

# Tariff order for Tenughat Vidyut Nigam Limited for FY 2005-06

**Jharkhand State Electricity Regulatory Commission (JSERC)**

## CHAPTER 6

### COMMISSION ANALYSIS

#### 6.1 Tariff Determination

The generation tariff for TVNL has been calculated by estimating fixed and variable charges separately. The fixed charges comprise of the following five components – Return on Equity, Interest on Loan Capital, Depreciation, Operation and Maintenance Expenses and Interest on Working Capital. The variable charges consist of the fuel costs (coal and oil).

#### 6.2 Total Generation and Sales

##### 6.2.1 Generation

The Commission has calculated total gross generation for FY 2005-06 as 2182.30 MU. This is based on the following –

- For Unit I: Actual generation till December 2005 has been considered and generation for the subsequent three months (January – March 2006) has been based on availability of 75%.
- For Unit II: The Commission has considered the fact that although Unit II was supposed to operational during FY 2004-05 and since the Unit was also not functional during the initial months of FY 2005-06. For the months of April – July 2005, no generation from this Unit have been considered. However, thereafter, i.e. from August – March 2006 generation from this Unit has been based on an availability of 75%.

Taking the above into account, the PLF has been worked out as 59.31%. The Commission has been considerate in allowing an availability of 75% for both Units of TVNL and directs TVNL to operate at a normative availability factor of 80% during FY 2006-07.

##### 6.2.2 Sales

The Commission is of the view that auxiliary consumption of 12% is high and it has decided to allow auxiliary consumption of 9% for the FY 2005-06 while computing Net Generation. Accordingly, the sales/net generation for 2005-06 has been calculated as 1985.89 MU.

### 6.3 Fixed Charges

The fixed charge consists of the following components

- 6.3.1 Interest on Loan Capital
- 6.3.2 Return on Equity
- 6.3.3 Depreciation
- 6.3.4 Operation and Maintenance Expenses
- 6.3.5 Interest on Working Capital

#### 6.3.1 Interest on Loan Capital

Loan repayment has two components – the principal repayment and the interest payment. For purposes of tariff calculation only the interest payment is taken into account.

TVNL has submitted that the loan amount outstanding as on March 31, 2005 is Rs.638.90 crores. The petitioner has claimed interest of Rs 46.18 Crore on a loan amount of Rs 354.2 Crore (after considering the conversion of Rs 306.7 Crore of debt into equity). The petitioner has sent a request to the state government for the conversion. However, since the conversion of debt into equity has not been approved as of now, the Commission will take into consideration the actual debt component (Bihar Government loan of Rs 608.9 Crore and Rs 30 Crore Jharkhand government loan) of Rs 638.9 Crore. The petitioner's claim for interest on an additional Rs 22 Crore to be taken from the Jharkhand government is not been taken into account as it is yet to be availed of.

Further, the petitioner has stated that the accrued interest on the Bihar and Jharkhand government loan amounts to Rs 957.47 Crore. The petitioner has stated that it has not been able to meet the repayment obligation, as there is a large outstanding payment of its customer Jharkhand State Electricity Board (JSEB). The petitioner has asked for the conversion of part of the accumulated interest of Rs 949.52 Crore into equity and waiver of the balance interest payable.

The Commission will only be considering interest on the original loan amount and not on the accumulated interest. The total loan amount is the sum of Bihar and Jharkhand government loan of Rs 608.9 Crore and Rs 30 Crore respectively. At an interest rate of 13% from the Government of Bihar and 13.25% for the Government of Jharkhand, the total interest payable has been computed as Rs 83.13 Crore.

The Commission had directed the petitioner in its last tariff order for FY 2004-05 to make efforts to reduce interest rate. The petitioner has stated in its petition for 2005-06 that it has requested the Government of Jharkhand to reduce interest rates. However no action on it has been taken so far.

### 6.3.2 Return on Equity

The return on equity has been determined at the rate of 14% per annum, based on norms. At present the Equity contribution in the TTPS (Stage I) is Rs. 100 Crores and the debt component of the project is Rs. 1255.58 Crores. Hence, the proportion of equity in the total project cost is 0.07. The petitioner has submitted a proposal to the State Government to raise the present equity of Rs 100 Crores to Rs 1100 Crores by converting the outstanding loan of Rs 608.90 Crores and part of the accumulated interest of Rs 949.52 Crores into equity (amounting to Rs 391 Crore approximately).

The petitioner has further stated that since the capital cost of the Project (Stage 1) is Rs 1355.58 Crores and in view of the 30% limitation on Equity portion, it proposes to claim Return on Equity on 30% of the Capital Cost – i.e. on Rs 406.7 Crore. TVNL has proposed return on equity of Rs 56.93 Crore estimated at the rate of 14% for the year 2005-06 on equity amount of Rs 406.70 Crore.

The proposal of conversion of Rs 306.7 Crore debt into equity has not been finalized. Therefore, the Commission for year 2005-06 will take into account the original equity amount of Rs 100 Crore. At a rate of return of 14%, the return on equity has been computed as Rs 14 Crore.

### 6.3.3 Depreciation

Depreciation is calculated on the historical cost of the asset. It is calculated on straight-line method over the useful life of the asset. Depreciation is allowed upto a maximum of 90% of the historical capital cost of the asset and the residual life of the asset shall be considered as 10%.

The petitioner has proposed a depreciation amount of Rs 43.69 Crore. The depreciation rates for each asset forming part of the gross block have been verified with the JSERC norms for depreciation. The aggregate amount of depreciation for the year 2005-06 has been computed as Rs 43.69 Crores. Therefore the Commission has approved the amount as proposed by the petitioner.

### 6.3.4 Operation and Maintenance (O&M) Expenses

As per the JSERC norms, O&M expenses for plants set prior to 1.04.2004 will be limited to 2.5 % of Capital Cost escalated at 6% per annum from the year of commissioning.

The O&M expenses for FY 2002-03 to FY 2005-06 are given in the Table below

**Table 18: O&M Expenses, FY 2002/ 03 – 2005/06**

	2002-03 (A)	2003-04 (A)	2004-05 (A)	2005-06

				(Proposed)
	Rs Crore	Rs Crore	Rs Crore	Rs Crore
O&M Expenses	85.56	92.38	59.01	59.33

The petitioner has claimed O&M expenses based on actuals at Rs 59.33 Crore. The Commission has computed O&M expenses as per the JSERC terms and conditions of generation tariff. The norms allow calculation of O&M expenses based on 2.5% of the project cost at the time of commissioning of the plant and an escalation of 6% every year thereafter. Taking the initial project cost as Rs 1355.58 Crore, the annual O&M expenses for 2005-06 have been computed as Rs 57.25 Crore. The Commission therefore approves O&M expense of Rs. 57.25 Crore for FY 2005-06.

### 6.3.5 Interest on working capital

The total working capital requirement consists of:

- (i) Cost of coal or lignite for 1.5 months for pit-head generating stations corresponding to the target availability
- (ii) Cost of secondary fuel oil for two months corresponding to the target availability; (JSERC norms have a requirement for only one month stock of secondary oil corresponding to target availability).
- (iii) Operation and Maintenance expenses for one month
- (iv) Maintenance spares @ 1% of the historical cost escalated @ 6% per annum from the date of commercial operation
- (v) Receivables equivalent to two months of fixed and variable charges for sale of electricity calculated on the target availability

The rate of interest on working capital is equal to the short term Prime Lending Rate of the State Bank of India on 1<sup>st</sup> April of the year for which the tariff is being determined.

#### 6.3.5.1 Cost of Coal

The Commission has considered station heat rate of 2500 kCal/ kWh (based on norms), calorific value of D grade coal as 4300 kCal/kg and the price of coal as Rs 1209.91 per tonne (based on the average actual monthly cost incurred by TVNL till December 2005). The cost of coal includes the actual average monthly expenditure on transportation. The cost of coal for one and a half months works out to Rs 18.90 crores. (These calculations have been described in detail later in the section on variable energy charge calculation.)

#### 6.3.5.2 Cost of Oil

The petitioner had proposed specific oil consumption of 4ml/kwh. The Commission has considered a specific oil consumption of 3.78 ml/kwh (based on an average of the actual monthly specific oil consumption incurred till December 2005). The petitioner has proposed the price of oil as Rs 22610.5 (a 10% escalation over last year's price of oil). The Commission examined that the price of oil has in fact gone up by 10% according to the WPI for 2004-05. It has therefore accepted the price proposed by the petitioner. As per the Commission's estimate, the cost of oil for a month has been computed as Rs 1.56 crores.

#### **6.3.5.3 O&M expenses**

The Commission has considered O&M expenses for TVNL during FY 2005-06 based on norms. The norms allow for 2.5% of the project cost at the time of commissioning of the plant and an escalation of 6% every year thereafter. Hence the annual O&M expenses for FY 2005-06 has been computed as Rs 57.25 crores and the expenses for 1 month have been calculated as Rs 4.77 crores.

#### **6.3.5.4 Maintenance Spares expenses**

The petitioner has proposed the maintenance spares expenses as Rs 11.707 crores.

As per Schedule 3 of TVNL's balance sheet the total plant and equipment cost is Rs 1170.81 crores and accordingly 1% of the same works out to be Rs 11.708 crores.

#### **6.3.5.5 Receivables**

The Commission based on the approved fixed and variable charges during FY 2004-05 and the sales of the ensuing year has estimated the cost of 2 months receivables as Rs 60.57 crores.

#### **6.3.5.6 Interest on working capital**

The petitioner has estimated the interest on working capital at 12.5%. The Commission has taken into consideration the sub PLR as per SBI (prevailing during April 1, 2005) of 10.5%. The interest on working capital details has been summarized in the table below.

**Table 19: Interest on Working Capital**

	<b>Proposed</b>	<b>Analysis</b>
<b>Total Working Capital (in Rs. Crores)</b>	<b>(2005-06)</b>	<b>(2005-06)</b>
Cost of coal for 1.5 months	22.99	18.90
Secondary fuel oil for 1 month	1.46	1.56
O&M expenses for 1 month	4.94	4.77
Maintenance Spares @1% of plant and equipment	11.707	11.708
Receivables equivalent to 2 months fixed and		

variable charges	70.22	60.57
Total Working Capital	111.32	97.50
Interest on working capital	13.91	10.24

The total fixed charge components and the sales approved by the Commission for FY 2005-06 has been summarized in the table below -

**Table 20: Fixed Charge Components**

<b>Components</b>	<b>Proposed (in Rs Crore)</b>	<b>Approved (in Rs Crore)</b>
Return on Equity	56.94	14
Interest payment on loan	46.25	83.13
O&M	59.33	57.26
Depreciation	43.69	43.69
Interest on working Capital	13.91	10.24
Total expenses	220.12	208.32
PLF	52.7%	59.31%
Sales (MU)	1705.6	1985.89
Auxiliary Consumption	12%	9%
Fixed Charge (Rs. per kWh)	1.29	1.05

#### **6.4 Variable Charges**

For computing energy charges (variable charges), the fuel cost viz. coal and oil consumption and cost details are taken into consideration.

##### **6.4.1 Cost of Coal**

TVNL had suggested a station heat rate of 2960 kcal/kwh. The Commission has decided to consider station heat rate of 2500 based on norms. TVNL uses Grade D coal and Gross Calorific value of Grade D coal can vary between 4200-4940 kCal/kg. Therefore the Commission has decided to accept the calorific value of coal as proposed by TVNL at 4300 kCal/kg.

TVNL in its petition for FY 2005-06 has proposed the cost of coal per tonne as Rs 1383.66 (a 10% increase over the cost in the previous year). The Commission verified the price of coal with Coal India Limited. The price of coal for 'D' Grade coal from CCL premier collieries is Rs 1040 per tonne. However this price is the basic price at the pithead. Also, within 'Grade D' category, TVNL may be using different qualities of coal and the actual amount of each quality used is not available. Therefore the Commission has decided to accept the prices made available by TVNL. i.e Rs 1209.91 per tonne (based on the actual average monthly cost incurred by TVNL till December 2005). This cost of coal of Rs 1209.91 per tonne includes an average Rs 151.09

as actual transportation charges. The Commission verified the transportation charges in the CCL region. The transportation charges for distances over 20 km are based on actuals. The TVNL plant is also situated more than 20 km away from the colliery. Therefore the Commission has decided to accept the actual transportation charges incurred by TVNL.

The petitioner had proposed a high figure for transit loss at 1.2%. The Commission has decided to accept a transit loss of 0.8% based on norms while calculating the actual consumption of coal.

#### 6.4.2 Cost of Oil

The Petitioner has proposed a specific oil consumption of oil at 4ml/kwh. The Commission has decided to consider specific oil consumption of 3.78 ml/kwh (based on an average of the actual monthly specific oil consumption incurred till December 2005). The petitioner has proposed the price of oil price as Rs 22610.5 (a 10% escalation over last year's price of oil). The Commission examined that the price of oil has in fact gone up by 10% according to the WPI for 2004-05. It has therefore accepted the price proposed by the petitioner.0

The details of the Variable Charge components approved by the Commission for FY 2005-06, has been summarized in the table below -

**Table 21: Energy Charge Components**

<b>Fuel Cost components</b>	<b>Proposed (Rs Crore)</b>	<b>Approved (Rs Crore)</b>
<b>Coal Cost components</b>		
Station Heat Rate	2960 kcal/kWh	2500
Calorific Value of coal	4300 kcal/kg	4300 kcal/kg
Transit Loss	1.2%	0.8%
Cost of Coal (per tonne) including transport cost	1383.65	1209.91
Cost of coal per unit	1.079	0.761
<b>Oil Cost components</b>		
Specific oil consumption	4 ml/kWh	3.8 ml/kWh
Cost of oil per KL	22610.5/KL	22610.5 KL
Cost of oil per unit	0.103	0.094
Total Fuel Cost (Rs/unit)	1.18	0.855

#### 6.5 Approved Tariff for TVNL

The Commission after a detailed analysis has approved a tariff of Rs 1.90 per unit, which is inclusive of a fixed charge of Rs 1.049 per unit and a variable charge of Rs 0.855 per unit.

