



Tenughat Vidyut Nigam Limited (TVNL)

(A Government of Jharkhand Undertaking)

Hinoo, Doranda, Ranchi-834 002

Annual Revenue Requirement

FY 2007-08

Submitted to

Jharkhand State Electricity Regulatory Commission (JSERC)

2nd Floor, Rajendra Jawan Bhawan-Cum Sainik Bazar
Main Road, Ranchi-834 001

6th July 2007

**BEFORE THE JHARKHAND STATE ELECTRICITY
REGULATORY COMMISSION**

Filing No: _____

Case No: _____

IN THE MATTER OF:

Petition/Application for approval of Tariff Revision for the financial year 2007-08, under Section 64 of the Electricity Act, 2003, read with Regulation 5 of the JSERC (Terms and Conditions for Determination of Thermal Generation Tariff) Regulations, 2004 issued by the Honourable Jharkhand State Electricity Regulatory Commission (JSERC), hereinafter referred to as Honourable Commission.

AND

IN THE MATTER OF:

Tenughat Vidyut Nigam Limited (“TVNL”)

Hinoo, Doraanda, Ranchi

Jharkhand – 834 002

.....**PETITIONER**

The Petitioner respectfully submits

Contents

1. Executive Summary	4
2. Background	7
1.1 Introduction.....	7
1.2 Need for the Petition	7
3. Generation Performance and Projection.....	9
2.1 Generation Performance	9
2.2 Plant Load Factor (PLF)	9
2.3 Auxiliary Consumption.....	10
2.4 Heat Rate.....	11
2.5 Specific Coal Consumption	12
2.6 Secondary Fuel Consumption	13
2.7 Summary	13
4. Fixed Charges.....	15
3.1 Capital Cost.....	15
3.2 Elements of Fixed Costs	16
3.3 Interest on Loan	16
3.4 Depreciation.....	17
3.5 Operation and Maintenance (O&M) Expenses.....	18
3.6 Return on Equity	21
3.7 Income Tax	22
3.8 Elements of Fixed Costs	22
5. Variable Charges	23
4.1 Coal Consumption	23
4.1 Coal Consumption	24
4.2 Specific Consumption of Oil	24
4.3 Fuel Prices and Costs	25
6. Revenue Requirement	27
5.1 Fixed Charges	27
5.2 Variable/Energy Charges	27
5.3 Other Income	27
5.4 Revenue Requirement & Proposed Tariff.....	27

1. Executive Summary

The Petitioner owns and operates an installed power generation capacity of 420 MW with two units of 210 MW each. Historically the generating units have been operating at much below their potential because of transmission constraints and frequent tripping of transmission lines. In addition JSEB has not been in a position to consume the power generated when both the units operate and the station is asked to back down. However, in 2006-07, the plant has shown an impressive performance that can be attributed to both the units being able to dispatch simultaneously.

Table 1 provides the performance of the generating units during the period 2000-2007.

Table 1: Generation Performance (MU)

Year	Generation (MUs)		Total	Station PLF (%)	Auxiliary Consumption (%)
	Unit -I	Unit-II			
2000-01	741	589	1330	36.11	16.09
2001-02	305	851	1156	31.39	15.79
2002-03	185	1183	1368	37.18	15.58
2003-04	616	731	1248	36.62	16.00
2004-05	1326	-	1326	36.04	17.60
2005-06	1240	289	1529	41.56	14.23
2006-07	1412	1303	2715	73.80	12.04

Based on last year's performance the Petitioner has projected the following for the FY 2007-08:

Table 2: Projected Generation Parameters for FY'07

Year	Generation (MU)	PLF (%)	Auxiliary Consumption (%)	Heat Rate (kCal/kWh)	Specific Coal Consumption (kCal/kg)	Specific Oil Consumption (kCal/kg)
2007-08	1679	45.6	12.00	2821	0.656	2.31

However, Unit I of plant recently suffered a major breakdown due to sudden load throw-off resulting in severe damage of all the moving and guide blades of the LP turbines and it is expected to be back in operation only in FY 2008-09. This has resulted in an increase in fixed charges for the Petitioner per unit of generation.

The fixed costs projected for the year 2007-08 are summarized below:

Table 3: Summary of Fixed Costs (Rs.Crores)

	Proposed for 2007-08
Interest on Loan	86.71
Depreciation	43.88
O&M Expenses	142.40
Interest on Working Capital	15.19
Return on Equity	14.00
Income Tax	-
Total	302.18

The cost of coal is billed by Central Coalfields Limited (CCL) at Rs.1097.89/MT and the transportation cost by road is Rs.160.85/MT. The delivered cost of coal at the thermal station was Rs.1258.73/MT during the FY 2006-07. Assuming a modest 5% increase in the cost of coal and transport the estimated cost per MT is considered at Rs.1321.67/MT for the year 2007-08.

The delivered cost of oil at the thermal station by the oil companies is Rs.27835/KL during the year 2006-07 as compared to Rs.20555/kl in 2004-05 registering an increase in prices at a CAGR of 16.4%. Assuming a modest 10% increase the oil price is estimated at Rs.30619/KL for the FY 2007-08.

Table 4: Summary of Variable Costs (Rs.Crores)

S.No	Item	Unit	2006-07 (Actual)	2007-08 (Proposed)
1	Coal Cost per Unit	Rs./kWh	0.948	0.995
	Oil Cost per Unit	Rs./kWh	0.073	0.080
2	Total Fuel Cost per Unit	Rs./kWh	1.021	1.075

The non-tariff income is estimated at Rs.116.96 lakhs during the FY 2006-07 and is projected to be Rs.117.30 lakhs for the FY 2007-08.

The sum of fixed and energy costs gives the total revenue requirement of the company for the FY 2005-06. The revenue requirement less other income will be the revenue to be raised through tariff. This has been worked out in the Table 5 below:

Table 5: Revenue Requirement

Particular	(Rs. crores)
Fixed Charges	302.18
Energy Charges	158.90
Revenue Requirement	461.08
Other Income	1.17
Revenue to be raised through Tariff in FY 2007	459.91

The Petitioner has estimated a revenue requirement of Rs.459.95 crores after adjusting for its non-tariff income and derived the following fixed and energy components of tariff:

Table 6: Proposed Tariff Increase

Tariff Component	Rs./kWh
Fixed Charges Proposed	1.80
Energy Charges Proposed	1.075
Tariff Proposed	2.875
Existing Tariff	1.90
Increase in Tariff requested	0.975

The Petitioner requests the Honourable Commission to approve the estimated Rs.0.975/kWh increase in its tariff.

2. Background

1.1 Introduction

Tenughat Vidyut Nigam Limited (hereinafter referred to as “Petitioner”), a wholly owned Generating Company of Government of Jharkhand was constituted in 1987 under Indian Company’s Act, 1956. The Petitioner owns and operates an installed power generation capacity of 420 MW with two units of 210 MW each. The units were commissioned as detailed below:

Unit I - September 1996

Unit II - September 1997

With the creation of Jharkhand state on 15th November 2000 from the erstwhile Bihar State, the Petitioner has become an undertaking of Government of Jharkhand. But all the papers relating to Tenughat Thermal Power Station (TTPS) are still lying with Bihar State Electricity Board, Patna and in spite of the orders of the Jharkhand High Court the documents are not made available to the Petitioner. As such the details of estimated costs of various items related to the project are not available with the Petitioner. However, based on expenditure details available with TTPS the total cost of the project including interest during construction (IDC) is estimated at Rs.1355.58 crores. This has been audited by Chartered Accountants. The Capital Cost of the project is discussed later in the petition.

1.2 Need for the Petition

The Honourable Commission has notified the regulations on Terms and Conditions for Determination of Thermal Generation Tariff on 28th July 2004 in exercise of the powers conferred by Section 61 and 62 read with Section 181 of the Electricity Act, 2003. The sub-clause (2) of Clause 5 of these regulations require the generating company, in case of existing generating station, to make an application for determination of tariff as per Appendix I to these regulations for getting the same approved by the Honourable Commission. In compliance to this provision, the Petitioner is filing this petition.

The Honourable Commission had passed tariff order dated 30th March 2006 for the financial year 2005-06 approving a tariff of Rs 1.90 per unit, which is inclusive fixed charges of Rs.1.049 per kWh and variable cost of Rs.0.855 kWh for the year 2006-07. The Petitioner seeks revision in tariff on account of breakdown maintenance and overhaul of one of its unit resulting in lower overall electricity generation, increase in new capital works and higher operation, repair and maintenance expenditure on account of aging of the existing units of the plant.

3. Generation Performance and Projection

2.1 Generation Performance

The Petitioner has existing generation facility of 420 MW (2x210 MW) coal based thermal power plant at Bokaro and is also envisaging a plan for extension of another three units (Stage II) of 210 MW each.

Table 1 provides the performance of the generating units during the period 2000-2007.

Table 7: Generation Performance (MU)

Year	Generation (MUs)		Total	Station PLF (%)	Auxiliary Consumption (%)
	Unit -I	Unit-II			
2000-01	741	589	1330	36.11	16.09
2001-02	305	851	1156	31.39	15.79
2002-03	185	1183	1368	37.18	15.58
2003-04	616	731	1248	36.62	16.00
2004-05	1326	-	1326	36.04	17.60
2005-06	1240	289	1529	41.56	14.23
2006-07	1412	1303	2715	73.80	12.04

2.2 Plant Load Factor (PLF)

Historically the generating units have been operating at much below their potential because of transmission constraints like frequent tripping of transmission lines. In addition JSEB has not been a position to consume the power generated when both the units operate and the station is asked to back down. Apart from this there are unit outages due to tube leakages etc. Due to the above the station PLF has been low.

Efforts have been and are being made to remove the constraints and improve the performance of the station. Efforts are also being made to sell the surplus power to others instead of backing down the units whenever JSEB does not require the power, especially, when both the units are being dispatched simultaneously. The PLF has increased to 73.8% in 2006-07 from the mid-30% levels during the years 2000-01 to 2004-05. This can be attributed to both the units being able to dispatch simultaneously. However, on

31.05.2007 Unit I of TTPS has suffered a major breakdown due to sudden load throw-off to 34 MW which resulted in severe damage of all the moving and guide blades of the LP turbines. BHEL has provided its observation on the LP turbine following the blade failure and has recommended appropriate maintenance and replacement operations to be conducted (Annexure 2). Unit I will therefore not be available during FY 2007-08 since major overhauling and operation and maintenance would be required to be undertaken. Therefore electricity generation would be available only from Unit II. The PLF and generation are therefore expected to drop for the plant in FY 2007-08 and the projections are given below in Table 8:

Table 8: Projected Generation Performance for FY'07

Year	Generation (MUs)	PLF (%)
2007-08	1679	45.6%

2.3 Auxiliary Consumption

The auxiliary consumption is specific to a particular power station and depends on its configuration, age and related technical parameters. Auxiliary power is required for different equipments like feed pumps, cooling water pumps, air fans, coal grinding mills, ash handling equipments, common auxiliaries etc. of the generating station. The Petitioner has taken many steps to keep the auxiliary consumption of its units at minimum level like testing and calibrating defective meters measuring auxiliary consumption and installing digital energy meter in the Petitioner's colony substation. As a result the auxiliary consumption has gone down to 12.04% in 2006-07 from 14.23% in 2005-06 and an average of 15.88% in the period 2000-2006.

Historically, the auxiliary consumption of the station had been high due to measuring of auxiliary consumption by defective meters and in addition the high auxiliary consumption included -

- Colony consumption.
- Other loads in the vicinity of the power station.
- Transmission losses of 220/6.6 kV Transformers.
- Only one generating unit is working at present.

The following measures have been taken to reduce the auxiliary consumption -

- Feeding station loads from the unit transformers (2x16 MVA) instead of station transformers (4x40 MVA).
- Metering the colony consumption and other loads fed from the station.
- Second generating unit coming to operation.

With the above measures it is estimated that the auxiliary consumption have come down to around 12.04% in 2006-07. The petitioner pleads the Honourable Commission to accept auxiliary consumption of 12% for the year 2007-08.

Table 9: Projected Auxiliary Consumption for FY'07

Year	Auxiliary Consumption (%)
2007-08	12.00

2.4 Heat Rate

The actual heat rate for the generating plant has been 2946 kCal/kWh and 2958 kCal/kWh for the years FY 2004-05 and FY 2005-06 respectively. However the Honourable Commission approved the normative 2500 kCal/kWh in its tariff orders for the two years. The all-India weighted average heat rate for plants as per the Central Electricity Authority's (CEA) Review of Performance of Thermal Power Stations (2005-06) has been 2788 kCal/kWh and 2747 kCal/kWh for FY 2004-05 and FY 2005-06 respectively and that for the Eastern region the average has been 3148 kCal/kWh and 2887 kCal/kWh for FY 2004-05 and FY 2005-06 respectively. The Petitioner therefore requests the Honourable Commission to take cognizance of ground realities as also observed by the CEA.

The actual heat rate observed in FY 2006-07 is 2821 kCal/kWh which is below the average for Eastern region coal based thermal power plants as observed by the CEA. The Petitioner therefore requests the Honourable Commission to consider the FY 2006-07 heat rate for the FY 2007-08.

Table 10: Projected Heat Rate for FY'07

Year	Heat Rate (kCal/kWh)
2007-08	2821

2.5 Specific Coal Consumption

The Petitioner sources D grade coal from the collieries of Central Coal Fields Limited with calorific value of about 4300 kCal/kg.

Table 11: Specific Coal Consumption

Year	Specific Coal Consumption (kg/kWh)
2000-01	0.705
2001-02	0.706
2002-03	0.695
2003-04	0.680
2004-05	0.685
2005-06	0.688
2006-07	0.656

The all-India average specific consumption of coal as per CEA's Review of Performance of Thermal Power Stations (2005-06) the all India for 2005-06 was 0.7 kg/kWh and for Eastern region as a whole it was 0.72 kg/kWh. However, the Honourable Commission approved only a normative specific consumption of coal of 0.56 kg/kWh which is far off from the realistic specific coal consumption observed in the country and the eastern region. Since the unit outages have reduced over the past two years and the station is achieving a higher PLF than in the past the specific consumption of coal has reduced to 0.656 kg/kWh in 2006-07 from 0.688 in 2005-06. This is still much below the national and eastern region average observed by the CEA. In 2007-08 specific coal consumption is expected to be remain at 0.656 kCal/kWh. The Petitioner requests the Honourable Commission to consider the actual specific coal consumption observed by the Petitioner in its generation plant.

Table 12: Projected Specific Coal Consumption for FY'07

Year	Specific Coal Consumption (%)
2007-08	0.656

2.6 Secondary Fuel Consumption

Due to the large number of outages experienced by the station due to transmission line trippings etc., the Petitioner has not been able to achieve the norm of 2 ml/kWh fixed by the Honourable Commission for specific oil consumption. The Petitioner had therefore proposed specific oil consumption of 4ml/kWh during FY 2005-06 against which Honourable Commission approved 3.78 ml/kWh finding merit in the Petitioner's request. The following Table 7 below provides the trend in specific oil consumption over the last 7 years.

Table 13: Specific Oil Consumption

Year	Specific Oil Consumption (ml/kWh)
2000-01	10.04
2001-02	11.25
2002-03	5.55
2003-04	8.17
2004-05	2.33
2005-06	3.39
2006-07	2.31

The Honourable Commission is well aware of the fact that the normative specific consumption is not possible to be achieved in a short time span given the ground realities the Petitioner faces, on the basis of which the Honourable Commission approved specific oil consumption of 3.78 ml/kWh for FY 2005-06. The delivered cost of oil at the thermal station by the oil companies has also increased to Rs. 27835/kl in FY 2006-07 from Rs.20555/kl in 2004-05 at a compounded annual growth rate (CAGR) of 16.4%. The Petitioner has however endeavored to reduce the specific oil consumption and has brought it down to 2.31 ml/kWh in FY 2006-07. The Petitioner shall endeavor to achieve stability in retaining it at that level and therefore requests the Honourable Commission to approve specific oil consumption at 2.31 ml/kWh for the FY 2007-08.

Table 14: Projected Specific Oil Consumption for FY'07

Year	Specific Coal Consumption (%)
2007-08	2.31

2.7 Summary

Based on last year's performance the Petitioner has projected the following for the FY 2007-08:

Table 15: Projected Generation Parameters for FY'07

Year	Generation (MU)	PLF (%)	Auxiliary Consumption (%)	Heat Rate (kCal/kWh)	Specific Coal Consumption (kCal/kg)	Specific Oil Consumption (kCal/kg)
2007-08	1679	45.6%	12.00	2821	0.656	2.31

4. Fixed Charges

3.1 Capital Cost

The station comprises of 2 units of 210 MW each, the first unit was commissioned in September 1996 and the second unit in September 1997. The actual expenditure incurred for completion of the project was Rs. 1355.58 crores.

The details of funding the project cost are given in Table 16 below:

Table 16: Capital Cost – Funding

S.No.	Funding Source	Amount (Rs. Crores)
Phase 1: 2x210 MW		
1	Equity Contribution by the erstwhile Government of Bihar	100.00
2	Bihar State Government Loan	608.90
3	Investment by BSEB	168.39
4	Loan from PFC	158.00
5	Interest during Construction.	320.29
6	Total for Phase 1	1355.58

The majority of the Phase 1 of the project was financed by the State Government while about Rs.158 crores (11.67 % of the funding) was financed by PFC. The entire loan obtained from PFC has been repaid completely along with interest. The outstanding loan is from State Government only. The Petitioner has requested the State Government to reduce the interest rate in view of the lower interest rates provided by banks. Response from the State Government is still awaited.

The Petitioner is also planning to extend (Phase 2) the existing generating project, by adding three new units of 210 MW each, the capital cost of which for the FY 2007-08 is estimated to be Rs.354 crores. This is the Phase 2 of the generating project which will be financed by a mix of debt in the form of funds from PFC and equity in the form of share capital contribution from Government of Jharkhand. It is expected to procure about Rs.284 crores from PFC and the remaining from the Government of Jharkhand.

3.2 Elements of Fixed Costs

The fixed costs include:

- Interest on Loan
- Depreciation
- O&M Costs
- Interest on Working Capital
- Return on Equity
- Tax on Income

The details are submitted below for consideration of Honourable Commission

3.3 Interest on Loan

The loan outstanding as on 31.03.2007 is Rs.665.9 crores. As per the terms and conditions the State Government loan is repayable in 15 equal installments. But the Petitioner could not meet the repayment obligation due to insufficient funds on account of non-payment of electricity charges by the Jharkhand State Electricity Board (JSEB).

Table 17: Loan Outstanding and Interest Charges (Rs.Crores)

S.No	Name of the Institution	Balance at the beginning of the year	Loan received during the year	Repayment During the year	Balance O/S at the end of the year	Rate of Interest %	Interest for the year
	2003-04						
1	Bihar Govt. Loan	608.90	-	-	608.90	13	79.16
	Jharkhand Govt. Loan	30.00	-	-	30.00	13.25	3.98
	Total 2003-04	638.90	-	-	638.90		83.14
	2004-05						
1	Bihar Govt. Loan	608.90	-	-	608.90	13	79.16
2	Jharkhand Govt. Loan	30.00	-	-	30.00	13.25	3.98
	Total 2004-05	638.90	-	-	638.90		83.14
	2005-06						
1	Bihar Govt. Loan	608.90	-	-	608.90	13	79.16
2	Jharkhand Govt. Loan	30.00	19.00	-	49.00	13.25	6.49
	Total 2005-06	638.90	19.00	-	657.90		85.65
	2006-07						

1	Bihar Govt. Loan	608.90		-	608.90	13	79.16
2	Jharkhand Govt. Loan	49.00	8.00	-	57.00	13.25	7.55
	Total 2006-07	657.90	8.00	-	665.90		86.71

The Petitioner received Rs.8 crores from the Government of Jharkhand towards construction of MGR system in 2006-07. The total loan outstanding as on 31.03.2007 is therefore Rs.665.9 crores and interest payable on loan is Rs. 86.71 crores. The Petitioner's inability to repay loan is due to non-recovery of dues from JSEB. Therefore the Petitioner requests the Honourable Commission to approve the interest charges for 2007-08.

Table 18: Loan Outstanding and Interest Charges for FY'07 (Rs.Crores)

S.No	Name of the Institution	Balance at the beginning of the year	Loan received during the year	Repayment During the year	Balance O/S at the end of the year	Rate of Interest %	Interest for the year
1	Bihar Govt. Loan	608.90		-	608.90	13	79.16
2	Jharkhand Govt. Loan	57.00	-	-	57.00	13.25	7.55
	Total 2007-08	657.90	-	-	665.90		86.71

3.4 Depreciation

The Petitioner has calculated the depreciation on its fixed assets on historical capital cost of the asset. Depreciation is calculated annually as per the straight line method as per rates of depreciation prescribed in the schedule attached at Appendix-II of the JSERC (Terms and Conditions for Determination of Thermal Generation Tariff) Regulations, 2004, and depreciation cost has been arrived at accordingly.

Table 19: Depreciation (Rs. Lakhs)

S.No	Asset Classification	Asset value at the beginning of 2006-07	Rate of depreciation (%)	Depreciation Amount (Rs.Cr.)
1	Land	3864.76		
	Buildings			
1	Factory Buildings	4210.34	3.6	151.57
2	Residential Buildings	2262.59	1.8	40.73
3	Non Residential Buildings	1709.31	1.8	30.77
	Roads			
1	Pucca Roads	1728.20	1.8	31.11

2	Boundary Wall & Others	267.78	1.8	4.82
Plant and Machinery				
1	Plant & Machinery	104244.61	3.6	3752.81
2	D.G. Set	216.16	6.0	12.97
3	Refrigeration	2.41	6.0	0.14
4	Internal Wiring	0.11	6.0	-
5	Overhead line	4295.14	3.6	154.62
6	Hydraulic works	7956.24	1.8	143.21
7	Tools and Tackles	26.42	3.6	0.95
8	Miscellaneous Equipment	61.54	6.0	3.69
9	Air Conditioners	31.57	18.0	5.68
10	Dozers	282.25	18.0	50.81
11	Computers	53.40	6.0	3.20
12	Furniture and Fixtures*	35.77	6.0	0.18
13	Office equipment*	22.27	6.0	0.77
14	Vehicles *	16.60	18.0	-
Total		130917.39		4388.05

* Depreciation applied only to newly purchased assets

As per the JSERC regulations, the residual life of an asset is considered as 10% and depreciation is allowed upto a maximum of 90% of the historical capital cost of the asset. Therefore, depreciation is not calculated on the assets where the cumulative depreciation has reached 90% of the historical cost of such assets. It is requested that the Honourable Commission may kindly approve the depreciation at Rs. 43.88 crores for the year 2007-08.

3.5 Operation and Maintenance (O&M) Expenses

The O&M expenses include expenditure incurred in the operation and maintenance of the generating station, including employee cost, repairs and maintenance, consumption of stores and spares, water charges, ash disposal, pollution control cess, insurance and other administrative and general expenses of the Petitioner corporate office at Ranchi. The maintenance expenditure has increased substantially due to the age of the plant and numerous outages experienced. In the previous tariff order for FY 2005-06 the Honourable Commission had approved the normative O&M expenses as per the JSERC (Terms and Conditions for Determination of Thermal Generation Tariff) Regulations,

2004 for plants set prior to 01.04.2004 that is 2.5% of the capital cost escalated at 6% per annum from the year of commissioning. The actual O&M expenditure for FY 2006-07 is estimated at Rs.86.26 crores. Using the normative approach, the O&M expenditure for the year 2007-08 will come to only Rs.65.36 whereas due to major breakdown maintenance and replacement expenditure in Unit I due to tripping of its turbine resulting in severe damage of blades, the Petitioner has projected an O&M expenditure of Rs.142.40 crores out of which approximately Rs.25-30 crores would be utilized in overhauling and repair and maintenance of Unit I. Unit I is expected to be under maintenance during FY 2007-08 since major works would be required to be undertaken. The Petitioner therefore requests the Honourable Commission to take consideration of the unit breakdown and accordingly make provision for O&M expenditure of Rs.142.40 crores for 2007-08.

Table 20: Proposed O&M Expenses

Year	O&M Expenses (Rs. Crores)
2007-08	142.40

The major components of the O&M expenses have been explained below:

a) Employee cost: The actual employee cost for FY 2006-07 was Rs.23.96 crores and for FY 2005-06 was Rs. 16.82 crores. The employee cost increases continuously on account of inflation, increment in salaries and wages, honorarium/incentives and increased demand for trained manpower on account of increased development in infrastructure sectors. For the year 2007-08 the employee cost is proposed at Rs. 27.90 crores.

b) Repairs and Maintenance (R&M): The Petitioner has to carry out regular repairs and maintenance of its generating plant to ensure maximum generation by optimum utilization of generating assets. The Petitioner undertakes preventive maintenance activities for all critical assets in addition to breakdown maintenance. The R&M expenses have been projected considering the past trends and anticipated repairs and maintenance. TVNL proposed Rs.2 crores for the FY 2005-06 as the R&M costs while the actual R&M cost was more than Rs.7.7 crores largely due to the R&M of P.H.Area (civil). The actual R&M costs in the year 2006-07 are estimated to be around Rs.3.11 crores on account of civil works in the non-residential buildings and power house road and drains. The budget estimate of the Petitioner for FY 2007-08 is Rs.1.73 crores. Other maintenance expenditure like preventive and general maintenance and store incidentals accounted for

about Rs.17.75 crores in FY 2006-07 and are projected to be Rs.22.80 crores in FY 2007-08. The Petitioner therefore requests the Honourable Commission to approve Rs.24.54 crores inclusive of R&M expenditure and other maintenance expenditures to keep its plant running since Unit I of the plant is undergoing major overhauling.

c) Administrative and General (A&G) Expenses: A&G expenditure represents cost of general administration such as rent, rates, taxes, legal expenses, professional fees, conveyance and traveling expenses, printing and stationery, bank charges, etc. The Petitioner had proposed an 8% increase in A&G expenses in FY 2005-06 over the expenses of 2004-05 while the actual growth was about 23.6%. In FY 2006-07 the A&G expenses were estimated to be Rs. Rs.7.31 crores against Rs.7.51 crores in FY 2005-06. The Petitioner proposes Rs.8.57 crores as A&G expenses for the year 2007-08.

d) Capital Maintenance: The Petitioner had incurred Rs. 86.82 crores towards capital maintenance during the last 5 years period, that is 2002-03 to 2006-07, including towards spares. These charges are being treated as deferred revenue expenses and proposed to be charged to revenue account in 5 annual installments. The year wise details of capital maintenance expenses and the amounts proposed to be charged to revenue account are detailed in the table below:

Table 21: Year wise Capital Maintenance Expenditure (Rs. Lakhs)

Year	Amount	Proposed to be charged to Revenue in 5 annual installments					
		2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
2002-03	886.45	177.29	177.29	177.29	177.29	177.29	-
2003-04	45.46	-	9.09	9.09	9.09	9.09	9.09
2004-05	1209.48	-	-	241.90	241.90	241.90	241.90
2005-06	3267.00	-	-	-	653.40	653.40	653.40
2006-07	2856.29	-	-	-	-	571.26	571.26
2007-08	5519.20	-	-	-	-	-	1103.84
Total		177.29	186.39	428.28	1081.68	1652.94	2579.49

The amount proposed to be charged during 2007-08 is Rs.25.79 crores.

e) Ash Disposal: Huge quantities of ash are piled up at the project site. TVNL has incurred an estimated cost of Rs.5.59 crores towards disposal of ash during the year 2006-07. For the year 2007-08 the Petitioner has projected expenditure of Rs.8 crores for disposal of ash from ash ponds, as it is essential to dispose off the piled up ash.

f) Interest on Working Capital: In accordance with clause (v) of Regulation 21 of the JSERC (Terms and Conditions for Determination of Thermal Generation Tariff) Regulations, 2004, working capital in case of coal based fired generation stations shall cover:

- Cost of coal for 1½ months for pithead generating stations and 2 months for non-pithead generating stations, corresponding to the target availability
- One month stock of secondary fuel oil
- O&M expenses for 1 month
- Maintenance spares @ 1% of plant and equipment cost as on 01.04.2004 or the date of commercial operation, whichever is later; and
- Receivables equivalent to 2 months of fixed and variable charges for sale of electricity calculated on target availability

As per the regulations, the rate of interest on working capital shall be on a normative basis and shall be equal to the short-term Prime Lending Rate of State Bank of India as on 1st April of the year for which the tariff is determined.

The interest on working capital worked out to Rs.16.87 crores for the year 2006-07 and it is estimated at Rs.15.19 crores for the year 2007-08 as detailed in the Table 22 below:

Table 22: Interest on Working Capital (Rs. Lakhs)

S.No	Particulars	2006-07 Actual	2007-08 Estimate
1	Cost of Coal for 1½ months	2831.18	1819.64
2	Secondary Fuel Oil for 1 month	145.41	98.96
3	Operation & Maintenance Expenses for 1 month	718.84	1186.70
4	Maintenance Spares @ 1% of Plant and Equipment	1187.72	1192.21
5	Receivables Equivalent to 2 Months of Fixed and Variable Charges	8615.98	7852.66
6	Total Working Capital	13499.13	12150.17
7	Interest on Working Capital @ 12.5%	1687.39	1518.77

3.6 Return on Equity

The capital cost of the TTPS (Phase I) comprising 2 units of 210MW each is Rs.1355.58 crores and the equity is only Rs.100 crores much less than the normative debt-equity ratio of 70:30 for the purpose of determination of tariff. 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. However no decision has been communicated by the Government to the Petitioner till now.

Petitioner shall intimate the Honourable Commission when such a decision is communicated by the State Government to the Petitioner. For now the Petitioner in accordance with Honourable Commission's decision in Tariff Order for FY 2005-06, seeks return on equity of Rs.14 crores at a rate of return of 14% on equity for FY 2007-08.

Table 23: Return on Equity (Rs.Crores)

Particular	Proposed for 2007-08 (Rs.Crores)
Equity	100.00
Return on Equity	14.00

3.7 Income Tax

There is no assessable income for Income tax purpose and hence no tax on income is proposed for the year 2007-08.

3.8 Elements of Fixed Costs

The fixed costs for the year 2007-08 are summarized below:

Table 24: Summary of Fixed Costs (Rs.Crores)

Particular	Proposed for 2007-08
Interest on Loan	86.71
Depreciation	43.88
O&M Expenses	142.40
Interest on Working Capital	15.19
Return on Equity	14.00
Income Tax	-
Total	302.18

The proposed fixed charges of Rs.302.18 crores and expected generation of 1679 MUs would result in a fixed tariff charge of Rs.1.80/kWh. The Petitioner requests the Honourable Commission to kindly approve this.

5. Variable Charges

4.1 Coal Consumption

The generating unit uses coal from the collieries of Central Coalfields Ltd. (CCL). The coal is transported through road over a distance of about 34 to 49 kms. The completion of MGR system to transport coal is delayed and efforts are being made to complete this as early as possible. The Petitioner received Rs.8 crores from the Government of Jharkhand towards construction of MGR system in 2006-07.

In the tariff order for the year FY 2004-05 and FY 2005-06, the Honourable Commission had allowed specific consumption of coal at 0.56 kg/kWh based on the normative heat rate of 2500 kcal/kWh, as per Honourable Commission's regulations on Terms and Conditions for Determination of Thermal Generation Tariff dtd. 28th July 2004 while the actual specific consumption of coal was 0.7 kg/kWh and 0.69 kg/kWh for FY 2004-05 and FY 2005-06 and heat rates were 2946 kCal/kWh and 2958 kCal/kWh for the two years respectively. The normative levels are far from the ground situations experienced by most plants in India. The normative level of heat rate may be applicable for the stations operating at high level of efficiency and high plant load factor. The all-India average specific consumption of coal as per CEA's Review of Performance of Thermal Power Stations (2005-06) the all India for FY 2005-06 was 0.7 kg/kWh and for Eastern region as a whole it was 0.72 kg/kWh. However, the Honourable Commission approved only a normative specific consumption of coal of 0.56 kg/kWh. TTPS is incurring heavy loss due to low specific consumption allowed by the Honourable Commission.

The Tenughat Thermal Power Station is operating under various constraints.

- Momentary outages due to tripping of transmission lines.
- Outages due to other reasons.
- Backing down of the units under instructions of JESB due to lack of load.

Due to the number of tripping of transmission lines and lack of load the generating units are backed down resulting in frequent shutting down and start ups. This impacts the fuel and plant efficiency adversely. The actual specific consumption of coal and heat rate were 0.656 kg/kWh and 2821 kCal/kWh even when PLF was comparatively higher in FY

2006-07. In FY 2007-08 due to breakdown maintenance of one unit the plant PLF will be much lower and the Petitioner expects at best to retain the lower level of specific coal consumption of 0.656 kg/kWh and heat rate of 2821 kCal/kWh of FY 2006-07. The Petitioner therefore requests the Honourable Commission to approve 0.656 kg/kWh as specific consumption of coal and heat rate 2821 kCal/kWh for the FY 2007-08.

The Petitioner requests the Honourable Commission to consider the actual heat rate observed by the Petitioner in its generation plant.

Table 25: Projected Specific Coal Consumption & Heat Rate for FY'07

Year	Specific Coal Consumption (%)	Heat Rate (kCal/kWh)
2007-08	0.656	2821

4.1 Coal Consumption

The transport of coal on a bumpy road in fully loaded trucks is resulting in loss of coal by spilling from the trucks. In addition, there is loss due to wind, evaporation of moisture, during rainy season the coal powder gets washed out. All these factors result in loss of coal in transport and storage. The coal is weighed at loading end and at receiving end, the difference accounts for loss in transit. The experience has shown that the loss accounts to about 1% of coal transported. However, the Honourable Commission approved only the normative 0.8% of coal transported. TVNL requests the Honourable Commission to allow 1% of total coal transported towards transit loss in FY 2007-08.

4.2 Specific Consumption of Oil

The specific consumption of secondary fuel (oil) during the last two years is given below:

Table 26: Specific Oil Consumption

Year	Specific Consumption (ml/kWh)
2005-06	3.90
2006-07	2.31

The station authorities had brought down the oil consumption considerably during FY 2006-07 to 2.31 ml/kWh from the 6 – 14 ml/kWh levels experienced during FY 2000-01 to FY 2003-04. The norm of 2.0 ml/kWh may be workable for a station working efficiently. It may be difficult to limit the oil consumption to 2.0 ml for a station like

TTPS with a numerous outages due to transmission line trippings, backing down of units, etc. However the Petitioner has taken initiative to reduce the specific oil consumption to 2.31 ml/kWh in FY 2006-07. The Petitioner shall endeavor to maintain specific oil consumption at FY 2006-07 level and requests the Honourable Commission to allow 2.31 ml/kWh during the FY 2007-08.

4.3 Fuel Prices and Costs

The cost of coal billed by CCL in FY 2006-07 was Rs.1097.89/MT and the transport cost by road is Rs.160.85/MT resulting in a delivered cost of coal at the thermal station at Rs.1258.73/MT. Assuming a modest 5% increase in the cost of coal and transport the estimated cost per MT is projected at Rs.1321.67/MT for the year 2007-08.

The delivered cost of oil at the thermal station by the oil companies is Rs.27835/KL during the year 2006-07 as compared to Rs.20555/kl in 2004-05 registering an increase in prices at a CAGR of 16.4%. Assuming a modest 10% increase the oil price is estimated at Rs.30619/KL for the year 2007-08.

The cost of coal and oil consumption based on the estimated prices for FY 2007-08 indicated above and the coal and consumption worked against the projected electricity generation results in an aggregate fuel cost of 158.90 crores for FY 2007-08 as detailed in the Table 27 below:

Table 27: Variable Cost

S.No	Item	Derivation	Unit	2006-07 (Actual)	2007-08 (Proposed)
1	Installed Capacity	IC	MW	420	210
	PLF	PLF	%	73.80%	50.34%
	Generation	$A = IC * PLF * 8.76$	MU	2715	1679
	Auxiliary Consumption	B	%	12.00%	12.00%
	Net Generation	$C = A * (1 - B)$	MU	2389.31	1477.52
2	Specific Coal Consumption	D	kg/kWh	0.656	0.656
	Total Coal Consumption	$E = A * D * 1000$	MT	1781571	1101424
	Total Consumption Including Transit Losses	$E'' = E * 1.01$	MT	1799387	1112438
	Delivered Coal Price	F	Rs./MT	1258.73	1321.67
	Total Coal Cost	$G = E * F$	Rs.lakhs	22649.42	14702.72
3	Specific Oil Consumption	H	ml/kWh	2.31	2.31
	Total Oil Consumption	$I = A * H$	Kl	6269	3878
	Delivered Oil Price	J	Rs./kl	27835	30618.50
	Total Oil Cost	$K = I * J$	Rs.lakhs	1744.98	1187.54

4	Coal Cost per Unit	$L = G/C$	Rs./kWh	0.948	0.995
	Oil Cost per Unit	$M = K/C$	Rs./kWh	0.073	0.080
5	Total Fuel Cost	$N = G+K$	Rs. lakhs	24394.40	15890.26
	Total Fuel Cost per Unit	$O = L+M$	Rs./kWh	1.021	1.075

The proposed variable/energy charges of Rs.158.90 crores and expected generation of 1679 MUs would result in a energy tariff charge of Rs.1.075/kWh for FY 2007-08. The Petitioner requests the Honourable Commission to kindly approve this.

6. Revenue Requirement

5.1 Fixed Charges

The aggregate fixed charges for the year amount to Rs.302.18 crores largely due to breakdown maintenance of one of the generating unit, higher operating, repair and maintenance costs due to the aging of the plant and repeated backing down of units and frequent tripping of transmission lines adversely impacting plant efficiency. The Petitioner therefore requests the Honourable Commission to approve the fixed charges at Rs.302.18 crores and fixed tariff charge at Rs.1.80/kWh for the FY 2007-08.

5.2 Variable/Energy Charges

The aggregate variable/energy charges computed for the year amount to Rs. 158.90 crores based on the normal escalation in fuel prices and actual specific fuel consumption resulting in energy tariff charge of Rs.1.075/kWh. Petitioner therefore requests the Honourable Commission to approve the variable/energy charges at Rs. 158.90 crores and energy tariff charge at Rs.1.075/kWh for the FY 2007-08.

5.3 Other Income

The non-tariff income includes miscellaneous receipts such as penalties, rent received, interest on investments, sale of scrap etc. The non-tariff income is estimated at Rs.116.96 lakhs during the FY 2006-07 and is projected to be Rs.117.30 lakhs for the FY 2007-08.

5.4 Revenue Requirement & Proposed Tariff

The sum of fixed and energy costs gives the total revenue requirement of the company for the FY 2007-08. The revenue requirement less other income will be the revenue to be raised through tariff.

Table 28: Revenue Requirement

Particular	(Rs. crores)
Fixed Charges	302.18
Energy Charges	158.90
Revenue Requirement	461.08
Other Income	1.17
Revenue to be raised through Tariff in FY 2007	459.91

The Petitioner has estimated a revenue requirement through tariffs of Rs.459.91 crores after adjusting for its non-tariff income and derived the following fixed and energy components of tariff:

Table 29: Proposed Tariff Increase

Tariff Component	Rs./kWh
Fixed Charges Proposed	1.80
Energy Charges Proposed	1.075
Tariff Proposed	2.875
Existing Tariff	1.90
Increase in Tariff requested	0.975

The Petitioner requests the Honourable Commission to approve the above modest Rs.0.975/kWh increase in its tariff.

Annexures

ANNEXURE I

FORM –1: Summary Sheet

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Region: Eastern, **State:** Jharkhand, **District:** Ranchi

Rs.Lakhs

S.No.	Particulars	Actual					Proposed	
		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1.1.	Depreciation (FORM-11)	5063.39	5068.4	5068.4	4365.29	4368.96	4377.45	4388.05
1.2	Interest on Loan (FORM-12)	11373.84	9438.85	8305.57	8319.51	8313.18	8564.93	8670.93
1.3	Return of Equity	1400	1400	1400	1400	1400.00	1400.00	1400.00
1.4	Advance against Depreciation (FORM-13)	-	-	-	-	-	-	-
1.5	Interest on Working Capital(FORM-14)	1321.48	1396.9	1475.38	1087.34	1015.16299	1687.39	1518.77
1.6	O & M Expenses (FORM-15)	4607.46	4883.91	5176.95	5487.56	5816.82	6165.83	6535.78
	Total	23766.17	22188.06	21426.30	20659.70	20914.12	22195.60	22513.53
	Less: Non Tariff Income	-	-	-	56.18	60.67	116.96	117.30
	Fixed Charges to be recovered	23766.17	22188.06	21426.30	20603.52	20853.45	22078.64	22396.23
2	Calculation Of Rate of Energy Charge (Rs./KWh)1	1.015	0.941	1.147	1.128	2.55	1.02	1.08
2.1	Rate of Energy Charge from Primary Fuel(REC)P2	0.803	0.838	0.974	1.07	1.66	0.948	1.00
	Net Energy Export (in MU)	973.32	1153.56	1131.53	1092.61	1529	2715	1679
2.2	Rate of Energy Charge from Secondary Fuel (REC)	0.212	0.103	0.173	0.058	0.89	0.07	0.08
2.3	Rate of Energy Charge ex-bus (REC) 3A, 3B, 3C							

1. Details of calculations, considering equity as per regulations, to be furnished

2. If multi-fuel is used simultaneously, give 2.1 in respect of every fuel individually

3A. The rate of energy charges shall be computed for open cycle operation and combined cycle operation separately incase of gas/liquid fuel fired plants.

3B. The total energy charge shall be worked out based on ex-bus energy scheduled to be sent out in case of plants covered by ABT, and ex-bus energy delivered sent out in case of plants not covered by ABT as the case may be.

3C. Any escalation in fuel cost to be considered for subsequent years or FPA to take care of the escalation.

*Includes interest on GPF

PETITIONER

FORM 2: Plant Characteristics

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Basic characteristics of the plant: Coal Based Plant with conventional steam generator

Fuel type: Coal

Details	Module number Or Unit number						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rate capacity (MW)	210	210					
Date of synchronization	Apr. 94	Oct. 96					
Capacity at the date of synchronization	210	210					
Date of entry into commercial operation	Sept. 96	Sept. 97					
Date of stabilisation	Sept. 96	Sept. 97					
Capacity at the date of stabilization	210	210					
Has any performance test been performed	No	Yes					
If yes, capacity at test (MW)	-	210					
Type of cooling system for condenser ³	Once through						
Type of Boiler Feed Pump ⁴	Motor driven						
Type of cooling system for electric generator ⁵	H ₂ cooling	H ₂ cooling					
Any other special feature ⁶							

Has the station received any notice or shut down the power station or penalty imposed for violation of any environmental standard by the Central / State Statutory Authorities: NO

If yes, furnish full details: N.A.

1. Describe the basic characteristics of the plant e.g. in the case of a coal based plant whether it is a conventional steam generator or circulating fluidized bed combustion generator or sub-critical once through steam generator etc.
2. Coal or natural gas or naphtha or lignite etc.
3. Closed circuit cooling, once through cooling, sea cooling etc
4. Motor driven, Steam turbine driven etc.
5. Air cooled, water cooled, hydrogen cooled etc.
6. Any special feature such as merry-go-round, scrubbers etc. Specify all such features

PETITIONER

FORM-3: Normative Parameters

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Particulars	Unit	Year Ending March	
		As notified by JSERC	
		2006-07	2007-08
	(1)	(2)	(3)
Target Availability	%	80	80
Normative PLF	%	80	80
Auxiliary Consumption	%	9.0	9.0
Station Heat Rate	kCal/kWh	2500	2500
Hours of Operation at Target Availability			
Hours of Operation at Target PLF Unit I / Unit II			
Specific Oil Consumption	ml/kWh	2.0	2.0
O & M charges (% of CC for plants less than 5 years old)	%	2.5%	2.5%
Based on actuals for plants more than 5 years	%	3.72%	4.36%
Coal Stock + Expense in months for Working Capital (WC)	MT	1.5	1.5
Oil stock in months for WC	KL	1	1
Spares stock for WC as % of Plant & Equipment	%	1	1
Receivables in Months for WC	Months	2	2
Rate of Return on Equity	%	14	14

CC - Capital Cost

WC - Working Capital

PETITIONER

FORM-6: Financial Package upto COD

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Project Cost as on COD¹ - Rs.1355.58 Crs.

Date of Commercial Opertion² - Unit # 1 : Sept. 1996, Unit # 2 : Sept. 1997

(1)	Financial Package as Approved		Financial Package as on COD		As Admitted on COD	
	Currency and Amount ³		Currency and Amount ³		Currency and Amount ³	
	(2)	(3)	(4)	(5)	(6)	(7)
Loan-I	Indian Re	608.89 Cr	Indian Re	608.89 Cr	Indian Re	608.89 Cr
Loan-II	Indian Re	158.00 Cr	Indian Re	158.00 Cr	Indian Re	158.00 Cr
Loan-III						
and so on						
Equity-						
Foreign	-	-	-	-	-	-
Domestic	Indian Re	100 Cr	Indian Re	100 Cr	Indian Re	100 Cr

1 Say US \$ 200m + Rs.400 Cr or Rs.1200 Cr including US \$ 200 m at an exchange rte of 1US \$= Rs.40/-

2. Date of Commercial Operation means Commercial Operation of the last unit

3 For example: US \$, 200 m etc.

PETITIONER

**FORM-7: Statement Giving Details of Project Specific Loans
(As on COD)**

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Particulars (1)	Package 1 (2)	Package 2 (3)	Package 3 (4)	Package 4 (5)	Package 5 (6)	Package 6 (7)
Source of Loan 2 1)	Govt. of Bihar					
2	P.F.C.					
Currency 3	Indian Re					
Amount of Loan	766.89 Cr					
Interest Type 4	Fixed					
Fixed Interest Rate, if applicable	13 %					
Base Rate, if Floating interest 5						
Margin, if Floating Interest 6						
Are there any Caps/Floor 7						
Moratorium Period 8	6 years on Govt. loan					
Moratorium effective from	01-4-88 on Govt. loan					
Repayment Period 9	21 years for Govt. loan					
Repayment Frequency 10	Yearly for Govt. loan monthly for P.F.C. loan					
Base Exchange Rate 11						
Date of Base Exchange Rate						

1. In case the project has been completed and any tariff notification(s) has already been issued in the past by GOI, the details in this form would pertain to loan package as on COD

2. Source of loan means the agency from who the loan has been taken such as WB., ABD, OECF, KWF, SBI, ICICI, IFC, PFC etc.

3. Currency refers to currency of loan such as US \$, dm, Yen, Indian Rupee etc.

4. Interest type means whether the interest is fixed or floating

5. Base rate means the base as PLF, LIBOR, etc. over which the margin is to be added

6. Margin means the points over and above the floating rate.

7. At times caps/floor are put at which the floating rates are frozen. If such a condition exists, specify the limits.

8. Moratorium period refers to the period during which loan servicing liability is not required.

9. Repayment period means the repayment of loan such as 7 years, 10 years, 25 years etc.

10. Repayment frequency means the interval at which the debt servicing is to be done such as monthly, quarterly half yearly, annual etc.

11. Base exchange rate means the exchange rate prevailing as on the date of COD

PETITIONER

**FORM-9: Statement of Additional Capitalisation after COD
(as on 31.03.1998)**

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

S.No.	Year	Work/Equipment added after COD (In Rs.)	Amount Capitalised/ Proposed to be capitalized (In Rs.)	Justification	Admitted cost
(1)	(2)	(3)	(4)	(5)	(6)
Closing	1997-98		15417600440		15417600440
1	1998-99	17931781	17931781		
2	1999-00	38254870	38254870		
3	2000-01	6114383	6114383		
4	2001-02	9339766	9339766		
5	2002-03	16997615	1431927		
6	2003-04	6393904	1561640		
7	2004-05	64498768	10773760		
8	2005-06	112743201	15607373		
9	2006-07	148892000	8853000		
10	2007-08	557650000	44900000		
	Total	978,816,288	15,572,368,940		15,417,600,440

1 In case the project has been completed and any tariff notification(s) has already been issued in the past by GOI, fill column 6 giving the cost as admitted for the purpose of tariff notification already issued by (Name of the authority) (Enclose copy of tariff order).

Note:

1. Fill the form in chronological order.

2. In case initial spares are purchased along with any equipment, then the cost of such spares should be indicated separately, e.g. Rotor - 50 Crs

Initial spares - 5 Crs

PETITIONER

FORM-11: Statement of Depreciation

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Financial Year (Starting from COD)	Depreciation on Capital Cost as on COD(In Rs)	Depreciation on Additional Capitalisation		Details of FERV	
		Amount of Additional Capitalisation (In Rs.)	Depreciation Amount (In Rs.)	Amount of FERV on which depreciation charged	Depreciation Amount (In Rs.)
(1)	(2)	(3)	(4)	(5)	(6)
1997-98	544330546				Details of depreciation given in Table – 5
1998-99		17931781			
1999-00		38254870			
2000-01		6114383			
2001-02		9339766			
2002-03		1431927			
2003-04		1561640			
2004-05		10773760			
2005-06		15607373			
2006-07		8853000			
2007-08		44900000			
	Total	154,768,500			

Note: Details of calculations to be furnished

PETITIONER

FORM-12: Statement Showing Computation of Interest on Various Loans

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

(1)	Particulars (2)	Loan 1				Loan-2				Total interest Due (11)	Total Repayment (12)
		Opening Balance (3)	Repayment (4)	Closing Balance (5)	Interest due (6)	Opening Balance (7)	Repayment (8)	Closing Balance (9)	Interest due (10)		
Year 1	Original Currency										
	Rs.										
Year 2	Original Currency										
	Rs.		Details are given in Table – 4								
Year 3	Original Currency										
	Rs.										
Year	Original Currency										
	Rs.										
Total	Original Currency										
	Rs.	665.89	-	665.89	86.71	158	158	-	-	86.71	752.60

Govt. of Bihar: Rs.608.89 cr.
 Govt. of Jharkhand: Rs.57.00 cr.
 Total: 665.89 cr.

PETITIONER

FORM-13: Statement of Advance Against Depreciation (AAD)

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

(In Rs.)

Year (1)	1/12 of the Original Scheduled Loan(s) (2)	Originally Scheduled Repayment the Loan(s) (3)	Min. of Col. (2) and (3) (4)	Depreciation during the year (5)	AAD1=(4) - (5) (6)
0-1	639075000	1917656000	639075000	506306241	132768759
1-2	639075000	1204256000	639075000	506338750	132736250
2-3	639075000	731888000	639075000	506840406	132234594
3-4	639075000	568898000	568898000	506840406	62057594
4-5	50740833	545405000	545405000	436529000	108876000
5-6	50740833	485405000	485405000	437687114	47717886
6-7	50740833	485405000	485405000	437745000	47660000
7-8	50740833	485405000	485405000	438805000	46600000
	Total		3031528000	3777091917	568673197

Note: 1 If the amount under the col (6) is negative, it will be shown as zero

(Rs. in Crores)

1. Loan received from Govt. of Bihar during the period from 87-88 to 98-99

708.89

Less: Loan transferred to Share Capital vide L.No.287 dt 4.3.92 of
Energy Dept. Govt. of Bihar

100

608.89

2. Loan taken from M/s.PFC during the period from 88-89 to 91-92

158

(This loan has been completely repaid as on 31.03.2003)

766.89

Note: Advance against Depreciation is not claimed since repayment is not made against State Government Loan.

PETITIONER

FORM-14: Statement of Calculation of Average Rate of Interest (CC) on Working Capital Loans

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

		Year ending March						
(1)	(2)	2001-02 (3)	2002-03 (4)	2003-04 (5)	2004-05 (Provisional) (6)	2005-06 (Actual) (7)	2006-07 (Estimate) (8)	2007-08 (Provisional) (9)
	INTEREST ON WORKING CAPITAL							
	Fuel Cost - 1 month	823.06	905.25	1081.50	1458.37	1616.61	2831.18	1819.64
	Fuel Stock - 1 or 1/2 month	651.24	805.98	918.58				
	Oil stock - 1 month	343.64	198.54	325.83	52.92	118.19	145.41	98.96
	O & M expenses - 1 month	686.08	708.80	765.65	477.69	347.65	718.84	1186.70
	Spares 1 year = 40% of O & M Less 1/5 th of initial capitalized spares for first 5 years	3293.18	3402.26	3675.12	1169.79	1186.83	1187.72	1192.21
	Receivables- 2 months	3641.96	3957.00	3771.76	5540.00	4852.03	8615.98	7852.66
	Total Working Capital (Rs. in lakh)	9439.16	9977.83	10538.44	8698.77	8121.30	13499.13	12150.17
	Working Capital Loan allowed							
	Weighted Average Interest Rate (14%)/ INTEREST ON WORKING CAPITAL@12.5% (Rs cr)	1321.48	1396.90	1475.38	1087.34	1015.16	1687.39	1518.77
SL.NO.	Source of Loan for Working Capital	AMOUNT (Rs.in Crs)	RATE OF INTEREST (Cash Credit) (%)					
(1)	(2)	(3)	(4)					
a								
b								
	TOTAL							
	Weighted Average Rate of Interest							

PETITIONER

FORM-15: Calculation of Operation and Maintenance Expenses

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Particular						Average	Base	Base	Tariff Period							
	95-96	96-97	97-98	98-99	99-00	95-96 to 99-00	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2006-07	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CASE I. O & M data available for 1995-96 to 1999-2000																
(Base O & M on the basis of actual data)																
A) Total O & M Expenses																
B) Abnormal O & expenses																
- On account of water charges																
- On account of other factors																
C) Calculation of Base O & M (A-B)							E	X=Ex(1.1)2	Xx 1.06	Xx (1.06)2	Xx (1.06)3	Xx (1.06)4	Xx(1.06)5	Xx(1.06)6	Xx(1.06)7	Xx(1.06)8
CASE II: Recent Plants for which O & M data for five year data for 1995-96 to 1999-2000 is not available and other new plants which come up during the tariff period																
Year of Commissioning																
Calculation of Base O & M 3								Y	Yx 1.06	Yx(1.06)2	Yx (1.06)3	Yx (1.06)4	Yx (1.06)5	Yx (1.06)6	Yx (1.06)7	Yx (1.06)8
								410062725	434666489	460746478	488391267	517694743	548756427	581681813	616582722	653577685

Notes:

1. Abnormal O & M expenses such as on account of sharp increase in water charges etc which are abnormal in nature and for which the utility shall file a separate petition

2. Base O & M(Y) = (0.025x Capital cost) escalated at the rate of 10 percent per annum after the year of commissioning to bring it to 1999-2000 level

For example if the capital cost of the plant commissioned in 1996-97 is Rs.100 crores then the base for 1999-2000 is computed as: Base O & M for 1999-2000 ('Y' in the format) = (0.025*100)*(1.10)3

Capital cost as on 31.03.1998 = 13555792566.49 - say 1355.8 Crores

Base O & M for 1999-2000 (in format) = (0.025x13555792566.49)x (1.10) 2 = 466382413

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FORM-16: Calculation of Operation and Maintenance Expenses

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

(Rs lakhs)

(1)	(2)	(3)	2001-02 (4)	2002-03 (5)	2003-04 (6)	2004-05 (7)	2005-06 (8)	2006-07 (9)	2007-08 (10)
(A)	Breakup of O& M expenses								
1	Employee cost (a)		840.06	871.63	1069.66	930.55	1004.99	1280.46	1414.3
	--do-(b) Pension & Gratuity		189.71	189.71	189.71	67.03	72.39	79.63	87.59
	-do-© Labour for O & M		398.00	440.65	549.00	559.61	604.38	1036.54	1288.65
2	Repair and Maintenance		30.88	45.95	148.26	88.65	200.00	490.75	365
3	Stores consumed		141.55	261.87	548.31	535.65	578.02	1393.02	1130
4	Power Charges		155.59	155.59	155.59	1.44	1.56	228	228
5	Water Charges		6116.63	6116.59	6115.20	2018.00	2000.00	2000	2000
6	Communication expenses					4.76	5.14	6	7.5
7	Traveling expenses					6.11	6.60	5	6
8	Insurance					147.13	148.00	148.07	150
9	Others					178.43	192.70	81.65	93
10	Pollution Control cess					288.00	288.00	25	30
11	Ash Disposal					53.86	58.17	559	800
12	Rent, Rates and Taxes.					4.28	4.62	2	3
13	Security expenses					205.71	222.17	300	350
14	Professional expenses (Admn. Exp.)		366.60	319.81	239.32	7.65	8.26	4.25	5
15	Printing and Stationery					9.55	10.31	4	5
16	Corporate office expenses allocation		44.45	154.37	223.27	197.55	230.10	250.26	332.96
17	Other Expenses (Deferred Revenue Expenses)					428.28	1081.68	1652.94	2579.49
18	Total (1 to 17)		8283.47	8556.17	9238.32	5732.24	6717.09	9546.57	10875.49
	LESS: RECOVERED (IF ANY)								
	NET Expenses		8283.47	8556.17	9238.32	5732.24	6717.09	9546.57	10875.49

Notes:

- | | | |
|---|----|--|
| 1. The process of allocation of corporate expenses to generating station should be specified | () | Details of Corporate Expenses of above 7 years not available |
| 2. An annual increase in O & M expenses under a given head (in excess of 20 percent should be explained) | () | |
| 3. The data should be certified by statutory auditors | () | |

(B)	Corporate office expenses								
	(aggregate)								
	- Direct employee expense	14.69	37.98	44.36	48.65	52.54	89.71	115.46	
	- Repair and maintenance				0.63	0.68	-	-	
	- Training and Recruitment	29.76	116.39	179.91	3.02	3.22	16.4	15	
	-Communication				5.58	6.03	8.44	10	
	-Traveling				18.67	20.16	10.66	20	
	- Security				2.36	2.55	2.83	3.5	
	- Rent, Rates and Taxes				10.82	11.69	13.6	15	
	- Others				107.82	133.18	108.68	108.68	

PETITIONER

FORM-17: Details /Information to be Submitted in respect of Fuel for Computation of Energy Charges

Name of the Company: Tenughat Vidyut Nigam Limited

Name of the Station: Tenughat Thermal Power Station

Month	Grade of Coal		For preceding	3rd Month			For preceding			2nd Month			For preceding			1st Month		
				"E"	"F"	"G"	"C"	"D"	"E"	"F"	"G"	"C"	"D"	"E"	"F"	"G"		
	Quantity of Coal / Lignite	(MMT)																
	Amount charged by the coal Co.	(Rs.)																
	Transportation by rail/ship/road	(Rs.)																
	Weighted average GCV of coal/Lignite for a grade	(kCal/Kg)	4300															
Unit price corresponding to the grade of coal charged by the Coal Co.	Base Price	(Rs/MT)	1097.81															
	Any other charge	(Rs/MT)																
	Royalty	(Rs/MT)																
	Cess or duty	(Rs/MT)																
	Sales Tax	(Rs/MT)																
	Transportation	(Rs/MT)		160.85														
	Total	(Rs/MT)		1258.73														
Transportation by rail/ship/road	Distance	(Km)	40															
	Amount	(Rs/Km/MT)																
		(Rs/MT)																

Note:

- 1.Furnish copies of relevant coal/lignite price notifications or the fuel supply agreement, tariff rates of Railways or other transport authorities as applicable
- 1.Similar details to be furnished for natural gas/ liquid fuel for CCGT station and secondary fuel oil for coal/lignite based thermal.

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