

A4: COMMISSION'S ANALYSIS OF THE PETITION FOR FY 2008-09

- 4.1 The Commission has scrutinized the petition filed by the petitioner for FY 2008-09. Component-wise details of the petitioner's submission and the Commission's analysis and approvals applicable for FY2008-09 have been discussed in this section.

Basis of Fuel Cost & Fixed Cost Determination

Petitioner's submission

- 4.2 The petitioner has submitted its proposal of energy and fixed charges as per the terms and conditions of the PPA signed between the petitioner and JSEB in 2005.

Commission's analysis

- 4.3 The PPA states that the applicable rate of sale of energy by the Petitioner to JSEB will be the rate as decided by JSERC at delivery point. The Commission has determined the tariff for FY 2008-09 in accordance with the 'Generation Tariff Regulations, 2004'.

Plant Load Factor (PLF)

Petitioner's submission

- 4.4 The petitioner has submitted a PLF of 60.43%. The petitioner stated that historically the generating units have operated at much below their potential because of transmission constraints like frequent tripping of transmission lines and in addition JSEB has not been in a position to consume the power generated from both the units and station was asked to back down. Apart from this, there were unit outages due to tube leakages etc.
- 4.5 The petitioner has also stated that there were managerial crisis in TVNL during the period in which breakdown of Unit-I took place. There was no Chairman for a period from Oct'2006 to November'2007 and also the post of MD was vacant for two and half months i.e. from Oct'2007 to December'2007. The new Board was formed in the month of Dec'2007. On the formation of new board, the managerial actions were taken and Unit-I was revived in June'2008. Since then Unit-I is running at a PLF of over 70%.

Commission's analysis

- 4.6 During determination of tariff for FY 2007-08, the petitioner had submitted a PLF of 48% caused due to the break down of Unit-I in May'2007. The Commission had directed the petitioner to take suitable measures to put the unit back in to operation as soon as possible.

- 4.7 The petitioner has been able to restore Unit-I back in to operation in June'2008 and hence been able to achieve a PLF of 60.43% in FY 2008-09, which is still less than the benchmark PLF of 80%, but better than the PLF in FY 2007-08. The Commission, given the past trend, would like to give some more time to these units to achieve the benchmark norms as fixed by JSERC.
- 4.8 Accordingly, the Commission considers the PLF of 60.43% submitted by the petitioner. However, the Commission directs the petitioner to take adequate and sustainable measures to further improve the PLF & availability of both the Units to bring it at par with the benchmark level by the end of FY 2011-12. Henceforth, the Commission will not consider PLF & availability lower than the benchmark value as prescribed in the 'Generation Tariff Regulations 2004' and amendments thereto.

Gross Generation

Petitioner's submission

- 4.9 The petitioner has submitted gross generation of 2223 MUs for the both the Units for FY 2008-09.

Commission's analysis

- 4.10 For determining gross generation, the Commission has taken into consideration the proposed values of PLF for both the Units and hence approves the gross generation of 2233 MUs for both the Units of TTPS for FY 2008-09.

Auxiliary Consumption

Petitioner's submission

- 4.11 The petitioner has stated that the auxiliary consumption 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 auxiliary consumption at minimum levels like testing and calibrating defective meters and installing digital energy meters in the colony substation. As a result of these measures, the auxiliary consumption has come down to 8.37% in FY 2008-09 from 9.95% in FY 2007-08

Commission's analysis

- 4.12 Auxiliary consumption refers to the quantum of energy generated that is used up within the plant during power generation process. More the auxiliary consumption lower will be the net generation. Since the auxiliary consumption specified in the petition for Unit I and Unit II is lower than that specified in the Regulations, the Commission approves the auxiliary consumption proposed by the petitioner which is 8.37% for both the Units of the petitioner.

Net Generation

Petitioner's submission

- 4.13 The petitioner has projected its net generation for FY 2008-09 to be 2037 MUs for both the Units, after taking into account the projections for gross generation and auxiliary consumption.

Commission's analysis

- 4.14 Since the Commission has approved the gross generation and auxiliary consumption proposed by the petitioner, the Commission also approves the net generation of 2037 MU for the two Units of Tenughat Power station.

Station Heat Rate (SHR)

Petitioner's submission

- 4.15 The petitioner has submitted a SHR of 3075 Kcal/Kwh. The petitioner stated that all-India average SHR for plants as per Central Electricity Authority's (CEA) 'Review of Performance of Thermal Power Stations (2007-08)' has been 2703 Kcal/Kwh and as complete report for the year 2007-08 is still not available, the average rate for Eastern region is not known.

Commission's analysis

- 4.16 The 'Generation Tariff Regulations, 2004' specifies the station heat rate of 2500 kcal/kWh during the post-stabilization period of coal-based generation stations with capacity between 200 MW and 500 MW. The station heat rate proposed by the petitioner is very high. In the previous tariff order for FY 2007-08 also, the Commission had approved a SHR of 2500 Kcal/Kwh. The Commission is not in agreement with the submissions of the petitioner for approving a higher SHR for FY 2009-10. The Commission approves a SHR as per the 'Generation Tariff Regulations, 2004' at 2500kcal/kWh for FY 2008-09 for both the Units.

Specific oil consumption

Petitioner's submission

- 4.17 The petitioner has submitted specific oil consumption of 2.78 ml/kWh for both the Units. The petitioner states that the norm of 2 ml/Kwh may be workable for a station working efficiently and it may be difficult to limit the oil consumption to 2.0 for a station like Tenughat TPS with numerous outages due to tripping of transmission lines, backing down of units, etc.

Commission's analysis

- 4.18 The specific oil consumption is the amount of secondary fuel (in ml) consumed in the process of generation of one unit power produced (in kWh). A lower specific oil consumption lowers the consumption of the secondary fuel in the generation process, and hence lowers the secondary fuel cost.
- 4.19 The 'Generation Tariff Regulations, 2004' specify a maximum secondary fuel consumption of 2.0 ml/kWh and the Commission does not find any suitable justification to approve the specific oil consumption at a level higher than the norms. The Commission thereby approves a specific oil consumption of 2ml/Kwh for FY 2008-09 for both the units.

Gross Calorific Value (GCV) of primary and secondary fuel

Petitioner's submission

- 4.20 The petitioner sources Grade D coal from the collieries of Central Coal Fields Limited which is having a calorific value of about 4300 Kcal/Kg. The GCV of secondary fuel is considered as 10000 kcal/kl.

Commission's analysis

- 4.21 Calorific value of a fuel refers to the amount of heat released on burning one unit of the fuel. Thus, a higher GCV indicates better quality of fuel and also lowers fuel cost, since it lowers the consumption of fuel needed for producing the requisite amount of energy.
- 4.22 The Petitioner uses Grade D coal and gross calorific value of grade 'D' coal ranges between 4200-4940 Kcal/Kg. Therefore, the Commission accepts the calorific value as proposed by the Petitioner at 4300 Kcal/Kg.
- 4.23 The proposed GCV of secondary fuel (10,000 kcal/kl) is accepted by the Commission.

Price of primary and secondary fuel

Petitioner's submission

- 4.24 The petitioner has taken the delivered cost of coal to be Rs. 1295.50 per MT and the delivered cost of secondary fuel as Rs. 39045/kilolitre.

Commission's analysis

- 4.25 Fuel price is an uncontrollable cost for the petitioner and thus the Commission is of the view that the actual rate of fuel paid by the petitioner should be accepted. Hence, the Commission approves the rates of coal and secondary fuel proposed by the petitioner for FY 2008-09 subject, however, to a subsequent true-up when the actual prices of coal and secondary oil for FY 2008-09 would be available.

Transit Loss*Petitioner's submission*

- 4.26 The petitioner has proposed 0.3% transit loss of coal. The transportation of coal on a bumpy road results in loss of coal by spilling from the trucks. In addition, there is loss due to wind, evaporation of moisture etc.

Commission's analysis

- 4.27 The normative transit and handling losses as a percentage of quantity of coal dispatched by the coal supply company as prescribed by JSERC is 0.3% for pithead generating stations. The Commission approves the figure given by the petitioner as 0.3% for FY 2008-09

Summary of Plant parameters & fuel cost determinants

- 4.28 The summary of plant parameters and fuel cost determinants for the two Units of Tenughat plant of the Petitioner submitted by the petitioner and approved by the Commission is given below:

Table 8- Plant parameters & Fuel cost determinants for FY 2008-09

Parameters	Unit	Unit I&II	
		Submitted by the Petitioner	Approved by JSERC
Capacity	MW	420	420
Plant Load Factor	%	60.43%	60.43%
Auxiliary Consumption	%	8.37%	8.37%
Station Heat Rate	Kcal/Kwh	3075	2500
GCV of Coal	Kcal/Kg	4300	4300
GCV of oil	Kcal/Kg	10,000	10,000
Specific oil consumption	ml/Kwh	2.78	2.0
Coal consumption including transit loss	MT	1594515	1286157

Oil consumption	Kl	6178.6	4446.7
Price of Coal	Rs/MT	1295.50	1295.50
Price of Oil	Rs/KL	39045.2	39045.2
Total Coal Cost	Rs. Cr	206.57	166.62
Total Oil cost	Rs. Cr	24.12	17.36
Net Fuel Cost	Rs. Cr	230.70	183.98
Energy Charges	Rs/Unit	1.132	0.90

Project Cost structure

Petitioner's submission

4.29 On being directed by the Commission to present additional information, the petitioner has submitted its annual accounts since from FY 1996-97.

Commission's analysis

4.30 On the perusal of annual accounts as submitted by the petitioner, the initial project cost of both the Units is derived at as Rs.1304.91 Cr. and taking into consideration the additional capitalisation during the intervening period the project cost during FY 2008-09 is presented in the table given below:

Table 9- Project cost structure for FY 2008-09

Item	Amount (Rs. Cr)
Project cost at start of 2008-09	1350.26
Additional capitalization in 2008-09	1.64
Total Project Cost	1351.90

Operation & Maintenance (O&M) Expenses

Petitioner's submission

4.31 The petitioner has submitted that the O&M expenses of the generating station include employee cost, repairs and maintenance, consumption of stores & spares, water charges, ash disposal, pollution control cess, insurance and other administrative and general expenses of the corporate office at Ranchi. The maintenance expenditure has increased substantially due to the age of the plant and numerous outages experienced.

4.32 The table below details the expenditure incurred by the petitioner on O&M Expenses:

Table 10-O & M Expenses for FY 2008-09

Particulars	Cost (Rs. Cr)
Employee Cost	15.32
A&G Expenses	10.59
R&M	11.26
O&M including Capital expenditure	46.85
Total	84.12

Commission's analysis

- 4.33 The Commission observes that the O&M expenses claimed by the petitioner are very high. The Commission has computed the O&M expenses as per the 'Generation Tariff Regulations, 2004' for plants set up before 01.04.2004, which states that the O&M should be 2.50% of the capital cost with an escalation @ 6% p.a.
- 4.34 The initial capital cost of both the units is as Rs.1304.91Cr. and additional capitalisation of Rs. 46.99 Cr. upto 31.3.2009.
- 4.35 Therefore, the Commission approves the aggregate O&M expenses of Rs.64.76 Cr. for FY 2008-09.

Depreciation*Petitioner's submission*

- 4.36 The petitioner has calculated the depreciation on historical capital cost of the assets. Depreciation is calculated annually as per the straight line method at the rates prescribed in the schedule attached in appendix-II of the JSERC (terms and conditions for determination of thermal generation tariff) Regulation, 2004. 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, the depreciation has not been calculated on the assets where the cumulative depreciation has reached 90% of the historical cost of the assets.

4.37 The depreciation expenses for the utility, submitted by the petitioner are as follows:

Table 11- Depreciation Expenses for FY 2008-09

Item	Depreciation Amount (Rs. Cr)
Depreciation for Plant	45.17
Depreciation for HO	0.11
Depreciation for Additional Capitalization	0.00
Total	45.28

4.38 The depreciation submitted by the petitioner for FY 2008-09 is Rs. 45.28 Cr for both the Units.

Commission's analysis

4.39 Depreciation is calculated on the historical cost of the asset at the straight-line method over the useful life of the asset. According to the 'Generation Tariff Regulations, 2004', depreciation is allowed up to a maximum of 90% of the historical cost of the asset.

4.40 The Commission has reviewed the depreciation costs proposed by the petitioner and found it in accordance with the 'Generation Tariff Regulations, 2004'. The Commission thereby approves the depreciation charges of Rs. 45.28 Cr for the two Units of Tenughat Power station for FY 2008-09.

Interest on Loan

Petitioner's submission

4.41 The petitioner has submitted that the loan outstanding as on 31.03.2009 is Rs. 638.90 Cr. This comprises of Rs 608.90 Cr loan from Bihar Government and Rs. 30 Crore loan from Jharkhand Government. As per the terms and conditions, the State Government loan is repayable in 15 equal instalments. As per the petitioner, it is not able to repay loan due to non-recovery of dues from JSEB. Therefore the petitioner requests the Commission to approve the interest charges of Rs. 83.06 Cr for FY 2008-09.

- 4.42 The table below summarises the outstanding loan and interest charge status for FY 2008-09:

Table 12- Details of the outstanding loan and interest payable

Name of the Institution	Balance at the beginning of the year	Loan received during the year	Repayment during the year	Balance outstanding at the end of the year	Rate of Interest (%)	Interest for the year
Bihar Govt. Loan	608.90	-	-	608.90	13	79.16
Jharkhand Govt. Loan	30.00	-	-	30.00	13	3.90
Total	638.90			638.90		83.06

Commission's analysis

- 4.43 The Commission allows the aggregate interest of Rs. 83.06 Cr for the existing debt components from long term loans.
- 4.44 Meanwhile, the Commission observes that the Petitioner is not repaying the loan due to their inability to collect dues from JSEB and had there been timely repayment of loans, the interest on account of the loan would have come down. The Commission further observes that the Petitioner has invested a large amount in fixed deposits and directs the Petitioner to explain why it is holding such huge amount in deposits and not repaying the loans to the lenders. **The Commission has given directives to the petitioner in this regard in directive section of this order.**

Interest on Working Capital

Petitioner's submission

- 4.45 In the tariff petition, petitioner has computed the Interest on Working Capital on the following basis:

Table 13- Interest on Working Capital

Particulars	Proposed for 2008-09 Rs. Cr
Cost of Coal for 1½ months	25.82
Secondary Fuel Oil for 1 month	2.01
Operation & Maintenance expenses for 1 month	7.01
Maintenance expenses @ 1% of Plant & Equipment	11.72
Receivables equivalent to 2 months of fixed and variable Charges	78.99
Total Working Capital	125.56
Interest on Working Capital @ 12.50%	15.70

4.46 The petitioner has considered the interest on Working Capital as 12.50%.

Commission's analysis

4.47 The rate of interest on working capital is taken to be the short-term Prime Lending Rate of State Bank of India as on 1st April of the year for which the tariff is determined.

4.48 The Working Capital requirement as per the 'Generation Regulations, 2004' includes:

- (a) Cost of coal for one month corresponding to target availability.
- (b) Cost of coal for ½ months for pit-head generating stations and one month for non-pithead generating stations, corresponding to the, "target availability".
- (c) One month stock for secondary fuel oil, corresponding to "target availability".
- (d) Operation & Maintenance expenses for one month.
- (e) Maintenance spares @ 1% of plant & equipment cost as on 01.04.2004 or the date of commercial operation, whichever is later, and
- (f) Receivables equivalent to two months of fixed and variable charges below the level of target availability shall be on pro-rata basis.

4.49 The calculation of interest on working capital is summarised below:

Table 14- Calculation of Working Capital as approved by the Commission

Particulars	Proposed for 2008-09 Rs. Cr
Cost of Coal for 1½ month	20.83
Secondary Fuel Oil for 1 month	1.45
Operation & Maintenance expenses for 1 month	5.40
Maintenance expenses @ 1% of Plant & Equipment	11.72
Receivables equivalent to 2 months of fixed and variable Charges	67.44
Total Working Capital	106.82
Interest on Working Capital @ 12.25%	13.09

4.50 The Commission has considered the interest on Working Capital as 12.25%, which is the short-term Prime Lending Rate of State Bank of India as on 1st April 2008. Accordingly, the Commission has computed and approved the interest on working capital to be Rs.13.09 Cr. for both the Units of the petitioner for FY 2008-09.

Return on Equity (RoE)

Petitioner's submission

- 4.51 The petitioner has submitted that for past so many years, it has been asking for return on its initial equity contribution of Rs.100 Cr. In FY 2007-08, the petitioner made a contract settlement and paid Rs. 38 Cr to M/s BHEL Limited. This amount was a part of the project cost but as it was not settled, the petitioner in the larger interest of consumers did not include the amount in project cost. Now, the petitioner has closed this contract and paid the required amount. It requests the Commission to accept the total amount as equity contribution as complete payment has been made through its reserves and no return or interest has been charged earlier.
- 4.52 The petitioner has also stated that its equity contribution is much lower than the capped percentage of 30% as investments made through its reserves has not been added in equity component.

Table 15-Calculation of Return on Equity (FY 2008-09)

Particulars	Proposed for 2008-09 Rs. Cr
Initial Equity at the time of CoD	100
Additional Capitalisation during FY 2008-09	38.036
Total equity	138.036
Return on Equity (%)	14%
Return on Equity	19.32

Commission's analysis

- 4.53 The Commission has calculated the return on initial equity based on the figure submitted by the petitioner and has considered a rate of 14% for calculating return on equity in accordance the "Generation Tariff Regulations,2004'.
- 4.54 The Commission has also considered the additional capitalisation of Rs.32.48 Cr. during FY 2007-08 and an additional capitalisation during FY2008-09 amounting to Rs.1.64 Cr., which is taken on pro-rata basis assuming mid-year as reference point.

- 4.55 Accordingly, the Commission has calculated and approved Rs.18.66 Cr as the RoE for the two Units for FY 2008-09.

Table 16-Calculation of return on equity by the Commission(Rs. Cr.)

Particulars	Proposed for 2008-09
Initial Equity at the start of FY 2008-09	132.48
Additional Capitalisation during FY 2008-09	1.64
Equity at the end of FY 2008-09	134.12
Return on Equity (%)	14%
Return on Equity	18.66

Non tariff Income

Petitioner's submission

- 4.56 The petitioner has estimated the non-tariff income as Rs.4.20 Cr. The petitioner has stated that the non tariff income includes miscellaneous receipts such as penalties, rent received, interest on investment, sale of scrap etc.

Commission's analysis

- 4.57 The Commission has accepted and approved the non-tariff income of Rs.4.20 Cr. as submitted by the petitioner.

Income Tax

Petitioner's submission

- 4.58 The petitioner has stated that there is no assessable income for Income tax purpose and hence no tax on income is proposed for the year 2008-09.

Commission's analysis

- 4.59 The Commission agrees with the petitioner. .

Summary of Fixed Cost determinants and Generation Tariff

- 4.60 The summary of Fixed cost determinants and Generation Tariff for the two Units of Tenughat thermal power plant as submitted by the petitioner and as approved by the Commission for FY 2008-09 is given below:

Table 17- Fixed cost determinants and Generation Tariff (FY2008-09) (Rs. Cr)

Parameters	Unit	Unit I&II	
		Submitted by the Petitioner	Approved by JSERC
O&M charges	Rs. Cr	84.12	64.76
Depreciation	Rs. Cr	45.28	45.28
Interest on Loan	Rs. Cr	83.06	83.06
Return on Equity	Rs. Cr	19.32	18.66
Interest on Working Capital	Rs. Cr	15.70	13.09
Total Fixed cost	Rs. Cr	247.48	224.84
Energy Cost	Rs. Cr	230.70	183.98
Total Expenses	Rs. Cr	478.18	408.82
Non-tariff Income	Rs. Cr	4.20	4.20
Net Total Expenses	Rs. Cr	473.99	404.63