

**CHHATTISGARH STATE ELECTRICITY REGULATORY COMMISSION
RAIPUR**

(Order passed on 15th June 2005)

SHRI S.K. MISRA
CHAIRMAN

**SHRI SARAT CHANDRA
MEMBER**

Petition No. 5/2005

IN THE MATTER OF

**Determination of Annual Revenue Requirement (ARR) and
Retail Supply Tariff FY 2005-06**

Chhattisgarh State Electricity Board, - Applicant
Daganiya, Raipur

**PETITION UNDER SECTION 62 OF ELECTRICITY ACT, 2003 AND CLASUE
31 OF C.S.E.R.C. (CONDUCT OF BUSINESS) REGULATIONS, 2004**

On behalf of CSEB : Shri V.K. Jain, Chief Engineer (Commercial), CSEB, Raipur and other officers.

Chhattisgarh State Electricity Regulatory Commission Raipur



CASE NO. 5/2005

PRESENT:

S.K. Misra, Chairman

Sarat Chandra, Member

IN THE MATTER OF:

Determination of Annual Revenue Requirement (ARR) and Retail Supply Tariff for FY 2005-06 based on the Tariff Application made by the Chhattisgarh State Electricity Board.

ORDER

(Passed this 15th Day of June, 2005)

This order deals with the application filed by the Chhattisgarh State Electricity Board (hereinafter called 'the CSEB' or 'the Board'), registered in the Chhattisgarh State Electricity Regulatory Commission (hereinafter referred to as the CSERC or the Commission) as petition No.5/2005, under section 45, 46 and 64 of the Electricity Act, 2003 (hereinafter called 'the Act') for determination of retail supply tariff for the financial year 2005-06 (FY 06) based on the revenue gap anticipated during the year. The Commission having heard the applicant, interveners, consumers and representatives of consumers, and after a series of formal interaction with the officers of the CSEB during March, April and May, 2005 and having considered the views expressed by the State Advisory Committee in its meeting held on 22.03.2005 and having considered all the documents filed with the application and filed subsequently by the CSEB and available on record, hereby accepts the aforesaid application with modifications, conditions and directions as herewith attached.

2. The Commission had a serious handicap while considering this application due to the lack of relevant operational information and data. There is no historic data available with the Board and although in operation more than four years, the Board is yet to build up a reliable management information system. The annual accounts of the Board have not been finalized for the FY 04 and FY 05, reportedly because of the delay in the division of assets and liabilities between the (erstwhile) MPEB and the CSEB. Under these circumstances the Commission had to rely on certain projections made by the Board and had to look into its performance in determining allowable costs for FY 06. The Commission has reassessed the annual revenue requirement (ARR) proposals wherever required, based on what it considered efficient and reasonable expenditure and anticipated income. The Commission has accordingly made some changes in the tariff proposals of CSEB based on the ARR as reassessed, and in the overall interest of rationalization of tariff. The Commission has also taken into account the cost norms laid down by the Central Electricity Regulatory Commission (CERC) in its regulations on terms and conditions of tariff.

3. The retail tariff order is based on the Commission's tariff philosophy which was circulated before the petition was taken up for consideration and takes into consideration the views expressed by all the stakeholders in their written objections/comments and in the public hearings conducted by the Commission.

4. The Commission in exercise of the powers vested under Section 45, 46 and 64 of the Act directs the applicant/petitioner to take immediate steps to implement the order after giving seven days public notice in accordance with the clause 31 of the CSERC (Details to be furnished by licensee or generating company for determination of tariff and manner of making application) Regulations, 2004. The revised tariff will be applicable with effect from 1st July, 2005 and the CSEB is directed to take all necessary steps for implementation of this tariff order so as to make it applicable with effect from that date.

5. This order shall remain in force till 31st March, 2006 or till the next tariff order of the Commission whichever is later. The Commission expects the applicant to comply with the directions given in the order and building an accurate database expeditiously and conduct necessary sample studies, especially to assess the AT&C losses, and come up with a more definitive tariff application for the coming financial year.

The Commission orders accordingly.

Sd/-

Member

Sd/-

Chairman

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Chapter 1 : Introduction

1.1 Background

This is the first tariff application submitted by the Board to the Commission. This is also the first application for determination of tariff under Section 62 and other charges under Section 45 and 46, of the Act considered by the Commission. The CSEB, which is deemed licensee in the State, is a vertically integrated power utility responsible for generation, transmission and distribution of electricity in the State of Chhattisgarh. It is yet to be restructured as per the mandate of the Act. Therefore, although the Board has submitted the ARR in a disaggregated form, according to functions, the Commission has looked at it in an integrated manner and has considered the retail tariff petition accordingly.

1.2 The Commission

The Chhattisgarh State Electricity Regulatory Commission was constituted by the Government of Chhattisgarh vide Notification No. 3190/S/E/2002 dated 23.08.2002 issued under the provisions of the Electricity Regulatory Commissions Act, 1998 read with Notification No.432/R-352/03 dated 11.05.2004. The Commission became operational on 01.07.2004 with the Chairman and the Member assuming office.

1.2.1 Functions of CSERC:

As per the provisions of Section 86 of the Act, the CSERC shall discharge inter alia the following functions: -

- (a) determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the State; provided that where open access has been permitted to a category of consumers under Section 42, the State Commission shall determine only the wheeling charges and surcharge thereon, if any, for the said category of consumers;
- (b) regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State.

This section mandates that “the State Commission shall ensure transparency while exercising its powers and discharging its functions.”

It further provides that: “In discharge of its functions, the State Commission shall be guided by the National Electricity Policy, National Electricity Plan and Tariff Policy published under section 3 of the Act.”
[Section 86 (4)]

1.2.2 Regulations and Guidelines issued by the Commission:

The Commission has issued the following regulations since its inception:

- i. CSERC (Conduct of Business) Regulations, 2004: These regulations were notified on 17.09.2004 and describe the legal and institutional set up under which Commission would function.
- ii. CSERC (Details to be furnished by licensee or generating company for determination of tariff and manner of making application) Regulations, 2004: These regulations were notified on 18.10.2004 for furnishing the details and manner for making application for determination of tariff for generating company and licensees.
- iii. CSERC (State Advisory Committee) Regulations, 2004: These regulations were notified on October 11, 2004 and provide for setting up of the State Advisory Committee to advise the Commission on policy matters relating to the electricity sector in the State.
- iv. CSERC (Redressal of Grievances of consumers and establishment of forums and Electricity Ombudsman) Regulations, 2004: These regulations were issued on February 15, 2005 providing guidelines to the licensees for setting up a comprehensive system to redress the consumer grievances including establishment of forums for redressal of consumer complaints and for appointment of electricity ombudsman.
- v. CSERC (Licence) Regulations, 2004: These were issued on December 7, 2004 and stipulate the procedure for issue of licenses for distribution, transmission and trading of electricity.
- vi. CSERC (Fees and Charges) Regulations, 2004: These were notified on 16/02/05 for fixing the fees and charges of the Commission.
- vii. Draft CSERC (Security Deposit) Regulations, 2005.
- viii. Draft CSERC (Appointment of Consultants) Regulations, 2005.
- ix. Draft Chhattisgarh Electricity Supply Code, 2005.
- x. Draft CSERC (Intra-State Open Access in Chhattisgarh) Regulations, 2005.

1.2.3 State Advisory Committee

The CSERC has constituted the State Advisory Committee in accordance with the provisions of Section 87 (1) of the Act vide notification No. 696/CSERC/Regu.3/2005 dated 25.02.2005. The Committee has 21 members representing licensees, consumers, industry, commerce, academic body, NGO, labour etc. The Chairperson of the Committee is Chairman, CSERC and Secretary, Department of Energy, Government of Chhattisgarh has been made a permanent invitee.

The Committee had its first meeting on 22.03.2005 during which, inter alia, a presentation on the tariff petition submitted by the Board was made and comments of the members were invited on the petition.

1.3 A brief note on CSEB:

The Chhattisgarh State Electricity Board came into existence on November 15, 2000 on bifurcation of the erstwhile State of Madhya Pradesh and the creation of the new State of Chhattisgarh. The Ministry of Power, Government of India, in pursuance of the provisions of Section 58(3) of the MP Re-organization Act, 2000, issued a provisional order on April 12, 2001 for allocation of assets, liabilities, etc. The final order regarding the transfer of assets and liabilities of MPEB to the two successor Boards, the MPSEB and the CSEB, has been issued by the Ministry of Power on November 4, 2004. According to this order, apportionment of assets, rights and liabilities of erstwhile MPEB has been made between the successor SEBs in the following manner:

- i. Assets: the fixed assets are divided on the basis of geographical nexus.
- ii. Liabilities: Long-term liabilities are divided in the ratio of fixed assets between MP and CG i.e. 90:10.
- iii. Security deposits from consumers are apportioned on the basis of location of consumers and the liability on account of electricity duty payable to State Government divided on the basis of the consumption of power.
- iv. Other current assets and liabilities: The apportionment of other current assets and liabilities has been done in the ratio of consumption of the power between the two States i.e. 77.03: 22.97.
- v. Allocation of staff, posts and staff related liabilities:
 - The posts and the staff would be allocated on the basis of recommendation of the Advisory Committee set up by the Ministry of Power vide order no. 42/8/2000-R&R (vol-V) B part dated 06.01.2004.
 - Staff related liabilities would be apportioned in accordance with order of the Ministry of Power no. 42/8/2000-R&R (vol-V) dated 06.01.2004.
- vi. The States shall have full right over the electricity generated by the generating stations allocated to the concerned State.

The ARR filed by the CSEB is based on the basis of division of assets and liabilities as above.

1.4 Power Scenario in the State:

The per capita annual consumption of power in Chhattisgarh is 678 kWh as against the national average of 592 kWh. The consumer density is low as the area of the State is large and the number of consumers is

less. The per capita consumption is somewhat better than the national average because of the preponderance of industrial consumption.

Out of the total 19,744 villages of the State 18,569 (94%) villages have been electrified (as on March 2004). In terms of rural households, out of a total of 33,59,078 households, 23,43,860 (70%) have been electrified (March 2004).

The CSEB, with an installed capacity of 1410 MWs and a consumer base of over 22 lakh, is the dominant player in the State electricity sector and it is likely to continue its dominant position for sometime. Other large producers of power in the State, such as Bhilai Steel Plant (BSP), BALCO, Jindal Power & Steel Ltd, etc., together have a capacity of 973.35 MW, but produce power mainly for captive consumption.

1.4.1 Demand and Supply Position in the State:

The following table shows the demand and availability of power in the State in the last two years and the projected demand and supply in 2005-06:

(MW)

	<i>2003-04</i>	<i>2004-05</i>	<i>2005-06 (Projected)</i>
<i>Demand at peak load</i>	1700	1785	1874
<i>Availability</i>	1322	1174	1180
<i>Deficit</i>	378	611	694

The demand of electricity in the State has been increased by almost 30% since the creation of the State mainly as a result of the encouragement given by the State Government to consumption of power in industrial as well as other sectors. Growth in demand was earlier limited by the lack of adequate T&D network.

The total capacity availability to the State is given below:

<i>Source</i>	<i>Capacity</i>
<i>CSEB</i>	1410.85 MW
<i>Central Allocation</i>	325 MW
<i>Availability from Captive plants</i>	120 MW
<i>Total Capacity available</i>	1855.85 MW

To meet the peak demand the Board purchases power from the energy traders over and above the Central sector power allocation.

The Board's generation capacity (as on 31.03.2005) is as under:

<i>Type of Generation</i>	<i>Capacity (MW)</i>	<i>% of total</i>
<i>Thermal</i>	1280.00	91%
<i>Hydel</i>	130.85	9%
Total	1410.85	100%

The present **thermal-hydel mix** is about **91:9**, as against a desirable mix of 60:40, showing the need to increase hydel capacity which will help in meeting peak demand.

In order to cater to the increasing demand in the system from own sources, the Board has taken initiatives to augment the generation capacity. The major works planned and in hand are as under:

Korba (East) Stage-5 (2x250MW) TPS: The work on the project is under progress. The first unit is expected to be commissioned by December, 2006 and the second in March, 2007.

Korba (West) Extn Stage-3 (2x250MW) TPS : Detailed Project Report as been prepared and tenders for the project are being called by the Board.

Energy generation

Gross energy generated by the Board in FY04 and estimated generation in FY05 is given below:

<i>Sr.No.</i>	<i>Details</i>	<i>FY04 (MU)</i>	<i>FY05 (MU)</i>
1	Korba East Phase II	995	1402
2	Korba East Phase III	1009	841
3	Korba West	5613	5298
4	Generation from Hydel stations	296	410
	TOTAL	7913	7951

The above generation is not enough to cater to the demand of the state. The CSEB purchases power from other sources to meet the demand.

The following is the statement of energy purchases made by the Board in FY05:

(FY05 Actual)

<i>Source</i>	<i>Units (MU)</i>
<i>Central Sector</i>	2617
<i>Captive and traders</i>	1487
<i>Overdrawl from Central Sector</i>	230
Total	4334

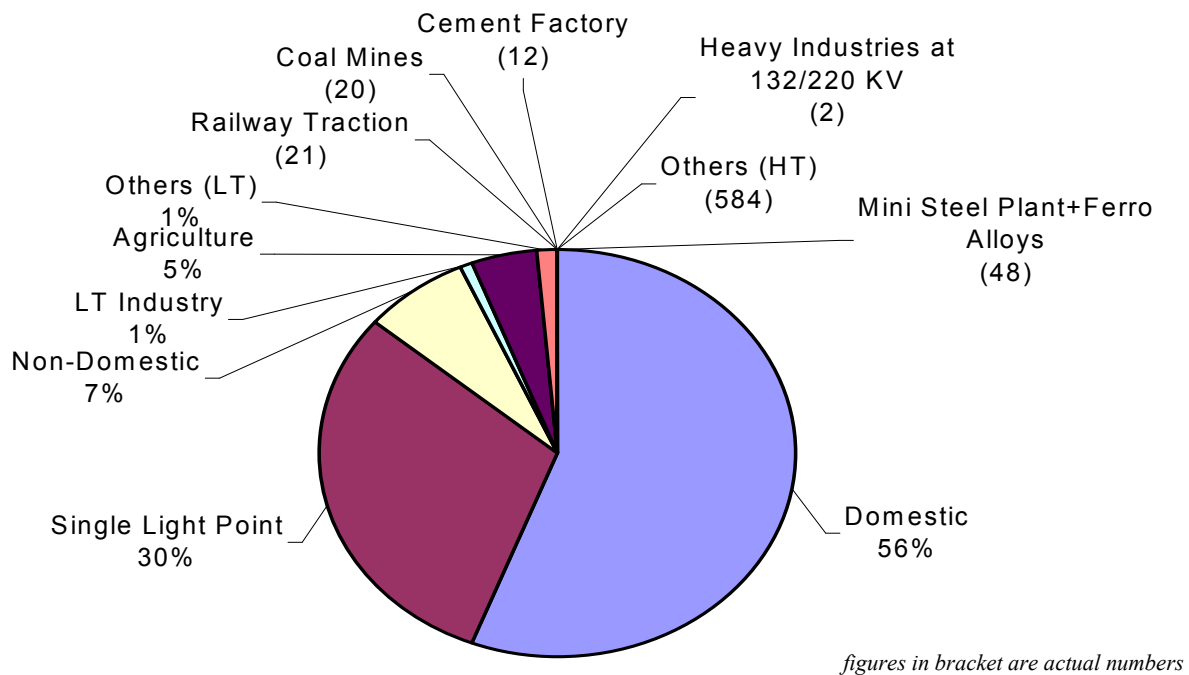
1.4.2 Consumer Profile:

The Board is supplying electricity to over 22.60 lakh consumers having a connected load of 1456 MW in LT category and 1456 MVA in HT category. The energy sold to these consumers was 7136.51 MUs in FY05.

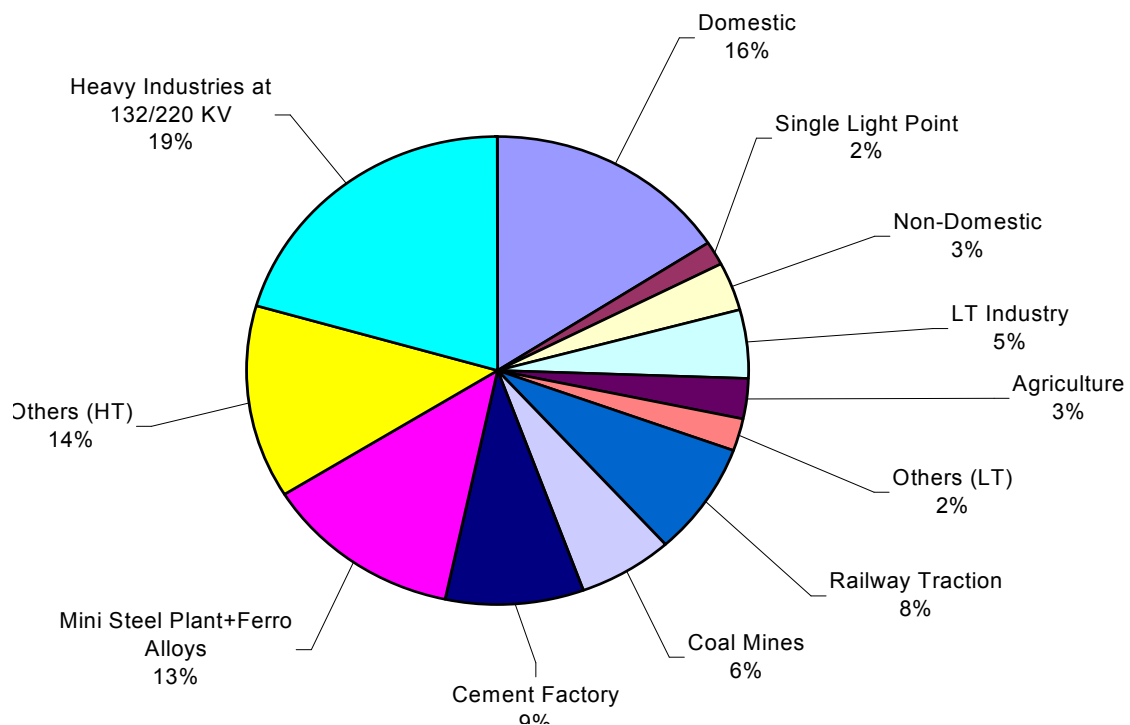
The details of category-wise number of consumers, their connected load and the sale of electricity in FY05 of the Board is given below:

<i>Category</i>	<i>Number ('000s)</i>	<i>Connected Load</i>	<i>Sales (MU)</i>
LT			
Domestic	1259	536	1131.88
SLP	686	33	123.56
Agricultural	104	310	202.84
Commercial	162	173	238.73
Industrial	20	313	326.88
Others	28	91	157.26
Total LT	2259	1456 MW	2181.15
HT			
Railway	0.021	224	554.18
Cement	0.012	108	638.23
Coal	0.020	91	427.93
Mini Steel Plants & Ferro Alloys	0.048	287	911.91
Heavy Industries	0.002	271	1458.08
Others	0.0584	382	965.03
Total HT	0.687	1363 MVA	4955.36
Total HT+LT	2259.69		7136.51

Category wise number of Consumers (FY 05)

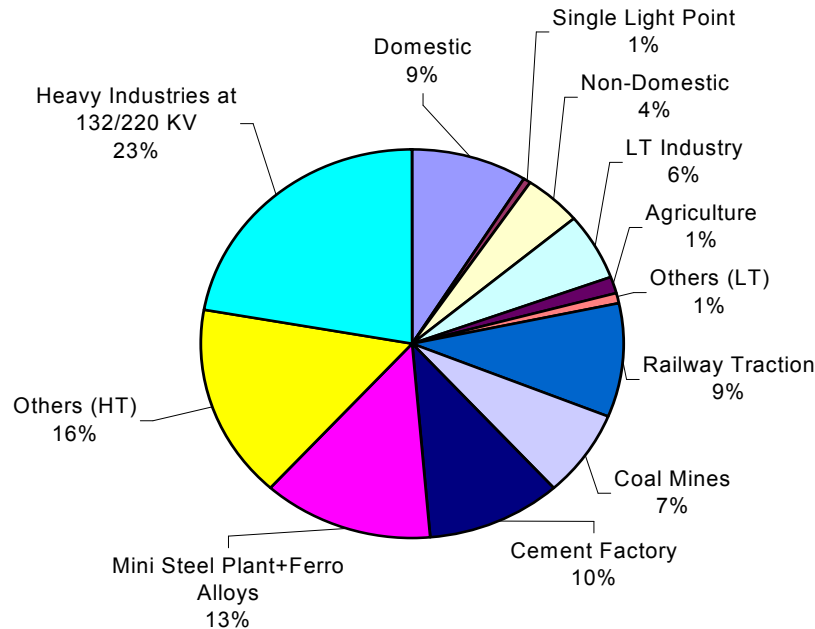


Consumer category wise percentage share of sales (FY05)



The ratio of HT to LT sales is 2.3:1, which is favourable and the CSEB is perhaps the only power utility in the country to have such a ratio.

Consumer category wise percentage share of revenue (FY05)



1.5 Reforms in the State Electricity Sector

The pace of power reforms in the State has been very slow for a variety of reasons. The CSEB is only four-and-a-half year old and came up soon after the new State Chhattisgarh came into being. It has suffered from the adverse effects of the division of assets and liabilities and of personnel of erstwhile MPEB. Lack of personnel at higher levels, particularly policy-making levels, in the Board, has to a large extent affected the reform process. The available personnel have been engaged mostly in the rapid expansion of the T&D network which was urgently required in the new State. The Board has inherited the procedures and practices of the erstwhile MPEB and these need to be changed in the interest of efficiency and economy in the light of the provisions of the Electricity Act.

1.5.1 Restructuring of Electricity Board

The State Government is yet to take a decision on the restructuring of CSEB in accordance with the provisions of the Act. Thus, the most significant provision of the Act is yet to be implemented. Certain preparatory steps have, however, been taken by the Board. The draft transfer scheme, the first step towards reorganization of the Board, has been prepared by the CSEB with the help of the consultant M/s Price

Waterhouse Coopers and submitted to the State Government. The Board has submitted that it is after the finalization of the future structure of the Board by the State Government, that the business plan and financial restructuring plan will be submitted to the Government. The CSEB is already engaged in the process of consultation with the staff. It has also engaged a consultant to interact with the employees and sensitize them about the need for reforms. The consultant has taken up of a diagnostic survey focused on assessing the level of awareness about electricity sector reforms. Based on such survey a strategy is proposed to be decided for sensitizing the employees about the reforms.

The GoI in pursuance of the provisions of Section 172 of the Act have agreed to the proposal of the State Government for extension of time for restructuring of the Board by six months upto 9th December, 2005. The Board now has to take urgent steps for restructuring.

1.5.2 Reforms in Distribution

The main reforms have to be initiated in the distribution sector. As the National Electricity Policy (Para 5.4.1) has so emphatically states: "Distribution is the most critical segment of the electricity business chain. The real challenge of reforms in the power sector lies in efficient management of the distribution sector".

Some efforts have been made by the Board to introduce reforms in this area although there is little progress in crucial areas like meterisation and loss reduction. Some of the steps are as under:

1.5.3 Refurbishment of old Thermal Plants

As mentioned in chapter 2, the Korba East 4x40MW and 2x120MW thermal power plants are very old. CSEB refurbished these plants in the last two years. This has improved their capacities by nearly 100MW and has improved Plant Load Factor (PLF) from 52% to 84%. CSEB is planning renovation and modernization of 4x120 MW units of Korba (West) for which the RLA study of these plants are being taken up. Based on the RLA study, the plans are to complete the refurbishment and modernization by the end of 11th plan i.e. FY 2012.

1.5.4 Strengthening of T&D Infrastructure

Immediately after the Board came into being, massive efforts were mounted to strengthen the T&D system which was weak in the new State. Since its inception, the Board has carried out the following works upto 31st March, 2005:

(a) EHV Sub-stations	-	17
(b) EHV lines	-	47 circuit kms.
(c) 33/11KV Sub-stations	-	178
(d) 33KV lines	-	2825 kms.
(e) 11/0.4KV Distribution substation	-	8898
(f) 11KV lines	-	5784 kms.

(g) LT lines	-	133446 kms.
(h) Capacitor Banks/(EHV Sub-station)	-	349 MVAR
(i) Capacitor Banks in Power Stations	-	26.9 MVAR

Considering the size of the T&D network in the year 2000 in the State, this has been a major achievement.

1.5.5 Metering of un-metered connection

The pace of meterization has been slow. Out of about 22.60 lakh electricity consumers in the State, the metered connections are only about 14.20 lakhs. Presently about 8.4 lakh single-light point (SLP) connections and agricultural connections are un-metered.

Out of the metered connections, the Board has replaced about 6 lakh old electro-mechanical meters by electronic/high precision meters. The process of conversion of all old meters by new ones is continued. The Board has informed that because of the use of electronic meters, there has been an improvement in energy consumption by about 10 to 15%.

The Board has asked for upto end of the March 2007 for cent percent meterization in the State, which has been approved by the Commission under Sec. 55(1) of the Act. There is a need for constant monitoring of both procurement and installation of meters.

1.5.6 Energy Audit

The CSEB has launched compulsory energy audit at all voltage levels. But energy auditing would be effective only when meters at all 33KV feeders/points and 11KV feeders/points are installed. Presently out of 910, 33KV feeders and 1737, 11KV feeders, meters at only 354 and 1111 feeders respectively have been installed. The Board has assured the Commission that meters at the balance feeders would be provided by December, 2005. Energy audit upto Distribution Centre level is also to be undertaken.

1.5.7 DTR metering

Similarly, Distribution Transformer (DTR) meters, which is so vital to detect theft/pilferage on LT side, are yet to be installed in a big way. Out of 39,000 distribution transformers in the State, only 700 have DTR meters.

1.5.8 Consumer indexing

The Board has taken up the task of consumer indexing, which it hopes to complete in the next two years. This would be an important step not only in serving the consumers better, but also in better billing and collection.

1.5.9 Machinery for redressal of consumer grievances

It is unfortunate that the Board is yet to take steps to institute an effective machinery for redressal of consumer grievances. The Commission has issued detailed instructions in this regard in a separate regulation, viz CSERC (Redressal of Grievances of consumers and establishment of forums and Electricity Ombudsman) Regulations, 2004, issued on February 15, 2005. The regulations envisaged a three-tier system for redressal of consumer grievances. The first is the internal grievance redressal machinery, which is internal in the Board. The proposal of the Board has been approved by the Commission but no action has so far been taken to set up consumer forums, which is the next stage of grievance redressal machinery. This has led to delay in the appointment of Ombudsman by the Commission. The Board has to take urgent action in this regard. The Board has also advised to establish Call Centres at Raipur, Bilaspur and Durg providing an efficient round the clock complaints' handling machinery, but action is yet to be taken.

1.6 Brief History of Tariff Filing:

- 1.6.1** The Board submitted an application for approval of Annual Revenue Requirement for FY 2005-06 (ARR Petition) on 31st January, 2005 for revision of its retail tariff and fixation of wheeling and miscellaneous charges as required under Section 64 of the Act and Clause 31 of the Chhattisgarh State Electricity Regulatory Commission (Conduct of Business) Regulations, 2004.

The Commission scrutinized the application and during scrutiny, certain discrepancies were observed and communicated to the Board vide letters dated 5th February, 2005 and 8th February, 2005 with a directive that the application may be revised by 14th February, 2005. The Board sought extension of time upto 28th February, 2005 which was allowed by the Commission.

The main observations made by the Commission on this application were as follows:

- i. The tariff petition was made separately for generation, transmission and distribution while the Board continued to work as vertically integrated utility.
- ii. The Board indicated huge market borrowings although it has surplus funds in short term fixed deposits.
- iii. The Repair and Maintenance expenditure was taken as 11% of gross fixed assets resulting in substantial increase over the previous year's.
- iv. The plant utilization factor was considered at a lower level even after refurbishment of units of Korba (East).

- v. The fuel cost for FY 05-06 was escalated by 10%, while at the same time the Board had proposed a variable cost adjustment formula.
- vi. The Board had taken lower load factor and negative growth for Cement and Ferro Alloy Industries in FY 06 as compared to FY 05.
- vii. Details of Projects / Schemes on which the Board has incurred the expenditure was not given for FY 05 and FY 06.

1.6.2 The Board filed revised petition on 01.03.2005 with necessary changes and replies and additional information to specific queries raised by the Commission. The Board stated that the petition has been filed for generation, transmission and distribution as separate entities as the State Government had taken a decision to restructure the Board and form separate companies for generation, transmission and distribution. As the State Government has extended the deadline for reorganization to December 10, 2005 in consultation with the Central Government, the Board pleaded that it had done a lot of groundwork on evaluating various feasible industry structures and was confident that restructuring would be done before December 10, 2005. In the meantime, the Board has decided not to delay the filing of ARR and Tariff application for 2005-06 was filed assuming generation, transmission and distribution as separate business entities.

The Commission scrutinized the petition submitted by the Board and the following major discrepancies were observed:

- i. High interest costs due to market borrowings while there were large investments in fixed deposits.
- ii. The details of capital work done during the year were not given.
- iii. The fuel cost was inflated by 10% and at the same time the variable cost adjustment formula was also proposed.

In a nutshell, the major discrepancies pointed out by the Commission earlier were more or less not removed and the Board had only tried to justify the same.

However, inspite of the above shortcomings, it was decided by the Commission to admit the petition to avoid further delay in determination of tariff for the year 2005-06. It was decided that the Board would submit additional information as required by the Commission. The tariff petition was registered by the Commission on 11.03.2005.

1.6.3 A brief of the ARR and tariff application was published in the following newspapers having wide circulation in the State on 13.3.2005:

- Dainik Bhaskar
- Nav Bharat

- Hitavada
- Hari Bhumi, Bilaspur

The copies of the Board's petition and its summary in Hindi, were made available for study to members of the public in the Board's offices and on the Commission's and the Board's website and also for sale. The last date for filing of written objections was 28.03.2005, which was further extended to 03.04.2005 on public request. Thus a period of 21 days was allowed to the public to file their objections to the application. However, the Commission relaxed even this time limit and agreed to accept objections and comments till the date of public hearing and in the public hearing itself.

The Commission held the technical validation session from 09.03.2005 to 11.03.2005 with the Board. During the validation exercise a lot of discrepancy in the data were found and the Board was advised to furnish the following additional information to the Commission:

- CWIP details for all the three years with scheme-wise details of Project Cost, Commissioning Date, Opening Balance, additions during the year, transfer to Fixed Assets and Closing Balance.
- Actual details of outstanding loans and market borrowings as on date including terms like interest rate (effective, net of any AG&SP benefit, etc.), repayment terms, prepayment clauses, if any, etc., Status of Investments as on date.
- Details of actual Repairs and Maintenance expenditure incurred in the current year on generation, transmission and distribution assets.
- RoE may be recalculated on the basis of opening balance of net-worth.
- Capitalization of other expenses on rational basis.
- Reasons for a Budget provision of Rs.191 Crore to Government of Chhattisgarh.
- Details of Capital Subsidy and Grants that has been converted to Equity. Nature of subsidy, amount received, date of receipt and contributing party.
- Details of power purchase from other sources at Rs.2.97 per unit. Basis of arriving at this figure.
- Details of Station Supply Cost of Rs. 33 Crore in the ensuing year. Figures for the previous year and the current year.
- To work out Availability Factor for Transmission assets.
- GCV of coal on 'as received' and 'as fired' basis in Korba (East). Chemical Analysis report of coal for Korba (East).
- Energy Balance to be reworked to reflect correct position.
- Cross-Subsidy for ensuing year to be reworked correctly.

Even after reminder, the Board did not provide some of the information sought by the Commission viz. availability factor for transmission assets and CWIP. The Commission decided to proceed ahead on the basis of available data to finalize the ARR.

1.7 Public Hearing:

Determination of tariff, which affects all consumers, needs also to be done in a transparent manner which provides adequate opportunity to all stakeholders to have their say. Section 64 (3) of the Act mandates the Commission to consider all suggestions and objections received from the public before issuing the tariff order on the petition filed by the licensee. Accordingly, the Commission held public hearings at six places and a notice for public hearing was published in the following leading newspapers of the State on 02.04.2005 (in both Hindi and English):

- Navbharat
- Dainik Bhaskar
- Hari Bhumi, Bilaspur
- Hitavad (English)

Public hearing was held at following places on the dates as mentioned in the table:

	<i>Place</i>	<i>Date</i>
1.	Bilaspur	5.04.2005
2.	Ambikapur	6.04.2005
3.	Korba	7.04.2005
4.	Jagadalpur	11.04.2005
5.	Raipur	13.04.2005
6.	Bhilai	15.04.2005

In the public hearing, consumers of all categories raised various issues/ objections/ comments on the tariff petition filed by the Board. These issues have been dealt in Chapter 4 (Public Objections/ Suggestions). The Commission asked the Board to give its response on all the issues raised during public hearing and has formulated its own views on all the issues raised.

1.8 Additional filing by the Board:

In view of certain developments, which had a serious and direct bearing on its operations, the Board submitted additional filing on ARR on May 6, 2005. In the meantime, the Government of India withdrew 90 MW power from the un-allocated Central pool on May 2, 2005, because of which the Board had to revise its power purchase costs. Secondly, by this time the

additional pension contribution, which was not projected earlier, has now become necessary. The main changes envisaged in the ARR in the revised filing were as follows:

- The Board revised demand forecast within the State for FY06 by assuming 6% rise in the consumption over FY05 as per the earlier estimate and 19% rise in demand over that of FY05.
- The CEA informed the Board on May 2, 2005 that its unallocated central sector allocation is reduced from 8% to 3% in Western Region and from 47MW to nil in the unallocated quota of NTPC stations in Eastern Region. This has resulted in reduction of 90MW power available to the Board.
- Power purchase cost was hiked by 74% in revised ARR from Rs.949.3 Crore to Rs. 1653.6 Crore.
- The Board also revised its estimated T&D losses in FY05 from 38.96% to 40.65% in FY05 and increased the projected T&D losses in FY06 from 37.66% to 38.71%.
- It also raised the export of power from the State to GEB in FY06 from 100 MU to 648 MU.
- The employee cost was raised by Rs. 84 Crore due to additional pension contribution as assessed by actuarial valuation done by the actuary.

Chapter 2 : Operational and Financial Performance of Board

2.1 Operational Performance

The performance and the operational status of the Board on the basis of information made available to the Commission, has been analyzed in this chapter. The purpose is to assess the existing operational efficiency of the Board and suggest the specific areas in which improvement is required so that the Board serves consumers in an economically efficient manner. The Board has not submitted historical data about its performance since its inception (November, 2000). Nor has the actual figures for FY 05 furnished to the Commission. The analysis has been done on the basis of actuals for FY03 (wherever available), FY 04 and estimates for FY 05.

2.2 Generation

The Board has a total installed capacity of 1410.85 MW of which 1280 MW is thermal and 130.85 MW is hydel generating capacity. The performance of the generating stations has been analyzed in the following paras.

2.2.1 Installed Capacity

The Board has two coal based thermal plants and two hydro stations. The details of these plants are as under:

	Name	No. and Capacity of Units (MW)	Date of Commissioning
1	Korba (East) TPS phase II Total Capacity : 200MW	Unit I : 50 MW	September, 1966
		Unit II : 50 MW	May, 1967
		Unit III : 50 MW	March, 1968
		Unit IV : 50 MW	October, 1968
2	Korba (East) TPS Phase III Total Capacity : 240MW	Unit V : 120 MW	April, 1976
		Unit VI : 120 MW	April, 1981
3	Korba West TPS Total Capacity : 840MW	Unit I : 210 MW	June, 1983
		Unit II : 210 MW	March, 1984
		Unit III : 210 MW	March, 1985
		Unit IV : 210 MW	March 1986
4	Hasdeo Bango HEP Total Capacity : 120MW	Unit I : 40 MW	March, 1994
		Unit II : 40 MW	November, 1994
		Unit III : 40 MW	January, 1995

	Name	No. and Capacity of Units (MW)	Date of Commissioning
5	Mini Hydel Power Station, Korba Total Capacity : 0.85MW	1x0.85 MW	Jan'03
6	Gangrel HEP Total Capacity : 10MW	Unit I : 2.5 MW Unit II : 2.5 MW Unit III : 2.5 MW Unit IV : 2.5 MW	April' 04 June' 04 Oct' 04 Nov'04
TOTAL CAPACITY : 1410.85 MW			

2.2.2 Energy Generated

The details of the gross energy generated in FY03 and FY04 and generation in FY05 are given below:

Sr.No.	Details	FY03 (MU)	FY04 (MU)	FY05 (MU)
1	Korba East Phase II	864.478	995	1402
2	Korba East Phase III	1158.40	1009	841
3	Korba West	5570.37	5613	5298
4	Generation from Hydel stations	276.972	295.56	410
	TOTAL	7870.22	7912.56	7951

Due to their complete refurbishment, Unit I and IV were not available for generation for 142 and 172 days respectively in FY 04. As a result, the generation in Korba (E) Phase II was less in FY 04.

Both the units (2x120 MW) of Korba (E) Phase III have also undergone refurbishment. Unit VI has been re-commissioned in October 2003 and Unit V in March 2005, after complete refurbishment. Hence generation from the plant has been low in FY04 and FY05.

2.2.3 Plant Utilization Factor

The plant utilization factor of the various plants of the Board is given in the following table:

	Details	FY03	FY04	FY05
1	Korba East Phase II	61.68%	62.95%	80.0%
2	Korba East Phase III	55.10%	47.87%	40.0%
3	Korba West	75.70%	76.07%	72.0%

As explained earlier, the PUF in the previous years was low as the units of Korba (East) were under refurbishment.

However, the comparative PUF data of the thermal power plants of various states and of the Central sector given in the following table shows that the PUF achieved by the Board compares well with the all India and the state sector PUF levels.

Particulars	PUF in %	
	FY04	FY05
All India	70.2	72.8
<i>Central Sector</i>	75.6	78.8
State Sector	65.9	68.1
<i>Western Region</i>	72.3	76.7
<i>Madhya Pradesh</i>	65.1	68.9
Chhattisgarh	66.2	72.6
<i>Maharashtra</i>	73.8	76.0
<i>Gujarat</i>	87.2	86.6

2.3 Transmission

This function is expected to assume greater importance in future in view of the provisions in the Act for open access to distribution licensees, traders and consumers. In undivided Madhya Pradesh the Chhattisgarh area was very poor in transmission network. At the time of creation of Chhattisgarh the network was about 9% of MPEB. The Board has, ever since its creation, taken up major investment in expansion of the transmission network. Large investments have been made from internal accruals. The transmission network today is as under:

Voltage (kV)	Transmission lines (Ckt. km)	No. of Substations	Total Substation Capacity (MVA)	No. of Transformers
400	277.00	1	945	3
220	1,677.32	7	1,930	16
132	3,390.56	35	2,309	73
HVDC	360.00	1	243	6
Total	5,704.88	44	5,427.00	98

2.3.1 Transmission Losses

The transmission losses in FY04 and FY05 are reported to have been at a low level of 3.71% for both the years. The reason given is the proximity of the main load centers to the power generating stations. This, however, looks too low to be true.

2.3.2 Capacitor Installation

The installation of capacitor in the system is essential to improve the power factor and reduce reactive power. The total capacity of the capacitors installed today is 364 MVAR.

2.4 Distribution

Distribution is the most critical segment of the electricity business chain. The inefficiencies of the whole chain manifest in the distribution function as the common consumer's interface with the Board is through the distribution function only. The distribution system is also the main contributor to losses, inefficiency and unreliability in the power sector.

The details of category-wise number of consumers, their connected load and the sale of electricity in FY05 of the Board is given below:

Category	Number (<i>'000s</i>)	Connected Load	Sales (MU)
LT			
Domestic	1244	527	1114.08
SLP	686	33	123.56
Agricultural	104	310	202.84
Commercial	162	173	238.73
Industrial	20	313	326.88
others	43	100	175.06
Total LT	2259	1456 MW	2181.15
HT			
Railway	0.02	224	554.18
Cement	0.01	108	638.23
Coal	0.02	91	427.93
Mini Steel Plants	0.04	208	504.28
others	0.60	825	56.53
Total HT	0.687	1363 MVA	4955.36
Total HT+LT	2259.69		7136.51

The performance of the Board in respect to Distribution parameters has been analyzed in the following paras.

2.4.1 Distribution Losses:

A part of the distribution losses are technical in nature while the other significant part is due to commercial and operational inefficiencies. The distribution losses as a percentage of energy available, as reported by Board, are 36.94% in FY05 which does not seem to be correct.

However, the reported loss figure does not adequately reflect the actual level of losses in the distribution system of the Board. The sale of power at EHT level (BSP, Railways etc.) is higher in the state as compared to other consumers. It is expected to be 2083 MU in FY05, thus constituting around 29.32% of the total energy sold within the state. Keeping in view that the quantum of supply to these major consumers and also the fact that the losses in the EHV transmission system are very low, the distribution loss in the remaining system may be higher than the figures quoted by the Board.

2.4.2 Metering

The first step in controlling the energy losses is to accurately measure the consumption of different consumer groups in the system. In the absence of metering, the level of losses remains an approximation as it is very difficult to distinguish between the actual losses and the supply to un-metered consumers. The overall loss level reported by the Board thus would depend on the approximation of the load factor assumed for assessing the supply to un-metered consumers.

The Board has submitted that the number of un-metered consumers is 8.44 lakhs out of the total 22.60 lakh connections. Thus around 37% of the consumers are un-metered. Most of these un-metered consumers are in the SLP and agriculture consumer categories.

The number of un-metered consumers is very high and Commission has directed the Board that in future all new connections must be served with meters. Simultaneously, all un-metered connections have to be metered by March 2007.

2.4.3 Failure rate of transformers:

Transformer failures adversely affect the reliability of supply and it has to be controlled by the Board. The distribution transformer failure in the last two years is given in the table below:-

<i>Particulars</i>	<i>FY04</i>		<i>FY05</i>	
	Transformer installed	Percentage failure	Transformer installed	Percentage failure
EHV Transformer	87	2.29	96	2.08
33/11 KV Transformer	590	2.37	623	2.56
Distribution Transformer	35950	16.30	38936	18.36

The rate of failure of the distribution transformers is very high at 18.36%. The Board needs to make efforts to bring it below 10%.

2.5 Financial Performance of the Board

The CSEB has not submitted its Annual Financial Statements in the proper formats prescribed by the Electricity Supply (Annual Accounts) Rules, 1985 (ESAAR). The Commission has been informed that neither the above statements have been prepared by the CSEB for any of the five previous financial years since its inception (2000-01) nor audit of the accounts has been done so far. The financial statements in the formats prescribed by ESAAR and the schedules thereof should form the base data for regulatory and tariff determination purposes. In the absence of these, the Commission has looked at the financial performance of the Board on the basis of with whatever data have been made available. The Commission has directed the Board to finalize the accounts and get its accounts audited for all years since inception before March 2006.

2.5.1 Revenues

The Board has provided the data for FY04 on actual basis and for FY05 on estimated basis. The total revenue including miscellaneous revenue has been Rs. 2458.35 crore for FY04 and it is estimated at Rs. 2548.89 crore for FY 05. The total power sold was 6624 MU and 7137 MU in FY04 and FY05 respectively. This shows an increase of approximately 8% in FY05 over the previous year. The consumer-wise sale in FY04 and FY05 is given below:

Consumer Categories	Sales in FY03		Sales in FY04		Sales in FY05	
	MU	Rs. in crore	MU	Rs. in crore	MU	Rs. in crore
Domestic	854.47	155.59	974.89	181	1,114.08	215
Single Light Point	164.36	18.79	113.3	17	123.56	18
Non-Domestic	188.37	88.69	210.81	100	238.73	106
Public Water Works	40.54	7.1	43.86	8	47.37	7
LT Industry	270.31	109.12	297.75	120	326.88	142
Agriculture	726.08	24.37	177.7	28	202.84	30
Street Light	34.59	7	39.14	8	44.12	8
Board Employees			16.52	2	17.80	3
Temporary Connection	81.73	9.41	65.77	11	65.77	11
LT TOTAL	2360.45	420.07	1,939.74	475	2,181.15	539
Railway Traction	494.58	253.56	528.99	237	554.18	234
Coal Mines	382.89	158.75	404.64	166	427.93	175
Cement Factory	633.40	228	626.82	227	638.23	254
Mini Steel Plant	312.77	98.51	437.49	127	504.28	182
Electro Chemical / Electro thermal	717.15	259.75	30.01	4	30.91	12
General Purpose			285.83	135	319.52	150
Two Part Tariff			396	139	423.72	170
Slab Tariff			147.64	59	158.25	63
Ferro Alloys	141.23	38.81	380.96	98	407.63	143
HT Public Water Works	21.85	5.13	24.2	6	27.00	6
Tube wells of Irrigation Deptt	8.08	2.88	5.64	1	5.64	1
Others at 132 / 220 kV	1230.83	494.32	1,415.61	556	1,458.08	550
HT TOTAL	3942.78	1539.71	4,683.83	1755	4,955.37	1940
HT + LT TOTAL SALES	6303.23	1,959.78	6,623.57	2230	7,136.52	2479

The margin of average revenue over the cost of supply per unit is given in the following table: -

Sr.No.	Details	FY04	FY05
1	Average Revenue	Rs. 3.37	Rs. 3.47
2	Average Cost of Supply	Rs. 3.00	Rs. 3.53
3	Margin of Revenue over Cost	Rs. 0.37	(-)Rs. 0.06
4	Revenue as percentage of cost	112%	98%

As per the submission of the Board, the average tariff for various consumer categories as against the average cost of supply has been worked out. However, if we compare the percentage recovery of average cost of supply from different categories (given in the table below), it will be observed that extensive tariff rationalization is required to gradually bridge the gap between the cost of supply and the tariff, as mandated under the Act. The Board has to progressively reduce and eliminate cross subsidies except for the economically weaker sections of society.

Consumer category-wise average tariff and percentage cost of supply

	Category	FY04		FY05	
		Avg. Tariff	% of cost of supply	Avg. Tariff	% of cost of supply
		Avg. cost of supply : Rs. 3.00 per unit		Avg. cost of supply : Rs. 3.53 per unit	
1	Domestic	1.85	62	1.93	55
2	Single Light Point	1.54	51	1.45	41
3	Non-Domestic	4.75	158	4.44	126
4	Public Water Works	1.75	58	1.52	43
5	LT industry	4.03	134	4.33	123
6	Agriculture	1.57	52	1.47	42
7	Street Light	2.06	69	1.91	54
8	Board Employees	1.41	47	1.41	40
9	Temporary Connection	1.65	55	1.65	47
10	Total (LT)	2.45	82	2.47	70
11	Railway Traction	4.48	149	4.22	120
12	Coal Mines	4.1	137	4.09	116
13	Cement Factories	3.63	121	3.97	112

14	Mini Steel Plants	2.91	97	3.6	102
15	Electro-Chemical/Thermal	1.49	50	3.81	108
16	General Purpose	4.70	157	4.70	133
17	Two Part Tariff	3.51	117	4.01	114
18	Slab Tariff	3.96	132	3.76	112
19	Ferro Alloys	2.58	86	3.51	99
20	HT public Water Works	2.39	80	2.15	61
21	Tube Wells of Irrigation Dept.	1.18	39	2.23	63
22	Other 132/220kV consumer	3.93	131	3.77	107
23	Total (HT)	3.75	125	3.91	111
24	Total HT + LT	3.37	112	3.47	98

2.5.2 Collection efficiency

The Board suffers not only from high T&D losses but also from low collection efficiency. The collection efficiency of current dues is around 90%, which results in high amount of receivables. The collection efficiency has to be improved by the Board to improve their financial position, which is already showing a downward trend.

Details	FY04	FY05
T&D Losses	41.95%	38.96%
Collection Efficiency	92.00%	90%
AT & C losses	47.06%	43.74%

2.5.3 Interest liability

CSEB has shown total loans amounting to Rs.1,020 Cr., 2,734 Cr. and 4,191 Cr. in 2003-04, 2004-05 and 2005-06 respectively which includes new market borrowings of Rs.1,551 Cr. and Rs.2,591 Cr. for 2004-05 and 2005-06 respectively. On scrutiny, it is found that CSEB has not raised any new market borrowing in 2004-05 and it seems that there is no need to raise any loans in 2005-06 as well. Therefore, the actual loans raised in 2003-04, 2004-05 and the loans proposed to be raised in 2005-06 comes to Rs.1,020 Cr., 1,184 Cr. and 1,600 Cr. respectively.

The average rate of interest paid/estimated to be paid on borrowings comes to 12%, 16% and 14% in 2003-04, 2004-05 and 2005-06 respectively, whereas, the rate of interest earned on investments during the corresponding years comes to 3.96%, 6.1% and 6.1%. The interest paid is much more than the interest received which shows lack of financial prudence on the part of CSEB and needs to be corrected.

Chapter 3 : Tariff Philosophy

3.1 Provision of the Act

The Commission draws its powers to determine electricity tariff from the following provisions of the Act:

- **Section 45 (2)** The charges for electricity supplied by distribution licensee shall be (a) fixed in accordance with the methods and the principles as may be specified by the Commission.
- **Section 61** lays down the broad principles which should guide determination of tariffs: Generation, transmission, distribution and supply should be "conducted on **commercial principles**;" that the tariff should "**progressively reflect cost of supply** of electricity" and also "**reduce and eliminate cross-subsidies**" within the period to be specified by the Commission. The provisions of this section also lay emphasis on **safeguarding consumers' interest** and at the same time recovering cost in a reasonable manner. Section 61 also provides that determination of tariff should also be guided by the National Electricity Policy (NEP). Further, tariff determination should be guided by **factors** which "**encourage competition, efficiency, economical use of the resources, good performance and optimum investments.**" In determination of tariff, the Commission is thus required to balance consumers' interest while optimizing investment in this sector and ensuring commercial principles.
- **Section 62(3)** This section lays down the conditions under which differentiation in tariff is permissible.

3.2 National Electricity Policy (NEP):

The National Electricity Policy declared recently, aims at accelerated development of the power sector, and has as its objectives -

- *ensuring availability of reliable power* of specified standards in an efficient manner and at reasonable rates; and
- *achieving the financial turnaround and commercial viability* of the electricity sector.

3.3 Present Electricity Tariff Regime in the State:

The present tariff structure of the CSEB is as was prevailing in the erstwhile MPEB for years and reflects then prevailing socio-economic considerations in undivided Madhya Pradesh. The present tariffs came into force in March, 1999 as revised by the erstwhile MPEB. The design of the existing tariff therefore, does not conform to the current thinking on power reforms.

Before the start of reforms in the power sector, electricity was treated more as a public service rather than a techno-commercial business

based on cost of service, leading to distortions in consumption and gradually eroding the SEB's financial viability and to poor performance and inefficiency of the utility and poor quality of service to consumers. This process has to be reversed and tariff is the main instrument for bringing about this reversal. The conceptual issues of tariff regulation are by now well settled in the country's electricity regulatory domain.

3.4 General Method of Price Regulation:

The Commission has to choose the framework to regulate the tariff and charges of the utility in conformity with the provisions of the Act. The mandates of the Act have been mentioned above. There are two broad approaches to regulating electric power prices of a utility/licensee: Rate of Return Regulation (ROR) and Performance Based Regulation (PBR).

ROR Regulation is the traditional framework for setting electricity prices, which is also referred to as cost plus regulation, because the regulated entity is able to collect from its consumers all its prudently incurred expenses plus a regulated return on its prudent investment. In general this method sets the total allowed revenue of the utility.

The advantage of ROR regulation is that the prices are fixed based on a test year and they are unchangeable until the next tariff revision. Once the prices are set, the regulated entity's ROR varies, depending upon costs and sales and upon the utility's ability to control the controllable costs. This method is convenient to meet the subsidy for some categories. The cost plus regulation, however, does not give incentive to the utility to minimize cost in the long run. Secondly, if the rate of return allowed is less than the actual cost of capital, then that would be a disincentive for the utility to make further investment.

Performance based Regulation (PBR) is a modification of ROR regulation. At pre-set intervals (say 3-5 years), the base line rates are reset using the ROR principles and between these baseline tariff settings, tariffs are allowed to be adjusted based on specific formulae that include as variable measures, the utility's performance, cost indices, etc. It provides a system of incentives/penalties for utility's performance above or below the normative parameters i.e. earning incentive for better performance and disincentive for poor performance. A definite incentive for cost minimization and improving service quality can be built into the system. But the PBR system requires substantial data to set the base line tariffs and formulae for adjustment. There is less regulatory scrutiny in a well-designed PBR system because incentives take the place of regulatory oversight. Unless the performance system is carefully designed, there may be an incentive for the utility to lower service quality, while pursuing monetary incentives in other areas.

The Commission is of the view that combination of ROR regulation and PBR shall be suitable, which shall enable to minimize the disadvantages to certain extent by introducing the system of reward and penalties in relation to performance of the utility.

3.5 Cost of Supply (CoS)

Broadly there are two approaches to determine the cost of supply i.e., the embedded cost-based allocation and the marginal cost-based allocation.

The embedded cost approach seeks to identify and assign the historical or accounting costs, which make up the utility's revenue requirement. Marginal cost approach seeks to determine the incremental (marginal) change in the total costs imposed on the system by a change in the output (whether measured by kWh, consumer or consumer group or other relevant cost-driver).

With a forward looking approach, the marginal cost studies are data intensive and are, therefore, contingent upon the accuracy of data. The embedded cost model can be easily implemented and understood and data is readily available and verifiable. The Commission, therefore, proposes to follow the embedded cost model.

The CoS model allocates the Aggregate Revenue Requirement (ARR) of the utility to various categories of consumers through the process of functional categorization as per intrinsic nature of underlying costs, i.e. Demand (fixed cost), Energy (variable cost) and Customers (fixed cost). Demand (fixed) costs are interest, depreciation, return and repair/maintenance and employees' cost. The energy (fuel) cost varies with kWh consumption. The customer's cost (fixed nature) are associated with the functions of metering, customer related activities, including operating expenses associated with meter reading, billing and accounting. The cost is then allocated to different categories of customers such as agriculture, domestic, non-domestic (commercial), and industrial, etc.

Costs are allocated to consumer classes consistent with the cost impact, which the class loads impose on the system. Apportioning of losses is a crucial step in this module. First these should be segregated voltage-wise (HT and LT) and thereafter apportioned to categories.

However, in the present scenario even reasonably correct allocation of costs to various categories of consumers is not possible due to the inadequacy of the data available with CSEB. The Board should urgently take up energy accounting and energy auditing to find out cost of supply to different category of consumers.

In cost allocation it would be difficult, in the context of Chhattisgarh, to completely ignore the socio-economic factors. The NEP while underlining "the urgent need for recovery of cost of service of consumers to make the power sector sustainable" has also noted "a minimum level of support may be required to make electricity affordable for consumers of very poor category". In Chhattisgarh, as in most States, it is mainly the domestic and agriculture consumer categories whose tariffs are lower than the cost of supply.

Considering that gradual reduction in cross-subsidy is mandated under the Act and keeping in view the socio-economic objective as above, the Commission feels that while subsidy for agriculture may continue, it should be well targetted so that the benefit flows only to those who deserve it. The Commission feels that agriculture tariff may be increased in a manner so that in the next five years, commencing FY 05-06, the tariff progressively reflects at least 75% of the cost of supply. For better targeting of the subsidy, the tariff for agriculture pumps should increase with increasing connected load. The consumers using higher HP pumps use more power and are the main beneficiary of the cross subsidy while they have better capacity to pay.

As has already been brought out earlier, industrial customers including Coal Mines and Railways are the main source of revenue for the utility and they contribute more than two-third of the total revenue of the Board. It would be necessary that steps are taken to avoid their migration to captive power/alternative sources of power. Their continuation with utility is essential with the view to ensure its continued financial viability and also to ensure availability of adequate cross-subsidy in the system. Some of the concerns in this context, however, need to be addressed. Industrial tariff should not be increased beyond a certain level, which is unsustainable and unacceptable in comparison to the cost of captive power. Secondly, in an era of liberalization of power industry, which is moving towards competition and the free play of market forces in the sector, pricing of electricity is important. Prices not in line with the cost of supply can render the utility uncompetitive. On the other hand, low and subsidized tariffs have impact on optimal demand for power, which puts undue pressure on the system capacity and the quality of service. Thus, the need is to have a balance in tariff setting between subsidizing and subsidized categories. As such, apart from tariff, there should be a built-in incentive for the major customers; an incentive on higher consumption over and above a certain load factor limit should be considered.

3.6 Multi-Year Tariff Principles

The time is not ripe for fixation of multi-year tariffs (MYT) in the State, due to uncertainties of different input costs like power purchase, employees cost, financial cost, etc., some of which are uncontrollable. MYT moreover requires comprehensive historical data. Adequate data is not available with the Board at present. However, in order to ensure predictability and consistency of the tariff-setting process, multi-year tariff principles need to be formulated. The Commission will separately endeavour to give a clear indication to the utility as well as the customers, regarding its policies and plans for the future.

3.7 Tariff principles for generation, transmission and distribution as per CERC guidelines /Draft National Tariff Policy:

Section 61(a) of the E.A., 2003 provides that the Commission shall be guided by "the principles and methodologies specified by the Central

Commission for determination of the tariff applicable to generating companies and transmission licensees." The Commission, therefore, proposes that for generation, the CERC (Terms and Conditions of Tariff) Regulation, 2004, shall be generally taken as the guide.

Accordingly, the Commission proposes the following main principles:

(a) Target availability for recovery of full capacity (fixed) charges:

Recovery of fixed charges shall be based on 'normative availability' to be fixed by the Commission as per past performance, working condition of the utility, age and condition of plants, funds availability to take up annual O&M and renovation and modernization programme for different power stations/generating units. The benchmark parameters from outside the State/other utilities shall also be taken into consideration.

(b) Target Plant Load Factor for incentive:

Normative PLF shall be fixed by the Commission for different power stations on the same principles as adopted for 'availability' mentioned above.

(c) On the same grounds other normative parameters shall be fixed for the control period.

(d) Rate of Return (ROR):

Section 61 (i) of the Act provides that in determination of tariff the Commission shall be guided by the National Tariff Policy. The draft National Tariff Policy of Government of India provides that the rate of return notified by CERC for transmission should be adopted by SERCs for distribution.

In consideration of the provisions of the EA'03, CERC guidelines, draft tariff policy and in order to allow the Board adequate surplus for investment in generation, transmission and distribution sectors, the Commission considers it appropriate to allow 14% return on the net-worth of the Board at the beginning of the year. Net-worth has been considered for the purpose of the ROR because the retained earnings are supposed to have gone into creation of new fixed assets. The Commission also feels that this will give a right signal for private investment in the power sector of the State.

3.8 External Subsidy from the State Government:

Presently the tariff for agricultural, water works, street light and domestic consumers are much below the cost of supply. This is causing a heavy burden of cross-subsidy on the subsidizing categories. The Commission feels that concessional tariff below the cost of supply, with reasonable cross-subsidization should only be allowed for marginal farmers upto a certain land holding which may be decided by the Government and for domestic consumers of below the poverty line (BPL) using not more than

30 units per month. All other consumers except the above categories should normally pay tariff so as to cover the cost of supply. The Commission would like to bring about such a position in tariffs progressively.

In the matter of provision of subsidy by the State Government to above or any other class of consumers, the principle adopted shall be as per the provisions of Section 65 of the Act. The State Government shall pay such subsidy in advance and in such a manner as may be specified by the Commission. For this purpose, the tariffs determined by the Commission under Section 62 shall be presented to the State Government for deciding the subsidy to be granted to any consumer or class of consumers.

3.9 Fixed and variable cost of supply:

Section 45(3) of the Act provides that charges for electricity may include a fixed charge in addition to the charge for the actual energy supplied. The objective is to recover through the tariff the corresponding fixed and variable components of the cost.

In the absence of data of consumer category-wise cost of supply and its breakup into fixed and variable components, the Commission for the time being, has adopted the concept of fixed cost along with the energy charges in determination of tariff on broad principles and in future shall bring up the fixed part of the tariff to the level of actual fixed cost component of the cost of supply. The Board should carry out studies in order to identify the cost of supply for all categories of LT and HT consumers and classify the cost into fixed and variable components.

3.10 Variable cost adjustment:

The cost of fuel and the cost of purchase of power are the two important components of costs, which are subject to fluctuation, sometimes very wide fluctuation. The utility has to be insulated against such fluctuation through a provision for adjustment in tariff even during the year. Particularly in the context of Chhattisgarh, where thermal generation accounts for 91% of total generation and 40-42% of the power consumed is purchased from various sources and there is a likelihood of the quantum of power purchase going up in the middle of the term, a variable cost adjustment formula should be built into the tariff design. The utility should include present component of fuel in the tariff and there can be a built-in provision for upward and downward revision in the fuel cost component of tariff if the revision in fuel cost is beyond a tolerance limit worked out in advance. A similar principle can be adopted for the cost of power purchase. The purpose of such cost adjustment is to insulate the utility from the risk of wide variation in a major component of cost over which the utility has no control.

3.11 Needs for rationalization of Electricity Duty (E.D.):

Prior to 1995, the Electricity duty was in absolute rupee terms for all categories. In 1995, the erstwhile Government of M.P. prescribed recovery of E.D. at specified percentages of energy charges. At that time the domestic tariffs were quite low. On this tariff the incidence of E.D. was also low. Thereafter, particularly in late 1990s due to rationalization of tariff, the hike in the domestic tariffs had been quite high. With the rise in the rates of domestic tariffs and the percentage of E.D. fixed prior to such rationalization, the effect of E.D. on domestic categories has become quite high. The State Government may consider reducing the E.D. for domestic categories (in terms of percentage) so that burden of high E.D. on consumers is reduced. Similarly, incidence of E.D. on all categories may need examination after the first tariff revision.

Chapter 4 : Objections and suggestion from the public/ consumers, CSEB's response and Commission's ruling

Transparency in the operation of power utilities is one of the important tenets of the reforms in the power sector envisaged in the EA'03. The process of determination of electricity tariff, particularly of a power utility which is the sole provider of power in the State, should provide adequate opportunity to all stakeholders to examine the proposals and have their say and it should be a consultative process. Section 64(3) of the Act mandates that the Commission consider all suggestions and objections received from the public before issuing the tariff order on the petition filed by the licensee. Such consultation has in many cases in other States, led to greater efficiency and lowering of costs. The Commission, therefore, decided, to conduct public hearing on the tariff petition filed by the CSEB at various places in the State. Public hearing was held, after adequate notice, as mentioned in chapter-1 of this order, at the following places on the following dates mentioned against each:

1.	Bilaspur	5.4.2005
2.	Ambikapur	6.4.2005
3.	Korba	7.4.2005
4.	Jagdalpur	11.4.2005
5.	Raipur	13.4.2005
6.	Bhilai	15.4.2005

The Commission would like to mention that public hearing was held in Ambikapur and Jagdalpur, which are not otherwise major electricity consuming centres, with a view to provide an opportunity to the people of the interior tribal areas of the State to voice their objections and comments on the operation of the CSEB in general and on the tariff petition in particular.

In the public hearing, a large number of individuals/groups, organizations and consumer associations participated and appraised the Commission of their views on the tariff proposals filed by CSEB. The total number of written representations received were 69. A list of the persons/groups/ consumer associations who have submitted their objections is appended at the end of this chapter. All the objections/suggestions/comments by public on ARR filing were forwarded to CSEB for their response. Category-wise issues along with CSEB's response are given below. Wherever possible, the Commission has tried to address the issues in determination of the tariff. However, certain issues may remain unaddressed because of the inherent limitations of the process of tariff determination.

Issue No 1: Cost of Supply

The CSEB has not provided consumer category-wise cost of supply. The cost of supply should be assessed considering all the aspects including technical

losses in giving supply to different categories of consumers. The cost of supply shall be dependent on the voltage level and cannot be same for all categories of consumers. It should also include the cost of services to be provided by licensee to a particular category of consumer, assessed on per unit basis.

The Board's reply:

Every category of consumer will have different T&D loss. However, it may not be possible to fix tariff based on actual T&D loss. The HT consumers will have lower T&D losses, but if the tariff is fixed on this basis then the consumers in remote areas have to pay many times the present tariff, which is not practicable. Therefore, the cost of supply has been assessed on average T&D losses.

Commission's view:

The objection is valid to an extent. However, the Board was not able to provide adequate data regarding the category-wise cost of supply. The Commission has been informed that the Board is implementing SAP (Enterprise Resource Planning) software for better operational efficiency. The Board may therefore be able to provide category-wise cost of supply in the next tariff petition. The Board may engage a consultant for carrying out the exercise of cost of supply, if necessary.

Issue No 2: Increase in coal price on estimated basis in ARR

In ARR, the increase in coal price has been estimated as 10% during FY06 over the price prevailing as on 31/03/2005. At the same time CSEB has also proposed future adjustment in tariff due to increase in fuel price from time to time through the proposed variable cost adjustment formula, effective from 1.4.2005. In view of this, the increase shown in coal rate in ARR for the Financial Year 2005-06 is not justified.

Board's reply:

Presuming that there may be a hike in coal prices before the tariff order is finalized and issued, the price escalation has been taken into account.

Commission's view:

The objection is valid. The Commission has allowed the cost of coal at current rate with increase in fuel price during the year to be passed on to the consumers through a Variable Cost Adjustment formula as described in chapter 7.

Issue No 3: Depreciation on Fixed Assets

The CSEB is collecting amount from consumers under contribution, grants and subsidies towards cost of capital assets, which is not refundable. In the current year (FY-05) it is estimated to be Rs.117.5 crores. The same amount is not

deducted from the Gross Fixed Assets (GFA) and depreciation is charged on GFA, due to which the consumer has to pay extra on this account in ARR.

Board's reply:

There is no such provision in ESAAR, 1985.

Commission's view:

It has tried to address the issue of higher depreciation by reducing the allowed depreciation from Rs.135crores to Rs.111crores. The Commission has allowed depreciation at the rate of 4% on new addition to the fixed assets during FY-05 and FY-06, over and above the actual depreciation charged for FY-04.

Issue No.4 Recovery of variable charge in terms of KVAh from H.T consumers

CSEB has proposed to recover the variable (energy) charges from H.T consumers on the basis of KVAh units. The KVA is an apparent power, which is calculated by the vector sum of active (KWh) and reactive (KVARh) power. There are no calibrated meters, which can measure KVAh consumption. Therefore, the proposal is impractical, non-technical and non-commercial.

Board's reply:

The objection of the Manufacturing Industries' Association regarding KVAh billing is totally wrong. Power is generated in terms of Volt Amp in KVA, which is not a reactive power but combination of KW and KVAR. Actually the reactive power is generated from the load and is also measured in terms of power factor. The reactive component is sheer loss though it also involves cost. The power purchased from the Central sector is also based on the same principles. The unit cost in proposed tariff structure has already been reduced appropriately for KVAh as compared to KWh. This practice of billing on KVAh basis is in vogue in Delhi, U.P. and H.P.

Commission's view:

The Commission agrees with the Board. KVAh billing would improve the power factor, which will also benefit the consumer. This is also a well-accepted practice in many States. However, in view of the objections, the Commission has decided to introduce KVAh billing system in FY-06 for Railways only and after watching the results, the Commission may consider introducing this method for other HT categories in future.

Issue No.5: Transmission & Distribution Losses

Most of the respondents took strong objections to the inability of the Board to reduce the present level of high T&D losses. Some of the common observations and suggestions with respect to T&D losses were as follows:

- T&D losses should be reduced to the ideal level over a period of next 2-3 years.

- The Board could not control T&D losses and these are exorbitantly high.
- It is not prudent to pass on the burden of the Board's inefficiency to the consumers.

Board's reply:

In the present socio-economic scenario, it is very difficult to achieve the ideal level of T&D losses in next 2-3 years. The Board has been trying hard to reduce the T&D losses for the last 5 years. Heavy investments have been made to strengthen the transmission and distribution network by adding EHT/HT/LT lines and power and distribution transformers. A lot of renovation work in the old network is still needed for which there are limitations of funds and resources. Even the assessment of technical and commercial losses require deep study. Board has suggested to reduce the losses by 1.9% during FY-05-06, which shall mean reduction of distribution losses to the extent of 4%.

Commission's view:

There is no doubt that the T&D losses in the Board are unacceptably high. The Board is directed to first carry out a detailed study on T&D losses. High loss areas be identified and effective actions taken to reduce the losses. Although, the Commission does not agree with the Board's proposal of extent of reduction of losses in the year 2005-06, but after submission of detailed study by the Board, the Commission shall give year-wise targets for reduction of losses in the next tariff order.

Issue No.6: Power theft

A large number of people/organizations raised the issue of power theft. There were suggestions as well as objections on this issue. Those are summed up as follows:

- Impose severe penalties on the consumers who are stealing power, which will act as a deterrent.
- There should be forums with Board's and consumers' partnership to keep vigil on power theft.
- There should be a system of reward for information about power theft. It was mentioned that a similar mechanism is in existence in the state of Gujarat, where recovery rate has improved impressively after proper implementation of this scheme.
- There are commercial showrooms, which are not charged according to their load.

Board's reply:

The Board is trying to reduce power theft with the limited resources presently available with it. Vigilance Squads have been formed which are deputed to various places in the State. Help of law and order authorities is taken to curb this menace. The State Government has been requested to form special courts as provided in the Electricity Act, 2003 so as to prosecute persons

involved in theft in an effective manner. Co-operation of the local people is also sought and informers are suitably rewarded for giving useful information. Still there is a lot of scope for improvement and the Board is installing meters at entrance points so that the theft can be detected easily.

Commission's view:

A multi-pronged strategy should be adopted to check the menace of theft of energy. Block-level Committees including officers from district administration, local police, local representatives of public and Board's officials be constituted and targets be given to these Committees.

Board has informed that an incentive scheme is already in operation for informers of theft cases. Such schemes should be widely publicized through newspapers and electronic media.

Systematic and effective checking plans for inspection of industrial and commercial premises be made and implemented.

The State Government may be moved to set up special courts as early as possible.

Targets for installation of meters on all 33 KV and 11 KV feeders have separately been given by the Commission to the Board, which will help the Board to identify theft prone areas.

Issue No.7: Metering

LT as well as HT consumers raised objections on the poor metering level in the State as compared to other States. The issues raised were as follows:

- Due to poor metering, additional bills are raised on the metered consumers and this encourages the power theft.
- Metering should be out-sourced, as the Board was unable to provide meters to the consumers in last 3-4 years.
- Readings should be taken regularly each month in cities where population is more than 100,000, so that the irregularities related to bills may reduce.
- Integration period of M.D. meters should be 30 minutes, instead of 15 minutes.

Board's reply:

There are about 8 lakh un-metered agriculture and single light point connections in the State. Although, the number is large, but quantum of electricity consumed is not much. The programme of meterization finalized by the Commission shall be implemented promptly. If required, the activity of providing meters shall be outsourced. This is however to be pointed out that on this account, additional bills are not sent to metered consumers.

Due to shortage of line staff recording of meter readings every month in towns above 1,00,000 population is not feasible at present.

Except for highly fluctuating loads like Railway Traction, mini steel plants, ferro-alloy plants, etc., the integration period of MD meter is 30 minutes.

Commission's view:

Through a separate suo-motu petition, the Commission had asked the Board to prepare a programme of metering of un-metered connections from the Board. The Commission has set March, 2007 as the target date for providing meters to all the connections. No new connection shall be served without meters. The Commission is deliberating separately on the Supply Code where the meter reading programme for different categories of consumers is going to be decided.

Issue No.8: Quality of service and supply:

A majority of the consumers from rural areas complained about the poor quality of supply viz. low voltage, poor repair and maintenance of lines, etc. The other issues raised were as follows:

- The response of the Board's officials on the complaints such as accidents, voltage fluctuation, transformer failure etc. is not prompt and usually takes 15 to 20 days.
- Villages are left in dark for weeks particularly in case of H.T. line failure. This badly effects the irrigation programme of farmers and in turn causes heavy financial loss to the farmers.
- There should be a standard time or maximum time to be taken by the Board to provide connections after depositing the money and completing the formalities by prospective consumers, subject to availability of funds for extension of line, if required.
- If power is supplied for 6-8 hours a day (as is the position in tribal areas), then the monthly bill also should be one third of the normal rate in tribal areas.
- Sarguja and Korba should also have call centres, which are proposed to be set up in Bilaspur and Raipur.

Board's reply:

In case specific complaints are brought to the notice of the Board, the corrective steps are taken promptly.

The issues like fixing a time frame for providing connections after completion of formalities, etc. are being considered in the Supply Code being framed by the Commission.

Supply in tribal areas is regulated only in case of shortfall in availability. The regulated load shedding as per the scheduled programme is done throughout the State without distinction. Therefore, there is no justification of making one-third rates of the normal rates in tribal areas.

After successful operation of call centers in Raipur and Bilaspur, the Board may consider opening of call centers at Sarguja, Korba and other places.

Commission's view:

The Commission has directed the Board to set up forums for resolution of consumers' grievances at Raipur, Bilaspur and Jagadalpur. In case, the Board's officials fail to attend the complaints of consumers in the prescribed time limit, the consumers may seek redressal of their grievances through such forums and the Ombudsman in the Commission's office.

The time limit for attending to fuse off call complaints, breakdowns, rectification of bills, providing new connections, etc. is being fixed in the Supply Code. The cases of abnormal regular load shedding can also be dealt with by the Forums.

Issue No.9: Interest and finance charges

Strong objections were raised to payment of Rs.50 crore, Rs.100crores and proposed payment of Rs.200 crore to the State Government in FY04, FY05 and FY06 respectively. Such payments were termed unjustifiable and plea was made that tariff should not take into account such payments as financial charges and burden poor people with tariff hike. Objectors also asked for disallowing these charges from the annual revenue requirement of the Board in FY06.

Board's reply:

The provision of Rs.192.11crore has been made on the basis of payment required to be made to the State Government. This cannot be compared with any standard.

Commission's view:

The Commission has considered the objection and has come to the conclusion that these payments are not justified. Hence these charges will not be allowed in the ARR.

Issue No.10: HT/LT industrial tariff

Objections regarding HT tariff were raised by individual consumers and also by some consumers' associations. The objections and suggestions are mentioned below:

- The tariff petition mentions that consumers below 25 HP will be charged Rs.2.50/unit, whereas consumers of 25 HP and above shall pay Rs.3.40/unit. The huge gap between these two categories should be

reduced and there should be one more slab between these two slabs for the consumers in 25-50HP category.

- The Board should clarify the statement "retail tariff is hiked for reducing the burden on the industry", for the benefit of the public.
- In order to reduce the consumption in peak hours, the Board should provide power at 30-35% lower tariff in off-peak hours so that industry is able to absorb the additional cost of night shift of employees.
- LT saw mill consumers should get power at subsidized rates or they should be billed on actual consumption basis instead of minimum charges of 45 units per HP per month, due to non-availability of timber and ban on use of saw mills during night hours.
- HT tariff should be reduced so that cottage industry is able to grow.
- Small Scale Industries should be provided electricity at subsidized rates especially in tribal areas like Sarguja, as they are not able to compete with industries situated in developed areas.

Board's reply:

- a) Tariff of LT industries upto 25 HP is kept low for promoting small scale and cottage industries. The demand of subsidized rates to SSI in tribal areas (like Sarguja) can be considered by the State Government and CSEB suitably be compensated.

The medium scale LT industries above 25 HP to 100 HP are proposed with a normal tariff in which concession for high consumption is inbuilt.

- b) Board has proposed rationalization of tariff in which cross subsidy is proposed to be reduced gradually to reach the cost of supply as per the provisions of Act.
- c) During night hours also, the Board has to purchase costlier power under ABT scheme and thus can not offer any rebate to the consumers for the use of power at night. However, 15% rebate has already been proposed under ToD for the use of power during late night.
- d) Board has already proposed a subsidized tariff for saw mills under 25 HP load and no minimum units are proposed to be billed, as is available in present tariff.
- e) The proposed tariff for the HT industries has been rationalized with an inbuilt incentive for the higher load factor and power factor.

Commission's view:

These are tariff issues. The just demands of all the consumers have been considered by the Commission in determining tariff.

Issue No.11: Comments related to employees' issues

Employees' union representative demanded that there is a shortage of manpower in the Board to run the operations smoothly. In view of the above,

the backlog of 7000 vacancies should be filled immediately, which will result in better recovery of dues and a check on power theft. They also mentioned that the employee cost of the Board is just 13% of the annual revenue, whereas 17% is a permissible limit. If recruitment programme is implemented in a short span of time, it will result in reduction of T&D losses by 5% or saving of Rs.300 crore and better maintenance of 300 sub-stations, which are maintained by contractors.

Board's reply:

Increase in the employee cost is not affordable because of its effect on the finances of the Board. It has to consider all the consequences before opting for increase in establishment cost.

Commission's view:

It is for the Board to consider the best option without adversely affecting the Board's finances and services to the consumers. The option of appointing franchisees and outsourcing few of the activities should be explored in view of changing scenario in power sector.

Issue No.12: Domestic tariff

A few persons raised the issue of domestic tariff and made the following points: Since the Board loses good amount of revenue in technical and commercial losses, its reduction shall obviate the need for raising the retail tariff.

In tribal areas like Sarguja, and Jagadalpur, the tariffs should be lower than other areas in the State as it should provide an opportunity for the tribal community to develop their area.

Board's reply:

As far domestic tariff is concerned, it is proposed to be rationalized as per the provisions of Electricity Act, 2003. Though reduction of commercial and technical losses has already been planned to be achieved gradually but it is not the only component which influences tariff. There are many other factors which influence the cost of supply and consequently the tariff. Demand for concession to tribal areas may be considered by the State Government only.

Commission's view:

The Commission agrees with the views of the Board but also agrees that T&D losses should be reduced.

Issue No.13: Unbundling of CSEB

The objectors felt that there is no need for unbundling of the Board into three separate companies as it is likely to increase the cost and hence tariff. As the Central Government is likely to review the scheme of unbundling of SEBs by 9th of June 2005, it would be in the interest of public at large to reject the tariff

petition filed by the Board or the tariff petition should be kept pending and reviewed afresh after a decision on the structure of the Board is taken.

Board's reply:

This is beyond the purview of the Board. The decision on restructuring is to be taken by the State Government.

Commission's view:

The Commission accepts the argument of the Board. It is felt that the tariff order should be passed as per schedule. Entity-wise tariff petition filing may be done for FY-07 when restructuring takes place. Further, Government of India has already extended the date for unbundling the SEB by another six months, that is, up to 9th December 2005.

Issue No14: Recovery of dues:

Some objectors expressed concern over the failure of the Board to recover past dues from various consumer categories. The main objections were as follows:

- Consumers felt that recovery of arrears from the local bodies (Municipal Corporation/Council etc.) to the tune of Rs. 64 crores and similar amount from the various Government departments, will make up for revenue gap of Rs. 114 crores shown in ARR for FY06.
- There is urgency to recovery of dues from large consumers like BSP, Rlys. etc. instead of burdening poor domestic consumers with tariff hike.
- There is anecdotal evidence that the honest consumers face disconnection by the Board, if there are arrears even for a month, whereas consumers with heavy arrears never come to grief even after repeated default in payment.

Board's reply:

- a) There are many constraints which adversely affect the recovery of dues. Even then the Board is trying its best to recover the outstanding dues against local bodies and Government departments. Disconnection of such public utility connections involves law and order issue and causes inconvenience to the general public and therefore difficulty in recovery of dues. However, the matter has been taken up with the State Government for adjustment of dues out of grant amount.
- b) The dues outstanding against BSP, Railways etc. relate to disputed amounts since the time of MPEB and most of these are sub-judice. Thus no action can be taken by the Board. Even then suitable actions are already under process to recover the dues from such high value consumers.
- c) It is not true that consumers with heavy arrears are not disconnected. Rather, consumers with heavy arrears are disconnected first. However, in case of connections which have disputed arrears it is not feasible to disconnect the supply until the disputes get resolved. Board is trying to

disconnect each and every consumer within the scope of available limited resources.

Commission's view:

The Board is advised to settle the old cases in a time bound manner. Senior field officers should keep a close watch on the recoveries especially of arrears. The Commission is setting up targets for collection for current demand and old arrears separately.

Issue No.15: Interest on consumers' deposit

A few objectors asked the Commission to make a provision of paying interest on the deposits made by the consumers with the Board.

Board's reply:

The matter is already under consideration of the Commission.

Commission's view:

The Commission has already directed the Board to pay interest on security deposit at bank rate w.e.f. April 1st 2005, payable in September 2005.

Issue No.16: Agriculture tariff

The representatives of the agriculture consumers felt that agriculture tariff proposed by the Board should be reduced as farmers in the State are very poor and their capacity to pay electricity bills is low. The general objections related to agriculture tariff are as follows:

- Tariff for agriculture consumers should be reduced from the current levels
- Option of flat or metered supply should be given.
- If the Board is not able to supply power for more than 6 hours a day, then the agriculture pump consumers should not be charged at all.
- Wrong calculations were made for agriculture consumptions as 272 MUs in FY-06, based on 17% growth over 203 MUs in FY-05, whereas it should have been 238 MU.

Board's reply:

The agriculture tariff proposed is the lowest amongst all consumer categories and highly cross-subsidized, while according to EA, 2003 the cross-subsidy has to be reduced gradually. Further, reduction of agriculture tariff will result in further increase in tariff for other categories. As per the provision of Act, all the connections are to be metered, even if flat rate tariff has been proposed for agriculture category. The average power supply available to agriculture consumers in Chhattisgarh is not less than about 20 hours/day. The tariff

proposed is comparable with the tariff of nearby States, where average power supply hours are not more than 12 to 16 hours a day.

The State Government has directed the Board to carry out the work of laying lines for 1 lakh agriculture pumps in three years. The Board has proposed to lay lines for 25000 pumps during the current financial year. The discrepancy in agriculture consumption was discussed during technical validation. The consumption has been re-assessed as 243.41 MU.

Commission's view:

The Commission agrees with the Board. It would not be in line with the letter and spirit of the Act to reduce the current level of agriculture tariff.

It is also provided in the Act that all connections should be metered.

Issue No.17: Reasonable return

The reasonable return of 16% is too high and not justifiable as it is very less in other States.

Board's reply:

The proposed reasonable return is according to the various provisions in draft national tariff policy and Central Electricity Regulatory Commission's guidelines.

Commission's view:

Every business entity is supposed to earn a reasonable return on its investment to survive in the long-term. Being a vertically integrated public utility, the Board should get a reasonable return on equity. As the Board has very low equity base and it seems that amount from reserves and surplus was invested in further capital expenditure. A return of 14% has therefore been allowed on its net-worth as discussed in para 3.7.

Issue No.18: Audited accounts

The figures provided by CSEB are not audited and prima facie seems to be incorrect and highly exaggerated. Many consumers have asked for the copy of the audited accounts for the validity of the figures quoted by CSEB.

Board's reply:

The audited accounts of CSEB are not available because no audit could be conducted so far. The Board, however, has been pursuing with the AG, Chhattisgarh for conducting the audit.

Commission's view:

The Commission has found that the Board is not able to provide data on many points. It is necessary for any large commercial entity to maintain proper accounts to operate efficiently. Being a public utility in the most important

sector, it is necessary that the accounts are got audited immediately since inception with opening balances as per the Ministry of Power order dated November 4, 2004. The Board is being directed to get audited its accounts since inception before December 31, 2005.

Issue No.19: Power block charges:

CSEB has proposed the levy of power block charges, (for shutdowns of electricity feeders) similar to what South East Central Railways levies on CSEB. The charge would be equivalent to the average load on the particular feeder during the period for which it was blocked at the average tariff approved by the Commission. The Railways have pointed out that they are charging only Rs.96,400/- for power block per hour (part of an hour being treated as one hour for this purpose). Further the Railway is not charging Electricity Boards on the basis of the loss incurred by it. The Railway has further stated that if there is redundancy in CSEB's circuit, the power can be diverted through another circuit. The Railway does not have such an option.

Board's reply:

The ground on which the Railways have been protesting the levy of power block charges by CSEB does not seem to be logical. The Board's action is justified on the same grounds that the Railways claim levy of such charges. The Board has equal right to compensate its losses.

Commission's view:

The Commission is not considering to levy this charge at present as the Board has not furnished the necessary details.

Issue No.20: Tariff of mini steel Plant

The Commission has received objections to the tariff of mini steel plants proposed by CSEB. The main objections by various steel industry representatives are as follows :

- The tariff philosophy has advocated reduction in various HT categories. Accordingly, the Board has reduced the same to only two categories for one voltage level i.e. industrial and non-industrial, without considering the fact that certain industries need different tariff because of their working conditions.
- Most of the rolling mills are operating for one or two shifts causing low load factor of 10-20%. Apart from this they are required to have higher contract demand due to fluctuating load resulting in less load factor. For such industries, the tariff has to be energy based only, as per the existing tariff. The impact of demand charge on rolling mills as per proposed tariff, shall ultimately cause a huge rise in overall rate of their product.
- The mini steel plants and rolling mills in the same premises are also required to have higher contract demand due to fluctuating load

resulting in low load factor. For such industries also, the tariff should be energy based, as per existing tariffs.

- Separate tariff should be framed for the industries having CPP, so that the rate of power imported from Board is reasonable.
- A sample calculation for rolling mill and mini steel plant clearly indicates that the increase in tariff for a rolling mill is about 72% and that for mini steel plant it is about 53%.

Board's reply:

The impact of proposed tariff for re-rolling mills will be 24% with their normal average load factor as compared to present tariff. Increasing the load factor, which depends on the consumer only, may reduce the impact of the proposed tariff increase. The tariff formulation cannot be done with the assumption that the consumption would be at a minimum level. The Board has to incur substantial portion of cost of supply as fixed cost. Therefore, it is not possible to maintain the tariff with energy charges only. The existing tariffs for rolling mills and MSP consumers are even less than the cost of supply resulting in a loss to Board. The demand charges proposed are only 30% of the actual costs incurred by the Board towards fixed component of cost of supply. The calculation shown at 10% load factor does not indicate actual scenario. The actual average load factor during the year 2003-04 was around 22% in case of rolling mills.

Commission's view:

The Commission has studied the objections as also the reply from the Board. It has addressed the issue of additional burden on the MSP consumers in designing the tariff for HT consumers. Efforts have been made in the tariff design to reduce the impact of hike on MSP consumers having a low load factor.

Issue No.21: Unauthorized colonies

The Municipal Councils have a rule that un-authorized colonies should not be provided electrical connections. The objection was raised that the employees of the Board provide connections to the un-authorized colonies. It was suggested that the penalties should be imposed on consumers in un-authorized colonies and employees of the Board should restrain themselves from providing such connections.

Board's reply:

Construction of houses in unauthorized colonies should have been restricted at the initial stage only by local bodies, if it is illegal according to their laws. But local bodies normally allow them to construct and then regularize them. This process itself is self-defeating. Once the houses are constructed and owners start residing, their lives and property need to be protected. Electricity is a basic amenity of life. The Board has also decided to allow the use of electricity with some penalties for their illegal action. The same may be continued.

Commission's view:

The matter is not related to tariff. Illegal construction of houses should be checked by local authorities and not the Electricity Board. The Board as per EA, 2003 has an obligation to provide electricity connection to any consumer who asks for it.

Issue No.22: TOD tariff

A number of Industries / Associations raised objections on the proposal of CSEB for amending the existing TOD tariff. The Board introduces TOD tariff with a view of encouraging use of power available in surplus during the off-peak hours and restricts the use during peak hours. The objections raised were as follows:

- In the proposed TOD tariff the rate during peak hours has been reduced from 130% to 125% but increased from 80% to 85% in off-peak hours. There was demand to maintain the present structure.
- The TOD tariff should be made applicable to all industries irrespective of their nature and category, with the view to utilize the surplus energy available in off-peak hours and restrict the use during peak hours.
- At present, the TOD tariff is not granted to industries having captive power generation. Several industries of continuous process nature are required to keep stand-by diesel generators for emergency use and, therefore, demanded to remove the restriction on opting for TOD tariff.
- TOD tariff may also be applied to LT industries.

Board's reply:

As suggested, the TOD tariff during peak hours may be increased to 130% but should not be reduced below 85% in off-peak hours, as power is not available even during off-peak hours in the state. The TOD tariff has been designed on the basis of power purchase during evening peak load hours and night peak load hours. The Board requires special type of meters to provide TOD tariff to L.T. consumers. It is not possible for the Board to provide such meters immediately. Therefore, TOD tariff has not been proposed for L.T. industrial consumers.

Commission's view:

The Commission, after hearing both sides, has come to the conclusion that the TOD tariff may not be possible for LT industry at this stage but may be considered in future. It is also decided that the TOD tariff during off-peak hours can be kept at 80% of the energy charges during normal period.

It is also decided to keep peak hours TOD tariff at 130%, so as to provide some incentive for the industry to run operations during off-peak hours which will help reduce the gap between peak and off-peak demand.

Issue No.23: Coal stacking and handling losses

The industries associations have objected to the coal stacking and handling losses being assumed as 4% for Korba (E) and 3% for Korba (W), which amount to 2.41 lakh tonnes of coal or Rs.15.37crore. It was also pointed out that Board has assumed zero loss in transport. Their view was that cost of coal includes handling charges, taxes, etc. and hence should not be taken separately.

Board's reply:

The provision of stacking and handling charges is on estimated basis. But these estimates have been made on the basis of experience, therefore, are near to the reality. CSEB does not have equipments to measure exact losses. But with various other methods, these can be assessed and accordingly have been provided by the Board.

Commission's view:

The Commission has permitted the coal stacking and handling losses for the Korba(E) and Korba(W) at 3% and 2% respectively as the Board has not provided any transportation loss. The Board must make serious effort to reduce these losses.

Issue No.24: Cross subsidies

The Commission received objections from the various industries and their representatives regarding the cross subsidies. The important points raised by them are:

- The burden of cross-subsidy on industries should be reduced. It was suggested that the present burden of cross-subsidies being met by industries should be partly met by the Government and remaining by the Board.
- It was also pointed out that the State Government has not given any commitment for providing external (Government) subsidy to subsidized categories like weaker sections. The State Government should indicate the same, so that there is minimum possible burden of cross-subsidy on industries and weaker sections of society also get power on cheaper rates.

Board's reply:

The present electricity tariff for domestic category is subsidized and as per the Electricity Act, 2003, the cross-subsidy has to be reduced gradually. Even with the proposed increase in tariff for the domestic consumers, the tariff in Chhattisgarh would be low as compared to tariff in near-by states.

Commission's view:

The Commission has tried to rationalize the tariff as per the tariff philosophy discussed in Chapter 3. The Board's argument regarding the domestic tariff that it is still lower than other states is not acceptable as the cost of supply of power is different in each State. The State Government has already been footing the bills of 15 units each for SLP consumers. The cross subsidy will be reduced gradually.

Issue No.25: Bulk discount

The CSEB does not provide any adequate discount to bulk consumers and has only proposed slightly reduced tariff for 'Bulk Consumers' in its petition. The SEBs in neighboring States do provide discount to such bulk consumers. The Board should offer the bulk discount as follows:

Unit Consumption	Bulk Discount
Above 4 lacs but less than 8 lacs	3%
Above 8 lacs but less than 12 lacs	4%
Above 12 lacs	5%

Board's reply:

Discount at higher load factor is already inbuilt in the Board's proposed tariff structure. Hence, no separate discount to bulk consumers is required.

Commission's view:

The Commission has made provision for suitable discounts based on load factor for the HT industries.

Issue No.26: Bad debts

Industries representatives / Associations objected on the provision of Rs. 72 Cr. (about 2.5%) for bad debts. It was suggested that the Board should give explanation along with details of such bad debts, steps taken to recover the same and justification to write off such debts. Their view was that it should not be more than 1% of total outstanding receivables. It was also informed that in other States, the provision made by Commissions for Bad Debts is as follows:

M.P	=	Rs. 25 Cr.
A.P	=	1%
Gujrat	=	0.4%
Orissa	=	2.5%

They pleaded not to allow bad debts more than 1%.

Board's reply:

As per the accounting practices in vogue in the then State of Madhya Pradesh, provision to the tune of 2.5% of the revenue demand used to be made each

year as provision for bad debts. Even AG's audit used to permit this percentage. There are many old cases, where the large amount is lying unrecovered for years in spite of best efforts of the Board to recover the same. To settle the old cases, more than Rs.72 crores shall be required.

Commission's view:

It is no use keeping large un-recoverable amounts in the accounts books. This does not mean that the Board should write off the amounts without making efforts for recovery of just demands. Fictitious demands should, however, be removed from the books of accounts. In view of this, the Commission is allowing the amount as asked for by the Board. The Board shall furnish the list of amount written off during the year 2005-06 in the next tariff filing.

Issue No.27: Provision for 1 lakh SLP Connections and 25000 agriculture pumps.

It was pointed out by Industry Association that in the petition, the Board has indicated that 1,00,000 SLP connections and 25000 agriculture pumps would be added during the FY-06, as per the directive of the State Government. But no provision has been made by the Government to provide grant for the capital works required for these connections.

Board's reply:

The expenditure incurred for providing SLP connections, is not large. For electrification of agriculture pumps, the Board has been incurring expenditure to the tune of Rs.30,000/- for each pump and the remaining cost of work is borne by the State Government.

Commission's view:

The Board is advised that the issue may be discussed in details and clear written settlement be made with the Government for carrying out capital works of connections of both SLP and agriculture pumps.

Issue No.28: Installation of capacitors.

Industries representatives pointed out that if an industry remains closed but capacitors remain 'on', then heavy billing is done even without much consumption (obviously on account of leading P.F.), causing unnecessary burden, for which remedy should be provided.

It was also pointed out that if capacitors of prescribed rating are provided by L.T. consumers for a particular load, then there should be no necessity to measure P.F. and levy of P.F. surcharge.

Board's reply:

Capacitor is supposed to be installed between the switch and the load so that with switching off the load, capacitor will get automatically switched off. If the

consumer does not follow the correct procedure and keeps the capacitor on even without load, he should be liable to pay such charges for extra consumption because he is deliberately wasting electricity.

Apart from providing capacitors, consumer should keep a watch on the capacitors to see if they are effectively improving the power factor.

Commission's view:

The Commission agrees with the Board. The purpose of installation of capacitors is to effectively improve the power factor of the installation and also the network. The consumer is benefited in many ways along with the saving in the bill if the power factor is effectively improved.

Issue No.29: Power factor incentives and penalties

The Commission has received objections regarding the P.F. incentives and penalties, as follows:

- The present tariff provides penalty for low power factor less than 0.9 and incentive if it is more than 0.95.
- At present there is no incentive for the P.F. in the range of 0.90 to 0.95. Incentive should be provided whenever P.F. is above 0.90.
- The rates of penalty for low P.F. are very high compared to the incentive of high P.F. The rates of penalty and incentive should be rationalized to justify the investment for installing the capacitors to improve P.F., that greatly benefits the Board.
- For LT industrial consumers no power factor incentive is provided, but they are penalized for P.F. less than 0.85 even after the capacitor is installed.
- The LT industrial consumers are supposed to pay surcharge if capacitors are not installed, although the P.F. is above the level of 0.85.

Board's reply:

The power factor incentive and surcharge have not been provided in the tariff design for HT consumers as the tariff is proposed to be fixed on KVAh basis, which includes the power factor incentive. If the consumer maintains the power factor of one, then the tariff in KVAh would be same as KWh. The provision cannot be applied to LT industrial consumer as the KVAh meters are not installed at LT consumer's premises and it is not possible to install the meters immediately, therefore, the power factor incentive and surcharge has not been proposed for LT industrial consumers.

In case, capacitors are not installed by LT consumers then the power factor cannot be higher than 0.85. Therefore, in the proposed tariff, power factor surcharge is proposed for the consumers not having capacitor in their industry. The electronic meters display the power factor and it is expected that consumer will see that power factor does not go below 0.85.

Commission's view:

The Commission on consideration of the objection as well as the reply from the Board accepts the Board's argument. KVAh billing provides inbuilt incentive to the HT consumers. However, the KVAh billing has only been considered for Railway Traction in this order. Based on experience of Railways, this may be introduced in other HT categories in future. The prevailing power factor incentive/ disincentive shall continue for other HT categories.

The LT consumers have the benefit of controlling their power factor through electronic meters. If 0.85 power factor is not attained then there has to be some discrepancy in their capacitors/ operations, which should be improved.

Issue No.30: Issues of Bhilai Steel Plant (BSP)

A separate presentation was made by BSP on 15-04-2005 during public hearing at Bhilai. The salient issues raised by BSP were as follows:-

1. Demand charges should be Rs.200 per KVA in line with WESCO (Orissa), wheeled power to be deducted from Billing Demand. The demand from the township should also to be deducted from Billing Demand.
2. Billing of demand charges should be against actual demand and not on contract demand.
3. CSEB has framed tariff structure based on 37% T&D losses.
BSP is taking single point bulk supply at 220KV/132KV level, losses at this level are marginal, yet distribution losses are also being borne by BSP. A substantial concession should be given to BSP on energy charges.
4. There should be load factor based energy tariff.
5. The BSP township is fed from HT connection of the plant. The township (with average 21 MW load) is having connections for different domestic, commercial, flour mills and Government offices. There are many non-BSP consumers in the township. BSP's request is that the township (without any denotification) be considered at par with any other Municipal Corporation / Licensee in respect of domestic, street light, waterworks and commercial categories in the new tariff proposal. Discount should be given for non-BSP consumers, so that they can be charged at par the domestic consumers of CSEB.
6. Energy charges for BSP mines to be at par with the tariff for coal mines.
7. Power factor incentive should be continued and PF incentive should be enhanced to Rs.5.5/KVA per 1% rise above 95% (in line with the penalty for low PF). The incentive should also be introduced for energy conservation.
8. The introduction of the incentive / penalty specially in respect of third harmonic and total harmonic distortion (norms to be formulated) to be introduced.

9. Compensation of losses incurred by BSP due to grid disturbances attributable to CSEB to be considered.

Board's reply:

The point-wise reply on objections of the BSP are as follows:-

1. Charges can not be compared with other States. Separate connection for township has not been taken, therefore, there is no question of reduction of demand of the township.
2. Billing of demand charge as per actual recording is not possible in view of prevailing tariffs and agreement.
3. Separate principles of framing tariff for BSP can not be applied.
4. This point has already been kept in view while designing their tariff structure.
5. BSP has been advised many a times to take a separate connection on General Purpose Tariff for township, which is cheaper.
6. In the existing tariff, Coal Mine tariff is applicable only to coal mines of Coal India Limited.
7. Power factor incentive above 0.95 power factor is available in present tariff. BSP has suggested different pattern of incentive which is for consideration of the Commission.
8. The limits of harmonic distortions have been defined in the agreement executed with the Railway. The measurements of the harmonics is not easy and therefore, except insisting for installation of harmonic filters or SVC, Board has not thought for incentive/facility. This would require technical deliberations.
9. Board tries to keep the grid disturbances under permissible limits. In the integrated system, the grid disturbances are caused due to some operations/ incidents which are beyond the control of the Board.

Commission's view:

The Commission generally agrees with the Board's reply. Better power factor has a good effect both on demand and energy consumption and therefore the present rate of incentive shall continue.

Issue No.31: Issues of Railways

The Railways also made a separate presentation to the Commission on 23/04/2005. The presentation included general comments on the ARR and tariff petition and issues concerning tariff for the Railways. The salient issues raised by them are summarized below:-

- CSEB should improve generation performance to reduce reliance on costly power purchase and passing on the benefits to the consumers through lower tariff.

- The cost of power purchased from traders as projected by CSEB should not be allowed.
- R&M expenses proposed as 11% of GFA for generation and at 6% of GFA for transmission and distribution are very high.
- Employees expenditure and A&G are very high compared to others States.
- Depreciation @ 4.6% of GFA for generation and 7.5% of GFA for transmission and distribution is high compared to CERC norms.
- Interest paid on new market borrowing (31% for transmission and 15% for distribution) is abnormally high.
- CSEB's petition is silent in the matter of collection efficiency which should be fixed by the Commission.
- Only variation in the fuel cost should be a pass through under fuel surcharge formula, but not the variation in the fixed cost and other uncontrollable cost.
- The average billing rate for Railways (including FCA) works out to Rs. 4.46/kwh, is very high and needs to be reduced.
- Effective tariff for Railway Traction proposed to be reduced from Rs. 4.25/kwh to Rs. 4.19/kwh (1.5%) is grossly inadequate and should be further reduced significantly.
- For Railway staff quarters and individual occupants the rate should be charged on the basis of lower tariff applicable to normal consumers of CSEB.
- Monthly minimum charges for Railways equivalent to 25% load factor at 0.85 PF, should not be levied.
- Railways should not be penalized for attempting to achieve a power factor of unity in the process of supplying leading KVARh to the system and leading power factor should be blocked.

Board's reply:

Railway has been separately pursuing the CSEB for the rationalization of tariff and for not levying the penal charges for exceeding the maximum demand. The issue was discussed between both the parties in details and based on the discussions, the Board has formulated a tariff and has proposed the same in this petition. The proposed tariff has been made on the basis of billing on KVAh. This automatically takes care of incentive and penalties for the high and low power factor respectively.

Commission's view:

The Commission on consideration of the objection as well as the reply from the Board, accepts the Board's argument as KVAh billing provides inbuilt incentive on account of power factor. The billing on KVAh is being considered for Railway Traction in this order. The Commission has considered their request regarding a cheaper power for their colony. The Commission has designed a separate HT tariff for the residential colony.

LIST OF PERSONS WHO SUBMITTED WRITTEN OBJECTIONS TO THE COMMISSION

S.No.	Name and Address of the party	Category
1	Environment Energy Foundation, Raipur	N.G.O
2	Chhattisgarh Chamber of Commerce & Industries, Raipur	Chamber of Commerce & Industries
3	Shri Tarun Chaterjee	Political Party / Ex Minister
4	Shri Dinesh Yadav, B.D. Mahant Upnagar, Janjgir, C.G. 495668	Individual
5	Urla Industries Association ,Raipur	Industries Association
6	Shiva Metal and Mineral Industries, Durg	Industry
7	Chhattisgarh Mini Steel Plant Association, Raipur	Industries Association
8	Shri S.C. Tripathi, DGM (Power System and Management Cell), SAIL, BSP, Bhilai	Bhilai Steel Plant
9	Chhattisgarh Udyog Mahasangh, Punjabi colony, Katora Talab, Raipur	Industries Association
10	Shri Praveen Das, Advocate, High Court, Shubham Vihar, Mungeli Road, Bilaspur	SECL (Coal India)
11	Jayaswal Neco Ltd., Siltara Growth Centre, Siltara, Raipur	Industry
12	Dhamtari Rice Mill (Owner) Association , Regd Office: R.L. House, Behind Bus Stand, Dhamtari-493773 (C.G.)	Industries Association
13	R.L. Agrotech Ltd., Regd. Office: R.L. House, Industrial Area, Dhamtari(C.G.)-493 773	Industry
14	Shri Bijuraj, State Bank Of India, Aturgaon (C.G.)	Individual
15	Shri Sanket Verma, Bhatapara	Individual
16	Agrawal Structure Mill Pvt. Lt d., Agrawal Sponge Pvt. Ltd., Urla Industrial Area, Raipur	Industry
17	Shri Anjum Alvi, Executive Director, Indian Abbes Dairy farm, Baldevbag- Rajnandgaon	Non-Domestic
18	Shri Bahadur Ali, Member-Central Poultry Development Advisory Council, Indian Poultry, Baldevbag , Rajnandgaon	Poultry
19	Shri Ram ji Bhai Patel, President, Chhattisgarh Timber Vyapari Sangh, Timber Bhawan, Devendra Nagar, Raipur	Industries Association (Saw Mill)
20	Chief Electrical Engineer, South East Central Railway, Bilaspur.	Railway
21	Ms.Neeta Jain, Advocate, Qt.No.7, Mahaveer Nagar, Durg	Individual
22	Shri Ramesh Khandelwal, Chief Executive Officer, Standard Chrome Ltd., Raigarh	Industry

23	Adarsh Ispat Udyog (P) Ltd. Supela, Bhilai	Industry
24	Shri K.S.R. Murty. GM(Electrical) Representative of BSP, Bhilai.	Bhilai Steel Plant
25	Shri A.P. Khetan, Uniworth Limited, Urla, Raipur	Industry
26	Shri Prabhat Meghwale, Member, Advisory Committee, CSERC, C-312, Sector-6, Vallabh Nagar, Raipur	Consumer
27	Chhattisgarh Cement Manufacturing Association, Century Cement, 21/470 Civil Line Raipur.	Industries Association
28	Shri Santosh Agrawal, President, Chhattisgarh Mini Steel Plant Association, 10, park Road, Choubey Colony, Raipur	Industries Association
29	Shri K.K. Agrawal, President, Chhattisgarh, Steel Re-Rollers Association, 1st floor, Sona Tower, Opp. Deshbandhu Press, Ramsagarpara, Raipur	Industries Association
30	Shri P.N. Singh, President, Chhattisgarh Vidyut Mandal Abhiyanta Sangh, M-9, Krishna Nagar, Dangania, Raipur.	Employees' Association
31	Shri Umesh Agrawal, President, Chhattisgarh Master Printers Association, M.G. Road, Raipur	Printing Press Association
32	Chhattisgarh Federation of Industries, 8-B, Industrial Estate, Bhanpuri, Raipur	Industries Association
33	Shri P.P. Kartha, Qtr. No. 656, Punjabi Colony, Katora Talab, Raipur	C.I.I.
34	Shri Mukesh Kakkar, Chairman, Chhattisgarh Udyog Mahasangh, Raipur.	Industries Association
35	Shri Subhro Banerjee, Head, Chhattisgarh Confederation of Indian Industries, Raipur	Industries Association
36	Jointly from Chhattisgarh Ferro Alloys Association, Jain Carbide and Chemical Ltd., Indsil Energy & Electrochemical, Ltd. Raghuvir Ferreo Alloys Pvt. Ltd. , Shri Girja Smelters Ltd., Srinivasa Ferro Alloys Ltd. , Saturn Ferro Alloys Pvt. Ltd., Alok Ferro Alloy Ltd.	Industries Association
37	Shri Shyam Kabara, Chairman, Urla Industries Association, Raipur	Industries Association
38	Shri Vivek Ranjan Gupta, Secretary, Raipur Wire Drawing Association (SSI), Raipur	Industries Association
39	M/s Aditya Biotech Lab and Research Pvt. Ltd., Chhotapara, Raipur	Bio-Tech. Lab
40	Shri Shailendra Jain , Shrishrimal Plantation Limited, Raipur	Plantation
41	Shri M.K. Gupta, Sr. Divl. Elect. Engineer, (TRD.) East Coast Railway, Waltair	Railway
42	Shri E. Raja Rao, Managing Director, Sudha Agro Oil and Chemical Industries Limited, East Godavari District (A.P.)	Industry

43	Chhattisgarh Bijlee Majdoor Sangh, Shramik Sanskar Sadan, CSEB Colony, Korba	Employees' Association
44	Shri Hanuman Prasad Agrawal, Secretary, Korba Imarti Lakadi Laghu Udyog Sangh, Main Road, Korba	Industries Association (Saw Mill)
45	Shri Vikram Goyal, Secretary, District Fly Ash Bricks Association, Korba	Industries Association
46	Shri P.K.Bakshi, MIG-1/14, MP Nagar, Korba	Individual
47	Shri R.L. Arora, Korba	Individual
48	Shri Rajkumar Agrawal, President, Chhattisgarh Chamber of Commerce & Industries, Link Road Bilaspur	Chamber of Commerce & Industries
49	Shri Sanjay Kumar Agrawal, Director, Rukmani Power & Steel Ltd., Bilaspur	Industry
50	Shri Harish Kedia, Chhattisgarh Laghu Udyog Sangh, Tifra Industrial Area. Bilaspur	Industries Association
51	Shri Purushottam Bhai Patel, President Bilaspur Timber Vyapari Sangh, Mungeli Road, Bilaspur	Industries Association (Saw Mill)
52	South East Central Railway, Bilaspur	Railway
53	Shri S. Malviya, NC-178, CSEB, A/B Type Colony, Korba. (East)	Individual
54	Shri M.Soni, Professor Colony, Raipur	Individual
55	Consumer Conservation Association, Jagdalpur	N.G.O
56	M/s M.K.Re-roller Mill, Tedesara	Industry
57	Rungta Re-rolling Mill, Dewada	Industry
58	Adarsh Ispat Udyog Pvt. Ltd., Tedesara	Industry
59	Orient Steel Re-rolling Mill, Tedesara	Industry
60	Bhilai Structural Steel Re-rolling Mill, Bhilai	Industry
61	P.S. steel Tubes Pvt. Ltd., Bhilai	Industry
62	Bhilai Wire Drawing Industries Association, Bhilai	Industry
63	Bhilai Yuva Vyapari Sangh, Bhilai	Consumer Association
64	Shri Vinay Madan, President District Yuvak Congress (Tribal) Rajnandgaon	Political Party
65	Bhartiya Janta Yuva Morcha, Central Bastar, Jagdalpur	Political Party
66	Jay Prakash Memorial Center, Baster Division, Kirandul (C.G.)	N.G.O
67	Shri Ramesh jain, National Consumer Congress, Raipur	N.G.O
68	Shri Mohan Anti, Advocate, Raipur	Individual
69	Shri Shyam Kabra, Chairman, Low Tension Consumer Sub-Committee, Raipur	Industries Association

Chapter 5: Annual Revenue Requirement for FY06: Licensee's Proposal and Commission's Analysis/Observations

5.1 Background

In its ARR/Tariff Petition submitted to the Commission on 01.03.2005, the CSEB has furnished disaggregated data for the generation, transmission and distribution functions. Although, as per the earlier directive by the Commission, the consolidated ARR has also been furnished, but it is only an aggregation of the disaggregated data and the ARR/ retail tariff has been worked out, taking into account the sale of power by the generating units to the distribution functionary. The cost of wheeling of power by transmission functionary has been added to the cost of generation taking into consideration the transmission losses. In the ARR/Tariff Petition of 01.03.2005, some of the parameters and data furnished earlier have been modified. Even thereafter, frequent changes in the data were made by the Board during technical validation, particularly in the matter of projected energy sales for FY06, resulting in higher power purchase. This only reveals a total lack of management information system in the Board for monitoring operational and financial performance at the Board's level. However, the Commission has considered the Board as a vertically integrated entity, which it presently is. If the Board is unbundled into separate companies for generation, transmission and distribution during the year, separate ARR/Tariff filing will be required to be submitted to the Commission in the next tariff petition.

5.2 Operational parameters

The Commission is in the process of finalizing the regulations laying down the terms and conditions of tariffs, keeping in view the CERC's regulations on terms and conditions of tariff of 26.03.2004 (for generation and transmission). These regulations will include, inter alia, the normative parameters of operations of generating stations, and of transmission and distribution. The normative operational parameters shall be those at which the utility shall recover the full capacity (fixed) charges. Performance above the normative levels shall attract prescribed incentives and performance below the normative level shall attract prescribed penalties. Introduction of availability based tariff shall also be considered in the proposed regulations. Pending the finalization of these regulations, the targets of various operational parameters are being fixed for FY06, keeping in view the past performance and the norms fixed by the CERC.

5.3 Generation

The ARR of generation function for the current (FY05) and ensuing (FY06) years and actual for FY04 as presented by the Board, is as given below:

(Rs. in Crore)

Generation	FY04 Actual	FY05 Estimated	FY06 Projection
Expenditure:			
<i>Generation Cost (Fuel Cost only)</i>	394.07	427.60	575.20
<i>R&M Expenses</i>	96.49	132.92	132.92
<i>Employee Expenses</i>	219.07	183.07	123.22
<i>A&G Expense</i>	*	6.99	7.41
<i>Depreciation</i>	16.65	39.44	54.33
<i>Interest and Finance Charges</i>	41.65	119.57	270.6
<i>Less: Interest and other expenses capitalized</i>	-	36.02	121.95
<i>Other Debits (Including Provisions for Bad debts)</i>	0.07	0.36	.45
<i>Other (Misc.) – net prior period credit / Tax</i>	9.03	30.98	36.02
Total	774.60	904.90	1078.19
Reasonable Return	-	53.32	62
Other Income	22.46	32.97	33.35
Annual Revenue Requirement	752.14	925.25	1106.84

* Rs. (-2.45) crore due to negative balances of incidental store expenses.

The increase projected in FY06 is not only in the generation cost and R & M expenses, but also in other items like interest and finance charges, etc., which are very high. It is also seen that the expenditure in FY05 is on estimated basis and not based on actuals of at least 6 to 9 months of the current year. The item wise observations are given below:

5.3.1 Operational Parameters of the generating stations and projections for FY06:

Korba (East) Phase-II (4X50 MW)

The performance parameters of Korba (E) II in respect of PUF, generation and auxiliary consumption are given below.

Units of Korba (E) II are nearly four decades old. The PUF and auxiliary consumption has been low in FY04 as the units I and IV were under refurbishment. The PUF projected for FY06, after considering that the

units have been refurbished, is reasonable. However, the auxiliary consumption projected at 10.25% is high but is being accepted for FY06.

Generating station	FY04 Actual	FY05 Estimated	FY06 Projection	FY06 Approved
Plant Utilization Factor – PUF (%)	62.95%	80.00%	80.00%	80.00%
Gross Generation (MU)	995	1,402	1,402	1,402
Auxiliary Consumption (%)	11.51%	10.54%	10.25%	10.25%
Net Generation (MU)	881	1,254	1,258	1,258

The Board should prepare a scheme to bring down the auxiliary consumption below 10% by the time of the next tariff filing.

Korba (East) Phase-III (2X120MW)

The performance parameters in respect of PUF, generation and auxiliary consumption of Korba (E) III are given in the table below.

The units of Korba (East) III are around 28 years old. Both the units have also been under refurbishment. Unit VI (120 MW) has been refurbished in October 2003, while Unit V (120 MW), which was under refurbishment since April 2004, and has been commissioned in March 2005 and is likely to stabilize in the next few months.

As both the units would be available for generation, the PUF is projected to go up to 80% in FY06 from 40% in FY05. However, there is no improvement projected in respect of auxiliary consumption for FY06.

Generating Station	FY04 Actual	FY05 Estimated	FY06 Projection	FY06 Approved
Plant Utilization Factor – PUF (%)	47.87%	40.00%	80.00%	80.00%
Gross Generation (MU)	1,009	841	1,682	1,682
Auxiliary Consumption (%)	9.81%	9.50%	9.50%	9.50%
Net Generation (MU)	910	761	1,522	1,522

The Board should prepare a scheme to reduce the level of auxiliary consumption to below 9.5% in future by the time of the next tariff filing.

Korba (West) (4X210MW)

The operating parameters (PUF and auxiliary consumption) of the units of this power station are given in the table below.

The PUF of Korba (W) power station in FY04 was 76.07%. In the revised petition, the Board had projected a PUF for FY06 at 78%. In a subsequent submission in April 2005, the Board has requested the Commission to keep the target PUF for FY06 at 74% only, keeping in view that the actual achievement in FY05 was 73.94%.

The Commission has, however, fixed the target of PUF for FY06 at 76% which was achieved earlier by the Board in FY04. The auxiliary consumption projected at 9.5% for FY06 is on a higher side. This is being accepted, subject to the condition that the Board shall make efforts to bring it below 9.5% by next year.

Generating Station	FY04 Actual	FY05 Estimated	FY06 Projection	FY06 Approved
Plant Utilization Factor – PUF (%)	76.07%	72.00%	78.00%	76.00%
Gross Generation (MU)	5,613	5,298	5,740	5,592
Auxiliary Consumption (%)	9.54%	9.75%	9.50%	9.50%
Net Generation (MU)	5,078	4,781	5,194	5,061

In the petition, the Board has indicated that these units are due for RLA study. The Board should ensure that these studies are completed in FY06.

Hydel Power Stations (Hasdeo Bango, Gangrel and Korba mini hydel)

The parameters of generation and auxiliary consumption of the above hydel stations are given below:

The Board has projected the net hydel generation during FY06 at 427 MU compared to estimated generation of 409.14 MU in FY05. Adding the nominal projected generation of 5 MU for mini micro HPS Korba (W), the total net hydel generation for FY06 is likely to be 432 MU. The auxiliary consumption is within the prescribed limit of 0.5%.

Parameter	FY04 Actual	FY05 Estimated	FY06 Projection	FY06 Approved
Gross Generation (MU)	295.56	410.00	428	428
Auxiliary Consumption (%)	0.21%	0.21%	0.21%	0.21%
Net Generation (MU)	294.93	409.14	427	427

5.3.2 Station Heat Rate- SHR (kCal/KWh)

The station heat rate is an important efficiency indicator of a thermal power plant. The station heat rate as projected by the Board for FY06 and the actual/estimated for FY04 and FY05 and as approved for FY06 by the Commission are given in the following table.

For Korba (E), the Board has proposed SHR as per guaranteed performance parameters after refurbishment of the units, with further allowances as per permitted operational deviations.

As regards the deviations from the guaranteed SHR for Korba (E) II and Korba (E) III, it is observed from the additional information furnished is that the guaranteed SHR for Korba (E) II is 2650 kCal/KWh, but the total valuation of the deviations is computed as +183 kCal/KWh, thereby bringing up the SHR to 2833 kCal/KWh. These are on a very high side due to high flue (exit) gas temperature, DM water(make up) consumption and CW inlet temperature w.r.t design parameters. Similarly, for Korba (E) III the deviations of +279 kCal/KWh on the guaranteed SHR are on higher side. On technical evaluation it was observed that corrections demanded for vacuum is not correct.. Taking into consideration the above factors, the Commission has approved the SHR for FY06, as given in the table below.

Further, for Korba (W), the SHR projected for FY06 is 2614 kCal/KWh, whereas in FY05 it was 2597 KCal/KWh and in FY04 2601 KCal/KWh. The Commission feels that for Korba (W) the SHR in FY06 should not be inferior to that in FY05 and approves the SHR for FY06 at 2600 kCal/KWh.

Generating station	FY04 Actual	FY05 Estimated	FY06 Projection	FY06 Approved
Korba (E) Ph-II	3160	3164	2830	2780
Korba (E) Ph-III	2933	2958	2659	2600
Korba (E) Total*	3046	3061	2745	2681
Korba (W)	2601	2597	2614	2600

** Average SHR is taken for FY 04, 05, & 06 (projected) while weighted average is taken for FY 06 (approved).*

5.3.3 Net Calorific Value (NCV)/GCV of coal

The Board has taken the NCV (kCal/KWh) of the coal for arriving at the quantity of the coal consumed, whereas, as per prescribed practice it is the GCV (gross calorific value) based on which coal consumption is to be arrived at. The CERC norms also prescribe GCV of the coal received minus GCV of the coal fired for finding out the heat loss in stacking/handling and for arriving at the quantity of coal consumed. The

NCV is the GCV less the heat of condensation or otherwise of any condensate below 100 degrees centigrade.

From the additional information submitted by the Board, the GCV of the coal received and GCV of the coal fired for Korba(E) complex are 3585 kCal/kg and 3444 kCal/kg respectively. Therefore the loss in stacking/handling comes to 141 kCal/kg. For Korba (W), the above values are 3636 and 3576 kCal/kg respectively. Therefore, the heat loss in stacking/handling there comes to 60 kCal/kg. The CERC norms prescribe the limit of stacking/handling loss at 100 kCal/kg. The Commission is of the view that normally the stacking/handling loss should be limited to the CERC norms, unless some allowance is made on justified grounds. The stacking/handling loss proposed by the Board at 4% for Korba (E) is very much on the higher side. The stacking/handling loss proposed at 3% for Korba (W) is not permissible as the actual heat loss for stacking/handling is coming within the prescribed CERC norms. The Board has assumed the transportation loss as nil, as transportation of coal at both the power stations is required to be done over a comparatively small distance of less than 20km. For the time being this is accepted with a slight change.

But the Board should carry out test checks for the quantity of coal at sending end and also at the receiving end. This calls for installation of weighing devices at the power stations for weightment of wagons and other sources of the coal transport. Looking to the above facts, the Commission fixes the maximum limits of stacking/ handling losses for Korba (East) complex at 3% and for Korba (West) at 2% over the quantity of coal fired and directs the Board to install weighing devices most urgently.

5.3.4 Expenses

(a) Specific Coal Consumption

The Specific coal consumption (kg/kWh) estimated for FY05, projected by the Board for FY06, and approved by the Commission for FY06 are given in the following table.

The specific coal consumption proposed by the Board is on the higher side. This is to be worked out based on the energy generated and SHR and working out the heat energy input of the power station. The quantity of coal consumed has been worked out from the GCV of the coal and not the NCV.

<i>Generating Station</i>	<i>(kg/KWh)</i>			
	<i>FY04</i>	<i>FY05</i>	<i>FY06 Proposed</i>	<i>FY06 Approved</i>
<i>Korba (E) Ph-II</i>	0.96	0.95	0.85	0.80
<i>Korba (E) Ph-III</i>	0.90	0.89	0.80	0.75
<i>Korba (W)</i>	0.78	0.76	0.76	0.72

(b) Quantity of Coal

The quantity of coal estimated for FY05 and projected for FY06 by the Board and approved by the Commission, based on the above approved SHR, are given in the table below:

(Lakh MT)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E) Ph-II	9.58	13.30	12.44	11.54
Korba (E) Ph-III	9.06	7.46	14.03	13.00
Korba (E) Total	18.64	20.76	26.47	24.54
Korba (W)	43.86	40.42	44.88	41.07
Board TOTAL	62.50	61.58	71.34	65.61

(c) Procurement cost of coal (Rs./MT)

The procurement rates of coal (Rs. /MT) ex- generating stations as presented by the Board are given below in the last column is the cost as approved by the Commission.

The rates are inclusive of siding charges, surface transportation, royalty, handling losses and applicable taxes charged by Coal India Ltd. (CIL). The Board has informed that the prevailing rates of coal were notified by CIL w. e. f. 15.6.04, which works out to Rs. 587 per MT ex- CIL. The landed cost of coal during FY05, as per the latest progressive details, indicate average rate of Rs. 610 per MT for Korba (W) and after giving allowance for reduction on surface transportation cost, Rs. 590 per MT for Korba (E). In the subsequent submission, the Board has given the revised figures of coal prices, supported by documentary proof from South-Eastern Coalfield Ltd. (SECL). The landed cost is estimated after considering transportation, siding charge, royalty, CST, etc. at Rs.618/ MT (rounded to Rs. 620/ MT) for F grade coal, in respect of Korba (W). Accordingly, the Commission has accepted the rate of coal for Korba (E) at Rs. 600/ MT and for Korba (W) at Rs. 620/ MT.

The Board has anticipated an increase of 10% in the cost of coal over the estimated cost for FY05 for projecting the cost in FY06. The Commission is of the view that the cost of coal (Rs. /MT) assumed for FY06 should be based on the rates prevailing at the end of FY05. Any variation in the cost of coal/other fuels during the FY06 has to be claimed through VCA formula approved by the Commission. The anticipated increase has, therefore, been disallowed.

Landed cost of coal (Rs. per MT)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	508.70	590.00	649.00	600.00
Korba (W)	561.00	610.00	671.00	620.00

(d) Estimated cost of coal

The projected total cost of coal for FY06 has been calculated based on the quantity of coal arrived at on the basis of specific coal consumption and rates as per the Commission's observations discussed above. The cost works out as under:

(Rs. Crore)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	94.80	122.46	165.10	147.41
Korba (W)	246.05	246.58	292.35	254.80
Board Total	340.86	369.04	457.54	402.21

(e) Specific furnace oil consumption

The specific furnace oil consumption (ml. /KWh), as projected by the Board for FY 06 is given below.

The standard set by CEA/CERC for specific oil consumption for coal based generating station is 4.5 ml/kwh during stabilisation period and 2.0 ml/kwh in subsequent period.

Although specific oil consumption of Korba (E) is within the above limit, it is still higher than of Korba (W). The reason is said to be the inferior technology of Korba (E). However, after refurbishment of the units, particularly of Korba (E)- III, the oil consumption should reduce.

In Korba (W) the specific oil consumption is said to have been recorded 1.18 ml./KWh in December 04. The Board has estimated it to be 1.20 ml./KWh for FY05 but expects it to go down to 0.99 ml./KWh in FY06. The Commission has, therefore, approved the specific oil consumption for FY06, as mentioned in the table.

(ml/KWh)

Generating Station	FY04	FY05	FY06 Proposed	FY 05 Actual	FY06 Approved
Korba (E) Ph-II	4.52	3.15	2.00	1.85	2.00
Korba (E) Ph-III	3.00	2.72	2.39	3.55	2.39
Korba (W)	0.94	1.20	0.99	1.27	0.99

However, the Board should make efforts to reduce the specific oil consumption further during FY06.

The furnace oil consumption figures based on the above projections made by the Board and as approved by the Commission are given in the following table:

(kl)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	7,522	6,702	6,823	6,823
Korba (W)	5,296	6,358	5,682	5,536
Board Total	12,818	13,060	12,505	12,359

The furnace oil consumption for Korba (E) is higher in FY06 as compared to FY05 because of increase in generation resulting from refurbishment of units.

(f) Furnace Oil procurement rates

The applicable rates for procurement of furnace oil from M/s IOC are given in the following table.

The rates (Rs./kl) include temperature variation allowance (TVA), railway freight, siding and shunting charges and applicable taxes/cess. The higher rate recorded at Korba (E) in FY04 is said to be due to higher handling charges and charges incurred by the Board for decanting furnace oil. But this is not anticipated in the subsequent period.

As per the Board's supply order dated 22.12.04 on IOC, the revised rate (landed cost) w. e. f. 1.11.04 has been set at Rs. 13450 per kl, which has been considered for FY05. The Board has envisaged a 10% increase in the rates for FY06 and accordingly considered it as Rs. 14,795 per kl, which is not acceptable. The last valid rate prior to 01.04.2005 as per contract with the oil company, has to be assumed for FY06 and any escalation in the rate is to be claimed through VCA. Accordingly, the Commission has approved the rate of furnace oil for FY06, as mentioned in the table:

(Rs./kl)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	13,561	13,450	14,795	13,450
Korba (W)	13,413	13,450	14,795	13,450

(g) Cost of furnace oil

The cost of furnace oil as projected by the Board and as approved by the Commission for FY06, is as follows:

(Rs. Crore)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	10.20	9.01	10.09	9.17
Korba (W)	6.96	8.55	8.41	7.44
Board Total	17.16	17.57	18.50	16.61

(h) Specific consumption of HSD

HSD is mainly used as a fuel only during startup of furnaces, and hence its consumption is very small as compared to furnace oil. For arriving at the quantity of HSD consumed, specific consumption has been considered from the historical data and multiplied by the gross generation. The specific consumption of HSD projected by the Board and approved by the Commission is given below:

(ml/KWh)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E) Ph-II	0.00	0.00	0.00	0.00
Korba (E) Ph-III	0.29	0.21	0.14	0.14
Korba (W)	0.45	0.33	0.26	0.26

Korba (E) II does not use HSD as a starter fuel. In Korba (E) III and Korba (W), reduced specific HSD consumption in FY06 is due to increased generation.

On the basis of the above specific consumption, the quantum of HSD consumption as projected by Board and as approved by the Commission, is given below:

Quantity of HSD (kl)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	291	177	235	235
Korba (W)	2528	1748	1492	1454
Board Total	2819	1925	1727	1689

The HSD consumption for Korba (E) is higher in FY06 as compared to FY05 because of increase in generation resulting from refurbishment of units.

(i) Procurement rate of HSD

The landed cost of HSD (Rs./kl.) as presented by the Board is as given below.

The last supply order dated 22/12/04 (effective from 1/11/04) was placed by the Board on IOC, based on which the rates are considered for FY05. For FY06, Board has assumed a hike of 10% in the rate prevailing in FY05, which is also not acceptable. The rate prevailing at the end of FY05 should be assumed for FY06 and any variation in the rate during FY06 has to be claimed through the VCA formula. The Commission has therefore, approved the rates of FY 05 for FY 06 as indicated in the last column of the table:

Landed cost of HSD (Rs./kl)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	22,106	26,326	28,958	26,326
Korba (W)	22,309	26,310	28,941	26,310

(j) Cost of HSD

The total cost of HSD, as projected by the Board, and as approved by the Commission, is given below:

(Rs. Crore)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	0.64	0.46	0.68	0.61
Korba (W)	5.64	4.60	4.32	3.82
Board Total	6.28	5.06	5.00	4.43

(k) Overall secondary fuel oil (Furnace oil + HSD) Consumption

Overall secondary fuel oil consumption (Furnace Oil and HSD) for FY06 is allowed as follows:

- 2ml/ kwh for Korba (E) II,
- 2.53ml/kwh for Korba (E) III and
- 1.25 ml/kwh for Korba (W).

(l) Cost of water

The cost of water for use in the Board's thermal power stations and also for its hydel stations is given below.

The cost of water consumed in thermal stations should be covered under O&M charges. The Board has, however, accounted it as a separate expense. The Commission has accepted this but with the

direction that from the next year it should be included under the O&M expenses.

The royalty paid to the State Government for use of water in hydel stations is accepted as proposed. However, the rates fixed by the State Government for water supplied to the thermal power stations and the rate of royalty fixed for hydel stations as per last rate fixation order, has to be assumed for FY06 and any escalation in the rates during FY06 has to be claimed through VCA. Accordingly, the Commission has approved the cost of water for FY06 as mentioned in the table:

(Rs. Crore)

Generating Station	FY04	FY05	FY06 Proposed	FY06 Approved
Korba (E)	1.85	1.82	1.95	1.82
Korba (W)	2.67	3.58	3.60	3.58
Hydel	4.72	6.78	7.08	6.78
Board Total	9.24	12.18	12.63	12.18

(m) Cost of lubricants, consumables and chemicals

These costs are included in the R & M expenditure and hence are disallowed.

(n) Electricity duty (ED) and cess

The correct amount of ED and cess on generation comes to Rs. 18.86 Crore as against Rs. 24.38 Crore projected by the Board for FY06 and has been approved as such.

(o) Overall variable cost (fuel cost)

According to the above parameters approved by the Commission the total variable cost (fuel cost) for generation in FY06 comes to Rs. 454.26 Crore

5.3.5 Operation and Maintenance (O&M) expenses (Generation)

The actual data compiled from trial balances for FY04, estimated expenses in FY05 on the basis of FY04, and projections for FY06 are given in the table below.

The major heads of O&M expenditure are discussed below:

(a) Cost of employees

The cost of employees consists of salary, wages, DA and other allowance and also discharge to Pension Trust, employer's contribution to gratuity fund, etc. The Board has initially projected employee cost of Rs.123.22 Crore in the ensuing year which includes Rs. 11.42 Crore for

gratuity fund @ 12.5% per annum on salary and DA. The Board has assumed 15% increase in salary and DA.

The Board has, however, in the submissions made later, changed the consolidated employees cost (combined for Generation, Transmission and Distribution) at Rs. 484.58 Crore against the earlier proposal of Rs. 399.38 Crore for FY 06, due to inclusion of 60% of additional pension fund liability of Rs. 142 Crore. The Commission has allowed inclusion of only 50% of this liability this year as against 60% requested by the Board, thus allowing the employees cost at Rs. 470.38 Crore for FY06 as against Rs. 484.58 Crore proposed by the Board.

As per corresponding change in the generation function, the employee's cost is allowed at Rs. 145.38 Crore for FY06. The Commission has allowed other employee expenses as indicated by the Board.

The number of employees per MW installed is 4.18. The employee's cost as a percentage of the cost of generating one unit is hence very high at 16.89%. The break up of the employees into technical, operational and other staffs has not been furnished by the Board. Therefore, the pattern of engagement of this large staff is not available to the Commission. By all accounts the number of employees is very large, even if allowance is given to the age of the plants. The Board should make efforts to reduce the staff to at least 3 per MW and redeploy the surplus staff in the new plant of 500 MW being set up at the same place.

(b) Repair & Maintenance (R & M) Cost

The R & M cost for the current year (FY05) is estimated by Board at 11% of the Gross Fixed Assets (GFA) on the plea that the generation plants are old and need substantial R & M work due to ageing. The cost assumed by the Board on ad hoc basis is unacceptable. The CERC has fixed a norm of 2.5% of the GFA or Rs. 10.82 Lakh per MW for total O&M expenses including R & M for year FY 06. However the 2.5% norm, applicable to new stations, can be increased annually by a percentage based on the variation in the consumer price index. The explanation given by the Board that higher R & M expenses for FY05 are due to the fact that the refurbishment expenses for plants earlier scheduled for FY04 were actually incurred in FY05, is also not tenable as refurbishment expenses are capital expenses and cannot be covered under repair & maintenance work. In fact, due to refurbishment of all the units of Korba (E), there should be a lesser requirement of R & M works during FY05, apart from the fact that as per refurbishment contract, supply of some spares is also guaranteed.

Even if the projected R & M expenses for FY06 are to be considered based on the actual requirement, it has to be based on the actuals of FY04 and the actuals of part of FY05, and should have sufficient justification. The Commission has, therefore, assumed an escalation of

10% over the actual R&M expenses for FY04 on year to year basis and accordingly worked out the same as Rs. 114.95 Crore for FY06.

The consolidated R&M expenses (for generation, transmission and distribution) for FY06 are worked out at 5.7% of the gross fixed assets of Rs.2564 Crore i.e. Rs.145.38 Crore. This also matches with a 10% rise in expenses over FY04 figure.

(c) Administration and General (A & G) Expenses

Board has projected 6% increase in A&G expenses in ensuing year over the previous year. The expenses projected by the Board for FY06 are Rs.7.41 Crore. The Commission considers this a reasonable amount hence it is allowed.

Operation and Maintenance Expenses

(Rs. Crore)

	FY04 Actual	FY05 Estimated	FY06 Projection	FY06 Approved
Discharge to Pension Trust	127.31	75.92	24.88	22.16
Contribution to Gratuity	3.38	9.93	11.42	11.42
Other Employee Cost	88.38	97.22	111.80	111.80
Total Employee cost	219.07	183.07	148.10	145.38
Repairs and Maintenance Costs	96.49	132.92	132.92	114.95
Administrative and General Costs		6.99	7.41	7.41
Total O&M Costs	313.12	322.98	288.43	267.74

5.3.6 Interest and finance charges

The Board has estimated Rs.83.55 Crore in FY05 and Rs.53.06 Crore in FY06 as interest and finance charges. The Commission had asked for the details of interest paid in FY05. It was found on scrutiny that the Board has not raised any market borrowing in FY05. The interest liability has therefore, been reworked on the basis of the actual interest liability of the Board in FY05 and the projected borrowing in FY06. Since, there is no borrowing for working capital in FY05, hence the Commission disallows interest on borrowing.

The other finance charges include payment to State Government as provided in the State Government Budget, which has been disaggregated into each functional statement. Since no justification for

making this payment has been furnished by the Board, this has been disallowed.

The Commission, therefore, allows the interest and finance charges amounting to Rs. 47.94 crore in FY06.

(Rs. Crore)

	<i>As per Board FY05</i>	<i>As per Board FY06</i>	<i>Allowed by Commission for FY06</i>
Interest and Finance Charges	54.76	99.23	99.23
Interest on Working Capital	9.87	5.12	0
Other Finance Charges	54.93	4.95	4.95
Total	119.57	109.3	104.18
Interest Capitalized	36.02	56.24	56.24
Charged to Revenue a/c	83.55	53.06	47.94

5.3.7 Depreciation

The CERC has allowed depreciation on the coal based generating stations at the rate of 3.6% on the straight-line method. Since the new addition of fixed assets is due to refurbishment of the old units of Korba (E), and the refurbished units may not have the same useful life as of a new unit, the Commission has allowed depreciation at the rate of 4%, which is slightly higher than the CERC norms, on the new addition during FY05 and FY06 to fixed assets over the Gross fixed assets at the end of the FY04. Over and above this, the Commission has allowed actual depreciation as asked for by the Board on the existing assets at the end of FY05. The total depreciation allowed on new assets is Rs.13.25 Crore, whereas on the existing assets at the end of FY04 the depreciation amount is Rs. 16.65 Crore. Thus, the total depreciation allowed on generation assets is Rs. 29.90 Crore and is summarized below:

<i>Particular</i>	<i>Amount (Rs. Crore)</i>	<i>Depreciation Allowed (Rs. Crore)</i>
GFA FY04	876.43	16.65
New addition in FY05 and FY06	330.87	13.25
Total	1207.30	29.90

5.3.8 Reasonable return

The Board continues to be a vertically integrated entity and is yet to be unbundled as mandated under the EA, 2003. If the principles laid down in the sixth schedule of the ES Act, 1948 are to be followed; the rate of return to be allowed to the Board should be 3% on net fixed assets at the beginning of the year. This Act has since been repealed. However, as per the norms fixed in the CERC's Terms and Conditions of Tariff Regulations, a return of 14% on equity has been allowed to all Central sector generating stations and transmission utilities.

Section 61(a) of the EA, 2003 provides that the State Commission shall be guided by the principles and methodologies specified by the CERC. Further, under Section 61 (i) of the Act, the SERCs are to be guided by the National Electricity Policy and Tariff Policy. The draft Tariff Policy of Government of India provides that the rate of return notified by CERC for transmission would be adopted by SERCs for distribution.

It has been a criticism of the SERCs that they are somewhat niggardly in allowing an adequate surplus to power utilities. The feeling has been that the State Regulators did not allow sufficient return to the power utilities, which would provide them with an investible surplus required for expansion of their generating capacity and T&D network. The Commission is alive to this criticism. The Commission is also aware of the need for urgent addition to the generation capacity of the Board and the need for expansion of its T&D network for providing quality power in the State.

The equity base of the Board is very low at only Rs. 23 Crore. Therefore, even if the Commission allows 14% return on the equity, it will be of little consequence to the Board. In consideration of the provisions of the EA, 2003, CERC guidelines, draft Tariff Policy and to allow the Board adequate surplus for investment in new generation units and expansion of T & D network, the Commission considers it appropriate to allow 14% return on the net-worth of the Board at the beginning of the year. Net-worth has been considered for the purpose of the ROR because the retained earnings are supposed to have gone into creation of new fixed assets. The draft Tariff Policy also provides that for the purposes of return on equity, premium raised by a company while issuing share capital and investment or internal resources created out of free reserves of existing company, if any, for the funding of a project, should be reckoned as paid up capital for the purpose of computing return on equity, provided such premium and internal resources are actually utilized for meeting the capital expenditure of the project (para 5.3 of the draft Tariff Policy). The Commission also feels that this will give a right signal to private investment in the power sector of the State.

The Commission accordingly allows a return of Rs. 53.32 Crore on the net-worth of Rs. 380.84 Crore at the beginning of the FY06.

5.3.9 Approved ARR for Generation

In the light of the discussion above the ARR estimated by the Board for FY 06 and ARR approved by the Commission are as under:

<i>Generation</i>	<i>FY06 Projection</i>	<i>FY06 Approved</i>
<i>Expenditure:</i>		
<i>Generation Cost (Fuel Cost only)</i>	575.20	454.26
<i>R&M Expenses</i>	132.92	114.95
<i>Employee Expenses</i>	123.22	145.38
<i>A&G Expense</i>	7.41	7.41
<i>Depreciation</i>	54.33	29.90
<i>Interest and Finance Charges</i>	270.6	104.18
<i>Less: Interest and other expenses capitalized</i>	(121.95)	(56.24)
<i>Other Debits (Including Provisions for Bad debts)</i>	0.45	0.45
<i>Other (Misc.) – net prior period credit / Tax</i>	36.02	26.66
<i>Total</i>	1078.19	826.95
<i>Reasonable Return</i>	62	53.32
<i>Other Income</i>	33.35	25.77
<i>Annual Revenue Requirement</i>	1106.84	854.5

5.3.10 Generation tariff

Based on the above projected expenses and the net generation, the generation tariff projected by Board and as approved by the Commission is given below:

	<i>FY05 (Estimated)</i>	<i>FY06 (Projected)</i>	<i>FY06 (Approved)</i>
<i>Gross Generation (MU)</i>	7955	9256	9108
<i>Net Generation (MU)</i>	7210	8406	8273
<i>Auxiliary Consumption (%)</i>	9%	9%	9.16%
<i>Pooled Cost of Generation (Paise/unit)</i>	128	132	103.28

5.4 Transmission

The Board has presented the Annual Revenue Requirement for transmission as a separate function, as given in the following table:

Rs. Crore

Particulars	FY04 Actual s	FY05 Estimate s	FY06 Projected
SLDC Fees and Charges	-	-	-
R&M Expense	5.60	13.93	19.05
Employee Expenses	103.72	132.74	55.23
A&G Expense	17.19	18.22	19.32
Depreciation	16.19	17.50	23.93
Interest and Finance Charges	27.05	49.90	83.17
Less: Interest and other expenses capitalized	-5.06	-41.88	-38.78
Other Debits (incl. Prov for Bad debts)	-	-	0.00
Extraordinary Items	-	-	-
Other (Misc.)-net prior period credit,Tax	6.42	31.17	36.24
Total	171.12	221.59	198.15
Reasonable Return	-	53.65	62.38
Other Income	15.16	20.20	16.83
Annual Revenue Requirement	155.96	255.03	243.71

5.4.1 Operation and Maintenance Expenses:

The O&M expenses of FY05 and FY06 have been projected on the basis of past trends and modified to account for any substantive developments expected in the FY06.

The major heads of O&M expenditure are discussed below:

(a) Employees' Cost

The Employees' Cost consists of salary, wages, DA and other allowance and also discharge to Pension Trust, employer's contribution to gratuity fund. The Board has projected employee's costs of Rs.55.23 Crore in ensuing year which includes Rs. 5.72 Crore for gratuity fund @ 12.5% per annum on salary and DA. Board has assumed 15% increase in salary and DA.

As discussed in the para on employees' cost for generation in the subsequent submissions of the Board on the consolidated additional pension liability, the corresponding change in the transmission function is allowed by the Commission at Rs. 66.00 Crore for FY06. The Commission has allowed other employees' expenses as indicated by Board.

(b) Repair & Maintenance Expenses

The Board has projected R & M cost as 6% of the Gross Fixed Assets (GFA) of the previous year and accordingly, it is assumed to be the same for FY05 and FY06. This percentage is based on the actual repair and maintenance expense as a percentage of GFA of FY04. This ad hoc assumption is not acceptable. The R & M / O&M expenses should be as per the norms of the CERC. Even if it is to be considered based on actuals, then also only a reasonable annual escalation may be considered on the actual expenses of FY04 and also taking into consideration the actual expenditure for part of FY05. The R & M expenses for FY05 given by the Board are based on estimation for the entire year and not on the actual expenses for at least a part of the year. The Commission has considered the escalation of 10% on actuals of FY04 on year-to-year basis and accordingly the R & M expenses for FY06 are worked out at Rs. 6.77 Crore

(c) Administrative and General Expenses

The Board has projected 6% increase in FY06 over the previous year (FY05). The amount projected for FY06 is Rs.19.32 Crore. The Commission feels that it is reasonable and hence it is allowed.

In Rs. Crore

<i>Particulars</i>	<i>FY04 Actual</i>	<i>FY05 Estimated</i>	<i>FY06 Projection</i>	<i>FY06 Approved</i>
Discharge to Pension Trust	62.29	84.72		10.77
Contribution to Gratuity	2.29	4.97	5.72	5.72
Other Employee Cost	39.14	43.05	49.51	49.51
Total Employee Cost	103.72	132.74	55.23	66.00
Repairs and Maintenance Costs	5.60	13.93	19.05	6.77
Administrative and General Costs	17.19	18.22	19.32	19.32
Total O&M Costs	126.52	164.90	93.59	92.09
Expenses Capitalized	5.06		0.00	0.00

5.4.2 Interest and finance charges

The Board has estimated interest and finance charges at Rs.49.91 crore in FY05 and Rs.34.75 crore in FY06. The Commission had asked for the details of interest liability in FY05. It was found that Board has not raised any amount through market borrowings in FY05. It has reworked the interest on the borrowings raised during in FY05 and projected the borrowings for FY06 on that basis. Since Board did not borrow from market, hence the Commission does not allow any interest on working capital.

The other finance charges includes payment to the State Government as provided in the State Government Budget, which has been disaggregated into each functional statement. The ad-hoc payment to the State Government is not justified on any account and hence has been disallowed.

The Commission accordingly allows the interest and finance charges charged to revenue amounting to Rs. 16.80 Crore for FY06.

(Rs. in Crore)

	<i>As per Board FY05</i>	<i>As per Board FY06</i>	<i>Allowed by Commission for FY06</i>
Interest and Finance Charges on loans	31.19	32.84	32.84
Interest on Working Capital	0.08	.06	0
Other Finance Charges	18.64	1.85	1.85
Total	49.91	34.75	34.69
Interest Capitalised	41.88	17.89	17.89
Charged to Revenue	8.03	16.86	16.80

5.4.3 Depreciation

The CERC has allowed depreciation on the transmission lines above 66KV (i.e. 132 kV and above) at the rate of 2.5% on the straight-line method. The transmission lines of the Board are old and need to be augmented. The Commission, therefore, has taken a liberal view while allowing depreciation on transmission assets. Hence it allows depreciation at the rate of 4% on the new addition to fixed assets over the Gross fixed assets at the end of the FY04. The Commission has allowed actual depreciation as asked for by the Board on existing assets at the end of FY04. The total depreciation allowed on new assets is Rs. 16.16 Crore, whereas, the same on existing assets at the end of FY04 is Rs. 10.91 Crore. Thus, the total depreciation allowed on transmission assets is at Rs. 27.07 Crore as summarized below:

(Rs. in Crore)

<i>Particular</i>	<i>Amount</i>	<i>Depreciation Allowed</i>
<i>New addition</i>	273.21	16.16
<i>GFA at end of FY04</i>	232.16	10.91
<i>Total</i>	505.35	27.07

5.4.4 Reasonable Return

As already explained in relation to the generation above, the Commission is inclined to allow 14% return on the net-worth of the Board. Accordingly, a return of Rs. 53.64 Crore on the net-worth of Rs. 383.18 Crore at the beginning of the FY06 is allowed.

5.4.5 Approved ARR for Transmission

The ARR approved by the Commission in the light of the above discussions is Rs. 202.96 crore as against the Board's projected ARR of Rs. 243.71 crore. The difference is due to modification made by the Board and also due to the scrutiny carried out by the Commission.

Particulars	<i>FY06 Projected</i>	<i>FY06 Approved</i>
SLDC Fees and Charges	-	-
R&M Expense	19.05	6.77
Employee Expenses	55.23	66.00
A&G Expense	19.32	19.32
Depreciation	23.93	27.07
Interest and Finance Charges	83.17	34.69
Less: Interest and other expenses capitalized	38.78	17.89
Other Debits (incl. Prov for Bad debts)	0.00	0.00
Extraordinary Items	-	
Other (Misc.)-net prior period credit, Tax	36.24	26.82
Total	198.15	162.77
Reasonable Return	62.38	53.64
Other Income	16.83	13.45
Annual Revenue Requirement	243.71	202.96

5.4.6 Transmission Tariff

The transmission tariff proposed by the Board based on account of energy wheeled for the distribution function and as approved by the Commission is given in the table below:

Particulars	FY05 Estimated	FY 06 Projection	FY06 Revised Projection	FY06 Approved
Power Purchase or Energy Available (MU)	11,391	12531	14,158	14,158
Sale of Power (MU)	10,968	12066	13,633	13,633
Loss %	3.71%	3.71	3.71%	3.71%
Transmission Cost per unit (Paise/Unit)	23.00	20	15.12	14.33

The Board had initially indicated the inter-state sale of 128 MU, which it did not take in to account in the sale of energy. The Commission was of the view that inter-state sales should be taken in the account as sale of energy of the Distribution entity. Subsequently, the Board has revised the projected inter-state sale in FY06 to 648 MU. This is the power purchased from M/s Jindal on 220 kV, which is projected for sale to Gujarat Electricity Board (GEB). The Commission has agreed to the Board's pleading.

As regards transmission loss projected at 3.71% for FY06, prima facie it looks to be very low. However, the Board has submitted additional month wise information from June 2003 to November 2004 on energy input in the EHT system and energy output (export) from EHV system to the 33 KV system of the distribution entity, which shows the average transmission loss at 3.71%. Nevertheless, as already mentioned this transmission loss level looks to be low. However, in the absence of proper study, the Commission has provisionally accepted the above loss level for FY05, but expects that the Board shall maintain the same level in FY06. The Board is, however, directed to study and compute realistic transmission and distribution losses within the next six months.

5.4.7 Efficiency Parameter for Transmission

The CSEB has not given the efficiency parameter of transmission system, which is termed as percentage availability. It should work out the percentage availability of the transmission system by considering outages due to instantaneous trippings, break downs and also planned shut downs for annual maintenance. Normally the percentage availability should be around 98%, but being the first time, this efficiency parameter is introduced and as agreed during the discussions with the Board, the percentage availability for transmission system for FY06 is fixed at 97%.

5.5 Distribution:

The Annual Revenue Requirement of distribution function as projected by the Board is given below:

(Rs. Crore)

Particulars	FY04 Actual	FY05 Estimated	Projection FY 06	FY06 Revised Projection
Expenditure				
Purchase of Power from Board's own Generating stations	752.14	925.25	1106.84	863.84
Purchase of Power from other sources	615.07	825.95	949.3	1653.52
Intra State Transmission Charges	155.96	255.03	243.71	206.1
R & M Expense	19.34	39.24	62.39	23.28
Employee Expenses	414.9	339.48	220.93	268.91
A&G Expense	25.98	27.54	29.2	29.2
Depreciation	22.26	35.97	57.19	54.17
Interest and Finance Charges	107.13	190.91	242.76	86.01
Less: Interest and other expenses capitalized	(7.91)	(29.97)	(21.67)	(9.99)
Other Debits (incl. prov. for bad debts)	46.38	62.89	71.68	71.68
Extraordinary items	-	-		
Other (Misc.) – net prior period credit / Tax	10.89	25.39	55.76	36.7
Total	2,162.13	2,697.69	3018.08	3296.26
Reasonable Return	471.54	41.54	93.61	69.48
Other Income	175.32	190.34	211.12	164.99
Annual Revenue Requirement	2,458.35	2,548.89	2900.57	3200.75

5.5.1 Energy sales of the past two years

The energy sales and the percentage growth given by the Board for FY03 and FY04 are as per the following table:

Consumer Categories (In MU)	FY03 (MU)	FY04 (MU)	Growth (%)
Domestic	865	999	15%
Single Light Point	147	216	47%
Non-Domestic	186	212	14%
Public Water Works	41	44	8%
LT Industry	272	300	11%
Agriculture	729	643	-12%
Street Light	35	39	14%
Board Employees	15	17	8%
Temporary Connection	83	68	-18%
LT Total	2,373	2,540	7%
Railway Traction	487	529	5%
Coal Mines	386	405	5%
Cement Factory	633	627	-1%
Mini Steel Plant	258	437	69%
Electro Chemical / Electro thermal	22	30	3%
General purpose	249	286	15%
Two part tariff	327	396	21%
Slab tariff	117	148	26%
Ferro Alloys	141	381	169%
HT Public Water Works	21	24	14%
Tube Wells of Irrigation Deptt.	6	6	0%
Others at 132/220 KV	1,231	1,416	15%
HT TOTAL	3,878	4,685	21%
HT + LT TOTAL SALES	6,251	7,186	14%

In projecting the sales, the Board has not presented the data of the period prior to FY03 on the ground that the power scenario has changed considerably after creation of the new State. While this may be true, the growth rate based on the last 2 years cannot be fully relied upon for projection of future growth, particularly when the consumption taken for agriculture and single light point (un-metered categories) is not correctly assessed in the R-15 returns of the Board. The above figures give an

unrealistic load factor of 60-80% for SLP and 30-40% for agriculture consumers.

The Board has subsequently revised the energy sales for SLP, based on 15 units per month per consumer for which charges are paid by the Government and based on 8 to 10 % load factor also, which seem to be more realistic.

5.5.2 Energy Sales Forecast

The Board in its subsequent filing has presented the actual estimated sales of energy for FY05 and projected sale for FY06, which are given in the following table. This forecast which was prepared after discussions with the Commission has been approved.

Consumer Categories (In MU)	FY05 Estimated	FY06 Proposed by the Board and approved by the Commission	Growth over FY05 (%)
Domestic	1114.08	1,336.89	20%
Single Light Point	123.56	144.56	17%
Non-Domestic	238.73	269.76	13%
Public Water Works	47.37	52.10	10%
LT Industry	326.88	359.57	10%
Agriculture	202.84	243.41	20%
Street Light	44.12	50.70	15%
Board Employees	17.80	19.22	8%
Temporary Connection	65.77	65.77	0%
LT Total	2,181.15	2541.97	17%
Railway Traction	554.18	581.89	5%
Coal Mines	427.93	462.16	8%
Cement Factory	638.23	650.99	2%
Mini Steel Plant	504.28	854.31	69%
Electro Chemical / Electro thermal	30.91	40.34	30%
General purpose	319.52	357.87	12%
Two part tariff	423.72	639.33	51%
Slab tariff	158.25	333.28	111%
Ferro Alloys	407.63	436.16	7%
HT Public Water Works	27.00	31.05	15%
Tube Wells of Irrigation Deptt.	5.64	9.31	65%
Others at 132/220 KV	1,458.08	1501.82	3%
HT TOTAL	4,955.36	5,898.51	19%
HT + LT TOTAL SALES	7,136.51	8,440.48	18%

For arriving at the sales forecast for FY05, the Board has taken into consideration the current year's monthly data up to October 04 from the R-15 returns. For FY06, the growth rate of FY04 over FY03 has been considered for some categories. Normally, the Board should have considered the past history at least from FY02 and taking the Compound Annual Growth Rate (CAGR) for projecting the sales for FY06. In the case of some categories of HT consumers like MSP, Two Part Tariff, Slab Tariff and Electro-Chemical/ Electro-Thermal, a higher growth in consumption has been projected on account of a number of new connections pending, which will be released during FY06. For SLP and agriculture flat rate consumers, the revised consumption figures are as stated above.

The Commission's specific observations on the growth rate of the various consumer categories are as under:

Single Light Point (SLP): the Board has projected addition of 1 lakh new SLP connections during FY06 as per the State Government's directive. Based on this, the Board has assumed a growth rate of 17% over the estimated sale of 124 MU in FY05 and has projected a sale of 145 MU in FY06. Although this projection is very high, this is accepted by the Commission in view of the large scope of providing additional SLP/BPL connections.

On implementation of the directive that no new connection is to be given without meter in future, the concept of SLP connections without meters should not prevail during FY06. Un-metered connections would only be the existing un- metered SLP connections as at the end of FY05. The programme for metering of such un-metered connections has separately been given by the Commission.

Agriculture Metered and Flat Rate Consumers: The revised figures of sales to agriculture un-metered category (Flat rate) for FY05 and FY06 based on 8-10% load factor seems to be in order. However, for 25,000 new pumps expected to be given connection during FY06, as per the State Government's directive, the consumption (of 3-5 HP flat rate category) should also be assessed with 8-10% load factor. The projected consumption in agriculture sector in FY05 is estimated at 202.84 MU. Based on the above additions of pumps in FY06, the Board has assumed a growth rate of 20% in FY06 over FY05. Accordingly, sales in FY06 are projected at 243.41MU. Although these projections seem to be highly optimistic, but taking into account the State Government's declared policy to increase irrigation and in the interest of the agriculture development in the State, the above projections have been accepted by the Commission.

The Commission feels that for providing new agriculture pump connections the capital cost should be borne by the State Government and passed on to the Board as a grant, as the concessional tariff for

agriculture consumers shall be inadequate even to meet the liability of servicing the loans, if the Board does this work through borrowing. The present and the proposed tariff for agriculture is not sufficient even to meet the variable cost of supply, not considering the poor recovery from the sector.

Cement Factories: In the latest forecast of sale of energy, the Board has assumed a growth rate of 2% over the estimated sale of 638 MU during FY05 and projecting the sale of 651 MU during FY06, which has been accepted by the Commission.

Mini Steel Plant: The Board has stated the although the concessional tariff granted by the Board three years back has been discontinued, with a number of new connections with a contract demand of over 76 MVA sanctioned during FY04, which were expected to be operative after 1.04.2005, there will be a quantum rise in sales to this category during FY06. The sub-category wise growth originally assumed in the forecast by the Board is shown below:

<i>Sub Category</i>	<i>Past 2 yrs. Growth Rate %</i>	<i>Forecast</i>
<i>MSP Special Steel and Alloy units</i>	11%	68%
<i>MSP with Rolling Mill</i>	147%	34%

However, based on the assumption that all pending applicants shall be provided connections during FY06, the Board has amended the projected growth of MSP to be 68% over the estimated sale of 504 MU in FY05. Thus, the projected sale for FY06 is worked out as 854.31 MU. On the basis of the information on pending applications furnished by the Board, whose connections are expected to be served during FY06, the Commission has accepted the projections for FY06.

Two Part Tariff: The past growth rate at both 33 KV and 11 KV are stated to be at 17% (21% growth shown by the Board in FY04 over FY-03). However, as per the latest projections and on the ground that a number of applications pending are under this category also, which shall be connected during FY06, the Board has assumed a growth rate of 51% over the FY05. The sales have been projected at 639 MU in FY06. Although it seems to be very optimistic, but is being accepted by the Commission taking into account the details of pending applications furnished by the Board, whose connections are expected to be served during FY06, resulting in substantial additional sales in FY06.

Slab Tariff: In the original petition, the past growth rate and the projected growth rate separately for 33 KV and 11 KV sub categories are shown as below:

<i>Sub Category</i>	<i>Past two years Growth Rate %</i>
33 kV	18%
11 kV	25%

In the modified energy sale projections submitted by the Board and based on the same plea of releasing connections of pending applications during FY06, the Board has assumed a growth rate at 111% in FY06 over the estimated sale of 158.25 MU in FY05. Thus, the projected sale in FY06 is worked out as 333.28MU. On the ground as mentioned above, the Commission is accepting the Board's projected sales.

Ferro Alloys: The Board has given the following history of sales to Ferro Alloys industries since FY-02.

<i>Sales (In MU)</i>	<i>FY02</i>	<i>FY03</i>	<i>FY04</i>	<i>FY05</i>
Ferro Alloys at 33kV	Nil	141	381	408

The sales projected for FY06 is 436 MU as compared to 408 MU estimated for FY05, which shows a growth of 7%. The estimated growth in FY05 as compared to FY04 is also about 7%. But the earlier growth rate in FY04 compared to FY-03 was 169% ,said to be as a result of launching of a host of measures and allowing a concessional tariff to revive these industries, which were closed up to FY-02. The Board is apprehensive that there may be a decline in the sales in the FY06 because of the withdrawal of the concession scheme. A modest growth rate of 7% in the FY06 has therefore been assumed. The Commission approve the projected growth rate.

5.5.3 Energy Loss

The Board had initially assessed total T&D losses during FY05 at 37.24% (distribution loss is 35.25% and transmission loss 3.71%); but subsequently revised the data of energy sales and losses for FY05 and FY06. As per the revised data, the total T&D losses stood at 38.96% (Distribution loss at 36.94% and transmission loss at 3.71%) for FY05.

For FY06, only distribution loss is targetted to be reduced to 35.00%, thereby reducing the overall T&D loss to 35.81 % , as per following table:

	<i>FY05</i>	<i>FY06 Proposed</i>	<i>FY06 Approved</i>
<i>Energy Sales (MU)</i>	7,237	9,088	9,088
<i>Distribution Loss</i>	36.94%	35.00%	35.00%
<i>Transmission Loss</i>	3.71%	3.71%	3.71%
<i>T&D Loss</i>	38.96%	35.81%	35.81 %
<i>Energy Requirement (MU)</i>	11,857	14,158	14,158

The Board has not provided the break-up of T&D losses under technical losses and non-technical (commercial) losses. Under non-technical/commercial category of losses, further breakup is necessary for losses due to theft/pilferage and due to reasons other than theft /pilferage. This data was being regularly compiled in the un-divided MPEB. It is surprising that even after a lapse of five years of existence, the Board could not compile this very important information. The information on the T&D losses in different voltage levels, in proforma P-2 of the petition has not been furnished.

The energy sales in respect of un-metered SLP connections is assumed as 15 units per month per consumer and for flat rate (un-metered) agriculture consumption based on 8-10% load factor.

The Board should also provide meters to at-least 1% agriculture consumers, proportionately to total number of various types of un-metered agriculture consumers i.e. low, medium and high level consumption categories on open wells/tube wells and perennial sources like rivers/nallahs and test check load factor of one full year consumption covering all crops so that a realistic load factor is projected.

The Board should also ensure that in all industrial areas/ growth centers, electronic meters with MRI are installed on feeders at EHT sub-stations and monitoring is done on actual sales to all HT consumers fed from each feeder. If any abnormal differences are found then necessary action should be taken against the erring consumers. The Commission has already issued clear directives on this matter.

The Board is also directed to appoint a consultant to study the technical losses, non-technical (Commercial) losses with further breakup of losses due to theft/pilferage and due to commercial reasons other than theft/pilferage, within six months of the date of this order. This study should be accompanied by energy audit of the Board's system.

5.5.4 Collection efficiency

The collection efficiency against the current year's demand, as also against the arrears, at the beginning of year has neither been analyzed nor furnished by the Board. During discussions, an overall collection efficiency (of current dues plus arrears), has been indicated at 90%, which is very low. The collection efficiency against current year's demand has to be improved up to 98%, in phases apart from recovering at least 10 to 15% of the arrears at the beginning of the year. The Commission would like that during FY06 the Board ensures recovery of at least 92% (collection efficiency) against current demand and a minimum of 15% recovery out of the arrears as on 01.04.2005.

From the above target, the Board may, however, exclude only the disputed arrears and surcharge/ consequential surcharge thereon, for major consumers like Railways and BSP. The Board is, however, directed to resolve all such disputes within the next six months.

5.5.5 Cost of Supply

The Board has worked out the uniform cost of supply at Rs. 3.69 per unit for the FY05 for all HT and LT consumers together. As per provision of the Electricity Act, 2003, the tariff has to progressively reflect the cost of supply. This is not possible unless the Board compiles the data of cost of supply for each category of HT and LT consumers. To begin with, the cost of supply should at least be segregated for HT and LT consumers immediately. The Board should immediately appoint a consultant and work out category-wise cost of supply of all HT and LT consumer categories within six months of the date of this order.

It is observed that in the proposed tariff for FY06 for LT consumers, there are only two categories, namely non-domestic light and fan/power and LT industries, whose tariffs are higher than the average cost of supply, projected at Rs. 3.69 per unit. The LT tariff for non-domestic light and fan/power is the highest among all LT and HT consumers' categories. The tariffs for all other LT categories except Industry are much below the cost of supply, the lowest being for the agriculture consumers. During FY05, as per the existing scenario almost all categories of HT consumers have the tariffs either equal to or above the cost of supply, except public water works and tube wells of Irrigation Department.

5.5.6 Category wise cross-subsidy

It is observed that for FY06, based on the existing tariff and uniform cost of supply, LT non- domestic, LT industries and almost all HT consumers (other than public water works, tube wells of Irrigation Department) are cross-subsidizing the other categories of consumers. Although this picture may not be very correct due to non-availability of data regarding the cost of supply for each category of HT and LT consumers, it nevertheless emphasizes an immediate need for rationalization of tariffs.

5.5.7 External Subsidy

The State Government has been providing subsidy for the electricity consumed by all SLP and agriculturalists belonging to SC/ST for pumps upto 5 HP capacity. However, with coming into force of the Act, the subsidy on tariffs may be extended only as per the provisions of the Act. Section 65 of the Act provides that if the State Government grants subsidy to any consumer or class of consumers in the tariffs determined by the Commission, it shall pay in advance the amount to compensate the person (presently the CSEB) affected by the grant of such subsidy, in the manner the State Commission may direct.

The Commission has treated domestic consumers below poverty line (BPL) consuming upto 30 units per month as a separate category for the purpose of tariff, following the guidelines laid down in the National Electricity Policy. The tariff of this category has been kept at a concessional level with maximum possible cross subsidy. It is presumed that most of the consumers under the existing SLP category would now be covered under this new category. Similarly, for agricultural consumers, which have so far been highly cross subsidized, the metered and flat rate tariffs have still been retained, much below the cost of supply and with the maximum cross-subsidy.

The exact modalities of payment of subsidy will be decided by the Commission after the State Government decides about the quantum of subsidy and the category(ies) of consumers to whom subsidy is desired to be given. Till such decision is taken and the modality of payment is decided, the Board shall bill all consumers as per the tariff schedules given in this order.

5.5.8 Power Purchase Expenses

The Board proposes to meet the energy requirements from different sources as per the following table:

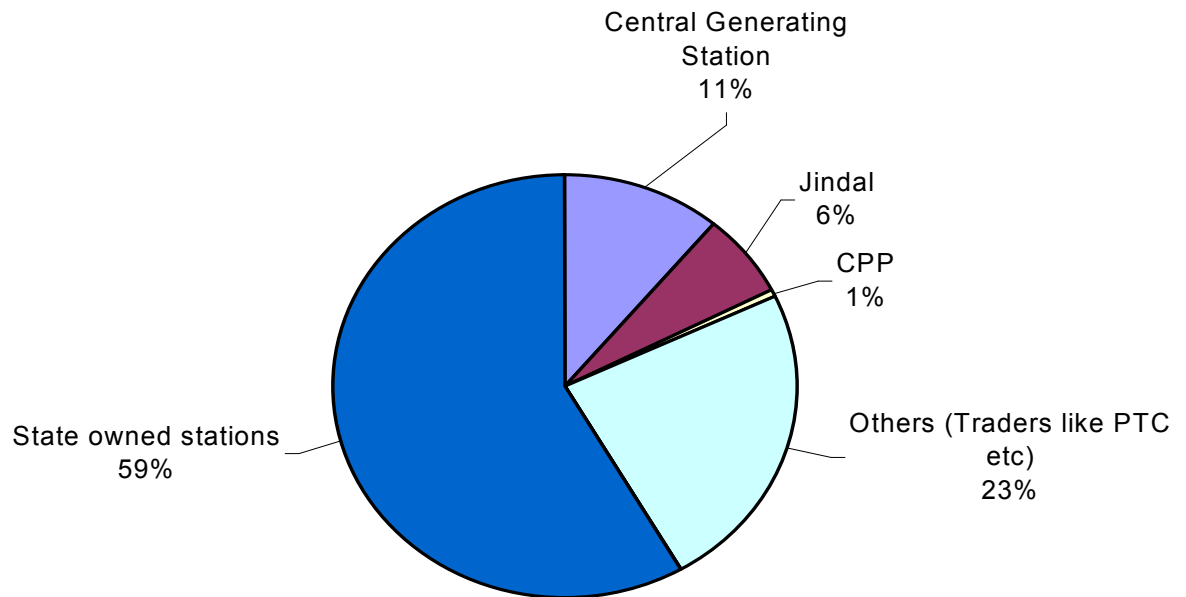
<i>FY06</i>	<i>Deemed Energy purchased (MU)</i>	<i>Actual Energy input (MU)</i>	<i>Rate-In Rs/unit</i>	<i>Amount Rs.(Cr.)</i>
<i>NTPC-Korba</i>	1471	1390	1.13	166.21
<i>NTPC-Vindhyachal I</i>	98	93	1.61	15.80
<i>NTPC-Vindhyachal II</i>	77	73	1.44	11.10
<i>NPC-KAPP</i>	-	-	-	-
<i>Jindal Steel and Power Ltd.</i>	910	910	2.32	211.12
<i>BALCO</i>	39	39	1.50	5.85
<i>Prakash Industries Ltd.</i>	4	4	1.00	0.4
<i>Jaiswal Nico</i>	55	55	1.62	8.91
<i>Chhattisgarh Electric Co. Ltd.</i>	1	1	1.00	0.1
<i>Others (PTC)</i>	3,514	3,320	3.30	1159.48
<i>Transmission Charges and UI</i>				44.01
<i>Total</i>	6169	5885	2.76	1622.98

In addition to the above, Board will be procuring power from its own generating stations to the tune of 8273 MU.

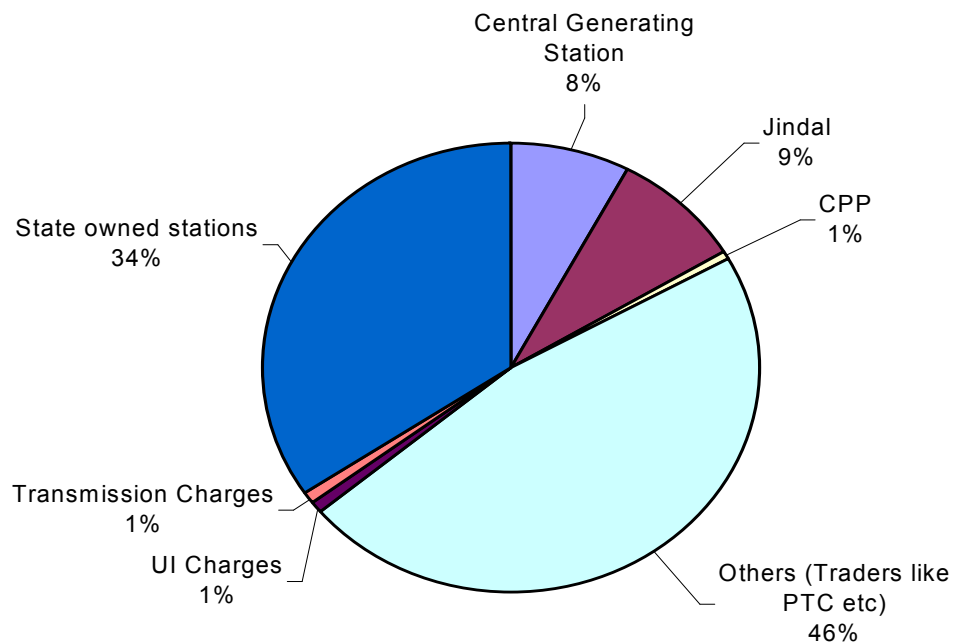
The Board had stated that since the process of tariff revision by the CERC for Central generating stations (CGS) is currently on, the rate of power purchase for various CGS has been assumed on the basis of average increase in the rates for last few years.

As per the principle adopted in respect of other items of generation, the rate of power purchase for FY06 should be assumed as per the tariff existing at the end of FY05. Any increase in the tariff of CGS after 1.4.05 has to be claimed through the VCA. The Board has agreed that any increase in the rates of power purchased from PTC or other sources shall be adjusted through the VCA. The Board has accordingly reworked the power purchase cost.

**Projected Percentage of Energy input from different sources to system
(14158 MU) during FY 06**



**Approved Percentage of Amount for Power Generation and Purchase
during FY 06**



5.5.9 Merit order dispatch

In order to ensure availability of power at reasonable rates, it is necessary to have a merit order of dispatch. Such a merit order ensures that cheaper power is purchased first to keep the cost of power to the minimum possible level. The details of power purchase by the Board from different sources as given in para 5.5.8 are listed in the table below in order of their cost to the Board:

<i>Source of power</i>	<i>Energy (MU)</i>	<i>Rate (Rs./unit)</i>
<i>NTPC Korba</i>	1471	1.13
<i>NTPC Vindhyachal-II</i>	77	1.44
<i>BALCO</i>	39	1.50
<i>NTPC Vindhyachal-I</i>	98	1.61
<i>Jaiswal Neco</i>	55	1.62
<i>JSPL</i>	910	2.32
<i>PTC and other traders</i>	3514	3.30

Purchase of power should be made by the Board in the above order.

UI Charges :

The Board also pays Unscheduled Interchange (U.I.) charges for overdrawal from the Central generating stations. These charges range from 6 ps/unit for overdrawals at frequency below 50.5 Hz to 570 ps/unit for frequency below 49.02 Hz. The Board is paying heavily towards UI charges which in FY05 has gone up to Rs. 90 crore.

However, in the present scenario of power shortage in the State, which is about 15-20% of the total demand, the Board has to buy power from all available sources, including the costly sources, such as PTC and other traders, at a higher rate in order to maintain adequate supply in the State. The purchase of power from PTC and others @ Rs. 3.30/ unit and also payment of high UI charges has pushed up the average cost of power and hence of supply. The Commission feels that the Board should seek and obtain cheaper sources of power from within the State. It should also explore the possibility of obtaining more power from captive power plants located in the State through open tenders. Other sources like un-allocated power of the Central sector should also be explored. Secondly, the Board should manage the demand during peak hours so as to reduce the high UI charges it is paying at present. More accurate demand forecasting, demand side management and energy audit will help the Board in tiding over the present power shortage to a large extent till new generation capacity is added, which is expected by FY07.

Thirdly, load shedding should be designed and managed in a better way. It is observed that inspite of the load shedding regime, which has been introduced after repeated directions of the Commission, it is inadequate to manage the demand and supply gap. The Board will be well advised to create a small cell, comprising both distribution and generation functionaries, to plan such management, implementation and monitoring of the load shedding after obtaining the approval of the Commission.

The Board is directed to restrict the peak demand by obtaining relief through load regulatory measures and avoid paying high UI charges for overdrawal, not below 49.5 Hz frequency. In case of any exigency, if overdrawal below 49.5 Hz is unavoidable then the Commission must be kept informed. The Board is also directed that any purchase of power should not be made at overall purchase rate of higher than Rs. 3.30 per unit.

5.5.10 Transmission Expenses

The Board has to pay transmission charges to the Power Grid Corporation of India (CTU) for energy from Central sector generating stations. The Board has sought Rs. 19.64 Crore for wheeling 1646 MU bought from the central generating stations in FY06. The Commission allows an amount of Rs.19.64 Crore towards transmission charges payable to Power Grid Corporation of India.

5.5.11 Operation and Maintenance (O&M) Expenses

The O&M expenses for distribution function have been projected for FY05 and FY06 by the Board on the basis of past trends as reflected in the trial balance of FY04 and the future expected out- flows are as per the following table:

	(Rs. in Crore)			
	<i>FY 04</i>	<i>FY05</i>	<i>FY06 Proposed</i>	<i>FY06 Approved</i>
Discharge to Pension Trust	249.16	147.37	47.98	38.07
Contribution to Gratuity	9.16	19.89	22.87	22.87
Other Employee Cost	156.67	172.23	198.06	198.06
Total Employee Cost	414.90	339.48	268.91	259.00
Repairs and Maintenance Costs	19.34	39.24	23.28	23.28
Administrative and General Costs	25.98	27.54	29.20	29.20
Total O&M Costs	460.22	406.27	321.39	313.85
Expenses Capitalized	7.91	0.00	0.00	0.00

The major heads of O&M expenditure are discussed below:

Cost of Employees

The Employees' Cost consists of salary, wages, DA and other allowance and also discharge to Pension Trust, employer's contribution to gratuity fund. The Board had initially projected employee cost at Rs.220.93 Crore in FY06, which includes 22.87 Crore for gratuity fund @ 12.5% per annum on salary and DA. The Board has assumed 15% increase in salary and DA.

As discussed in the para on employee cost for 'generation', in later submissions on the consolidated additional pension liability, the corresponding change in the distribution function is allowed by the Commission at Rs. 259.00 Crore for FY06 as against Rs. 268.91 Crore proposed by the Board. The Commission has allowed other expenses on employees as indicated by the Board.

Repair & Maintenance

The Repair & Maintenance cost has been proposed by the Board at 6% of the GFA as per actuals of the previous year (FY04). The same ratio has been taken for projecting the R&M expense for FY06. This is an ad-hoc basis and is not acceptable.

The historical data for actual R&M expenses for FY04 and actual for part of FY05 should be the basis for projecting the expenses for FY06, allowing a reasonable percentage of annual escalation, unless there are some specific reasons for making a higher provision. The Commission has, therefore, assumed 10% escalation over the actual R&M cost of FY04 on year to year basis and arrived at the cost of Rs. 23.28 Crore for FY06.

Administrative and General Expenses

The Board has projected in the ensuing year 6% increase over the previous year. The amount projected for FY06 is Rs.29.20 Crore. The Commission considers it reasonable and hence allows the proposed expenditure.

5.5.12 Interest and Finance Charges

The Board has estimated Rs.160.94 Crore in FY05 and proposed Rs.88.86 Crore in FY06. The Commission has sought and obtained the details of interest liability incurred in FY05. It is observed that Board has not raised any market borrowing in FY05. It has reworked the interest liability in FY05 and projected the same borrowing in FY06. The Commission has allowed the interest and finance charges amounting to Rs. 76.02 Crore in FY06.

	FY05	FY06 Proposed	FY06 Approved
Interest and Finance Charges	81.17	43.74	43.74
Interest on Working Capital	53.94	29.97	17.13
Interest on Security Deposit	18.24	20.65	20.65
Other Finance Charges	37.56	4.49	4.49
Total	190.91	98.85	86.01
Interest Capitalised	29.97	9.99	9.99
Charged to Revenue a/c	160.94	88.86	76.02

The other finance charges initially proposed by the Board included payment to State Government as provided in State Government Budget, which was disaggregated into each function. There is no justification for this payment to the Government. In its subsequent submissions, the Board has omitted the same.

5.5.13 Sundry Debtors/Receivables

The position of receivables and the provision for bad and doubtful debts as given by the Board is as follows:

Particulars	FY04 Actual	FY05 Estimated	FY06 Projection
Receivable from customers as at the beginning of the year	920.84	1,214.92	1,421.29
Revenue billed for the year	2,384.00	2,465.47	2,791.77
Collection for the year	(2,268.19)	(2,467.66)	(2,810.61)
Against current dues	NA	NA	NA
Against arrears upto previous year	NA	NA	NA
Gross receivable from customers as at the end of the year	1,036.65	1,212.73	1,402.46
Receivables against permanently disconnected consumers	178.27	208.56	241.18
Receivables	1,214.92	1,421.29	1,643.64
% of provision	31.24%	31.13%	31.28%
Provision for bad and doubtful debts	379.48	442.38	514.06

The position of arrears reflected in the table above should be a matter of grave concern. Arrears amounting to Rs. 920.84 Crore as on 31.03.2003 have gone up to Rs. 1214.92 Crore as on 31.03.2004, a rise of Rs. 294 Crore in one year. The arrears are shown to further mount up to Rs.1421.29 Crore by 31.03.2005 and further projected to mount up to

Rs. 1643.64 Crore by 31.03.2006, i.e., a rise of Rs. 723 Crore (nearly 80%) in three years. This is an alarming trend which must be arrested and reversed.

If serious steps are not taken to ensure recovery of an amount every year, which is more than the demand raised during the year and includes a portion of the arrears, then there would be no use of increasing tariff and the very objective of financial reform of the utility will come to nought. The Board has also failed to give the collection against current demand and against the arrears as at the beginning of the year separately on the ground that commercial formats do not contain this information. Such reviews are supposed to be done in the Board as per the prevailing practice, from the level of the distribution centre to the level of regions. Such a review is very necessary and has to be done. The Board has also failed to give break-up of arrears of connected consumers under various categories such as Government Departments / Undertakings, local bodies, etc. The Board has to pay serious attention to this and analyze and review the arrear position right from the level of distribution centers and ensure that there is nearly full recovery against the current year's demand as well as maximum possible recovery against the arrears.

5.5.14 Provision of Doubtful Debts

CSEB has proposed bad and doubtful debts at 2.5% of the revenues from sale of power in the financial year. The Commission feels that there is no justification for keeping the ad hoc provision for bad debts. During discussions with the Board officials it has been pointed out that if revenue demand raised against any consumer is reduced on account of any correction or compounding, then such reduction in demand can not be said to be a waiver of bad debt. Bad debt is only that demand which is correctly raised, but which can not be recovered due to various reasons like non-availability of whereabouts of the defaulter consumers or their properties, etc., making it difficult for the Board to effect recovery even through proceedings under Dues Recovery Act or through civil suits and on these justified reasons, the outstanding demand is written off. Accordingly the provision of bad and doubtful debts projected as Rs. 72.13 Crore (2.5%) in FY06, compared to estimated Rs. 63.25 Crore in FY05 and Rs. 46.45 Crore (actual) for FY04 does not appear to be justified.

The Board was asked to furnish the actual amount of receivables written off during FY04 and also at-least for part of FY05, based on which the Bad and Doubtful Debts should be projected for FY06. The Board has, however, failed to furnish the requisite details of actual receivables written off. The Commission has, however allowed the total bad debts during FY06 as Rs. 72 Crore (for all functions), with the condition that Board should strictly maintain the record of debt/ receivables written off and furnish this information to the Commission. The bad debt provision for FY07 shall be considered only on that basis.

5.5.15 Depreciation

As already mentioned before the Commission has taken a liberal view while allowing the depreciation on distribution assets, hence it has allowed the depreciation at the rate of 4% on the new addition during FY05 and FY06 in fixed assets over the gross fixed assets at the end of the FY04. Over and above this, the Commission has allowed actual depreciation as asked by the Board on existing assets at the end of FY04. The total depreciation allowed on new assets is Rs. 31.91 Crore, whereas, the same on existing assets at the end of FY04 is Rs. 22.26 Crore. Thus, the total depreciation allowed on distribution assets is at Rs. 54.17 Crore and is summarized as below:

<i>Particular</i>	<i>Amount (Rs. Crore)</i>	<i>Depreciation Allowed (RS.Cr)</i>
<i>New addition in FY05 and FY06</i>	797.84	31.91
<i>GFA at end of FY04</i>	653.83	22.26
<i>Total</i>	1,451.66	54.17

5.5.16 Reasonable Return

The draft national tariff policy provides for 14% return on equity to distribution companies in line with the CERC norms of 14% for transmission companies. For reasons already recorded in respect of reasonable return on generation assets, a return of Rs. 69.48 Crore on the net-worth of Rs. 496.28 Crore for distribution at the beginning of the FY06 is allowed by the Commission.

5.6 ARR for FY06 and revenue deficit

On the basis of the discussion in this chapter the Commission approves the ARR of CSEB, as an integrated power utility for FY06 as under:-

Particulars	<i>FY04 Actual</i>	<i>FY05 Estimated</i>	<i>FY06 Projection</i>	<i>FY06 Revised Projection</i>	<i>FY06 Approved</i>
Expenditure					
Generation(Fuel) Cost	394.07	427.6	575.2	454.26	454.26
Purchase of Power from other sources	615.07	825.95	949.3	1653.52	1622.98
R & M Expense	121.43	186.09	214.36	145	145
Employee Expenses	737.69	655.29	399.38	484.58	470.38
A&G Expense	40.73	52.75	55.93	55.92	55.92
Depreciation	55.1	92.91	135.45	111.14	111.14
Interest and Finance Charges	175.83	360.38	596.53	242.9	224.88
Less: Interest and other expenses capitalized	(12.97)	(107.87)	182.01	(84.12)	(84.12)
Other Debits (incl. prov. for bad debts)	46.45	63.25	72.13	72.13	72.13
Other (Misc.) – net prior period credit / Tax	26.34	87.54	128.02	93.19	88.62
Total	2199.75	2643.89	2943.88	3228.52	3160.79
Reasonable Return	471.54	148.50	217.99	176.44	176.44
Other Income	212.94	243.51	261.30	204.21	204.21
Annual Revenue Requirement	2458.35	2548.89	2900.57	3200.75	3133.02

In the modified ARR the CSEB projected a revenue deficit of Rs. 113.74 crore. However, on the basis of the ARR approved by the Commission, the revenue deficit is reduced from the projected Rs. 113.71 crore to Rs. 46.01 crore as under: -

Particulars	FY06 final proposal (Rs.Crore)	FY06 Approved (Rs.Crore)
Total expenses	3228.52	3160.79
Reasonable return	176.44	176.44
Other Income	204.21	204.21
Annual Revenue Requirement (1+2-3)	3200.75	3133.02
Revenue from Current Tariff	3087.01	3087.01
Surplus/ (Deficit)	(113.74)	(46.01)

To meet this deficit of Rs. 46.01 crore an overall increase in the present tariffs to the tune of about 1.47% is required. The tariff order in the following chapters has dealt with this.

5.7 Cost of Supply for FY06

The Cost of Supply on the basis of approved ARR for FY06 works out to Rs. 3.45 per unit. On the basis of this average CoS, the total amount of cross-subsidy works out at Rs. 311.33 crore (excluding sale to GEB) as per table below. This, however, is not the real cross-subsidy in the system as the CoS has not been worked out consumer category-wise.

CATEGORY WISE CROSS SUBSIDY CALCULATION

	Category	Sales in MU	Avg. Cost of Supply Rs/ Unit	Avg. Tariff Rs/ Unit	Cross Subsidy Rs/Unit
	L T SALES				
1	Domestic Light & Fan and Power	1504.84	3.45	1.97	-1.48
2	Non-Domestic L,F and P,X-ray	269.76	3.45	4.39	0.94
3	Public Utilities	98.63	3.45	1.88	-1.57
4	Agricultural consumers	243.41	3.45	1.66	-1.79
5	LT Industrial	359.57	3.45	4.20	0.75
6	Temporary Supply	65.77	3.45	1.24	-2.21
	H T SALES				
1	Railway Traction	581.99	3.45	4.16	0.71
2	Coal Mines	462.16	3.45	4.01	0.56
3	Cement Factories	650.99	3.45	3.96	0.51
4	Power Intensive Industries	1,290.47	3.45	3.37	-0.08
5	General Purpose -Residential		3.45		
6	General Purpose -Non Industrial	357.87	3.45	4.43	0.98
7	Public Water Works	31.05	3.45	2.28	-1.17
8	Tube Wells of Irrigation Dept.	9.31	3.45	2.29	-1.16
9	Heavy Industries at 132/220 KV	1,501.82	3.45	3.78	0.33
10	Other HT Industries	1,012.95	3.45	4.23	0.78

5.8 Revenue as per approved Tariff

The expected revenue and average tariff for the various categories of consumers at the approved rates of tariff will be as under:

Revenue from Approved Tariff by CSERC for 2005-06

Category	Sales in MU	Revenue from Tariff Rs.in Cr.	Avg.Tariff Rs/ Unit
L T SALES			
1 Domestic Light & Fan and Power	1504.84	296.61	1.97
2 Non-Domestic L,F and P,X-ray	269.76	118.55	4.39
3 Public Utilities	98.63	18.55	1.88
4 Agricultural consumers	243.41	40.49	1.66
5 LT Industrial	359.57	150.94	4.20
6 Temporary Supply	65.77	8.16	1.24
TOTAL (LT)	2,541.98	633.30	2.49
H T SALES			
1 Railway Traction	581.99	241.83	4.16
2 Coal Mines	462.16	185.33	4.01
3 Cement Factories	650.99	257.79	3.96
4 Power Intensive Industries	1,290.47	434.89	3.37
5 General Purpose -Residential	-	-	-
6 General Purpose -Non Industrial	357.87	158.43	4.43
7 Public Water Works	31.05	7.08	2.28
8 Tube Wells of Irrigation Dept.	9.31	2.13	2.29
9 Heavy Industries at 132/220 KV	1,501.82	567.27	3.78
10 Other HT Industries	1,012.95	428.17	4.23
TOTAL (HT)	5,898.61	2282.93	3.87
Inter State Sales	648.00	166.54	2.57
Total(HT+LT+Inter state Sale)	9088.61	3082.77	3.39
Miscellaneous Receipt		50.25	
Total	9,088.58	3,133.02	

Chapter 6 : Tariff Design

6.1 Introduction

There has been no revision of tariff by the CSEB, since its inception and the tariff as approved for the then M.P.E.B, in March 1999, is still in force. There has been a sea change since then, in terms of cost of generation, power purchase and the overall cost of service. Besides, the prevailing tariff is typically characterized by heavy cross- subsidization. The tariff, which is not based on commercial principles, has led to losses to the State utility while casting a heavier burden of cross subsidization on certain categories of consumers.

These distortions need to be corrected and rationalized. In this process of rationalization, the short-term objective is to balance the needs of various consumers, while full rationalization on the basis of commercial principles and based on the cost of supply can be achieved only in a gradual manner over a period of time. The immediate task before the Commission is to take definite steps in this direction. The tariff philosophy of the Commission (Chapter 3) deals with the principles which will guide the Commission in achieving the objectives of the Act and of the National Electricity Policy (NEP). The tariff design followed in this order is the first step towards achieving those objectives.

Under the provisions of Section 62(3) of the Act, the Commission may fix an appropriate tariff taking into consideration the consumer's load factor, power factor, voltage, total consumption of electricity during any specified period or the time at which the supply is required or the geographical position of any area, the nature of supply and the purpose for which supply is required. These principles have been kept in view in designing the tariff structure in this order. However, the fundamental principle of any tariff design is that it should be simple, practical and easy to implement. The first step, as already mentioned, has to be rationalization of the present tariff structure in which the number of HT and LT categories are quite large and without any sound basis and there are other distortions which need to be removed.

6.2 Rationalization of HT categories

There are presently 29 HT categories at different voltage levels. The number is large and should be reduced gradually. The merger of different categories could be done taking into consideration the nature of their use, while taking care to ensure that there is no tariff shock or advantage to the consumers in any existing category by merger into another category.

6.3 Rationalization of LT categories

Similar is the position of the 24 present LT categories in the current tariff. The categories here also can be rationalized and their number reduced by merging some of the existing categories of similar nature.

6.4 BPL Consumers:

One of the guidelines of National Electricity Policy (NEP) is that a minimum consumption of one unit / household / day for BPL consumers should be ensured at a concessional tariff. Presently there is a Single Light Point (SLP) category whose assessed consumption of 15 units per month is reimbursed to the Board by the State Government.

In view of the above guidelines in the NEP, a separate sub-category of BPL consumers is proposed to be created in the domestic category. A new slab of 30 units per month is proposed for such consumers and the present SLP consumers who are getting un-metered supply.

The Commission shall fix the tariff of this sub-category with a higher level of cross subsidy. With the creation of this sub-category, there is now no need for a separate SLP category. The State Government may provide subsidy in the tariff to BPL category to whatever extent it thinks appropriate.

6.5 Removing tariff distortions:

While there is a need for rationalization of tariff and removing distortions, the Commission has to ensure that the utility's financial viability is sustained through regulatory decisions. In the absence of data of cost of supply and its breakup into fixed and variable components, the Commission for the time being, has adopted the concept of fixed cost alongwith the energy charges in determination of tariff. The Commission shall bring up the fixed part of the tariff to the level of actual fixed cost component of the cost of supply in future.

6.6 Modification in the existing tariff structure:

The Commission has discontinued the concept of telescopic tariff for of non-domestic category and has designed the tariff on non-telescopic basis. The tariffs for lower consumption slabs are fixed keeping in view the fact that the paying capacity of consumers in the lower slabs of consumption is limited. The tariffs in lower consumption slabs are thus kept lower than those for the higher consumption slabs. The consumers with higher consumption should pay at a higher rate for all the energy consumed. The principle is that a consumer should pay a tariff as per its consumption level.

Since the Act mandates that consumers of all categories have to be metered, ideally no new connection should be served without a meter and the tariff applicable to them should be metered tariff, and efforts should be that all present un-metered (flat rate tariff) consumers are provided with meters within a fixed timeframe. The flat rate tariff should be such that there is a built-in incentive for taking metered connections.

6.7 Time of Day (ToD) Tariff:

There is high dependence of the CSEB on purchase of power. The power purchased from all sources constitutes 43% of the total power. Purchase is made at different rates for different times of the day. The Commission feels that ToD tariff is necessary at least for industrial consumers to offset the power purchased during peak load hours, when the Board is required to pay very high cost. The other objective of ToD mechanism is to shift the load from peak hours by providing some concessional tariff, so that the load curve is flattened and the burden of purchasing power at very high cost during peak hours is reduced.

6.8 Encouragement of H.T. and bulk supply:

Some of the residential townships of Central Government undertakings, major industries, etc. avail H.T. supply at a single point. The residents of these colonies generally pay the electricity charges under H.T. 'General Purpose' tariff and in some cases on the tariff applicable to the concerned industries. Both are much higher than L.T. domestic tariff. There have been repeated representations to the Commission to remove this disparity. The Commission proposes to remove this disparity in the tariff for consumers for whom power is procured in bulk, but who have similar characteristics as domestic consumers. A separate consumer category for residential townships/colonies (mixed load) taking H.T. connection at a single point is being created.

Under this category, the concerned organization or the user group or the representative of consumers shall avail bulk supply connection at H.T. and like other H.T. consumers, shall be responsible for installation and maintenance of transformer/switchgears, L.T. distribution, etc. beyond H.T. metering point. This will be beneficial to both, the utility and the consumers.

6.9 Minimum Charges - Review of the concept:

Presently most of the consumer categories have an element of 'minimum charges' along with the element of demand (fixed) charges. In some of the HT categories, the minimum charges are there along with demand (fixed) charges. The purpose of 'minimum charges' is to recover at least some part of the fixed cost, which is served by levying demand (fixed) charge. The Commission feels that the minimum charges can be done away with except where necessary and demand (fixed) charges can be increased gradually to meet the fixed cost of supply. This has been attempted in the tariffs approved.

6.10 Application of tariff philosophy:

- The tariffs of the consumers below cost of supply have been increased to a higher extent as compared to those whose tariffs are above the cost of supply, thereby reducing the cross subsidy.
- The Commission has re-categorized the slabs in the domestic category and has introduced a 'Below Poverty Line (BPL)' sub-

category for 0-30 unit slab with concessional tariffs, with a large element of cross-subsidy.

- Fixed charges have now been introduced for LT consumers including domestic category. The fixed charges have been increased for HT consumer categories so that gradually the fixed component of the cost of supply is recovered through such charges. Simultaneously, the energy charges have been reduced. Since for the domestic categories the fixed charges are on per unit basis, a minimum of fixed charges have also been levied on domestic connections, both single and three phase separately, but not for 0-30 unit slab BPL consumers.
- Due to introduction of fixed charges, the concept of monthly minimum charges has been done away with in few cases.
- For LT agriculture category the tariff of un-metered consumers has been kept at a slightly higher level compared to metered category, in order to provide an incentive for metered connections.
- In order to provide an incentive to subsidizing HT consumers for higher consumption, there is a relative decline in their average tariff on higher load factor and an incentive, based on load factor, is being extended to some of the categories.

6.11 Tariff categories

After careful consideration, the Commission has approved the following categories:

A. LT Categories [upto maximum connected load of 100 HP/75kW except 4(9)]

1. Domestic light, fan & power
 - (a) BPL consumers – 0-30 units slab
 - Un-metered
 - Metered
 - Non-BPL un-metered 0 to 30 units
 - (b) 0-100 units slab
 - (c) 101-200 units slab
 - (c) Above 200 units slab
2. Non-domestic light, fan and power and X-ray (Non-telescopic)
 - (a) 0-1000 units
 - (b) Above 1000 units
3. Agricultural consumers
 - (a) Metered (for all consumers above 5 HP and those of below 5 HP who opt for metered tariff)
 - (b) Flat rate (for all consumers upto 5 HP who opt for flat rate)
4. Industrial consumers

- (a) Flour mills/Huller (Up to 15HP)
 - (b) Power looms (Up to 25HP)
 - (c) LT industries (Up to 25HP)
 - (d) LT industries (Above 25HP to 75HP)
 - (e) LT industries (Above 75HP to 100HP)
 - (f) LT Industries (Above 100HP to 150HP) – Only for existing consumers.
 - (g) Demand based tariff for LT industries with minimum 15 KW contract demand and up to 75 KW (Up to maximum connected load of 150 HP)
- 5. Public utilities
Street lights and water works – (a) Rural
(b) Urban
 - 6. Temporary supply

B - H.T. Categories

- 1. Railway traction (at 220/132 KV)
- 2. Coal mines (at 132 KV and at 33 KV)
- 3. Cement factories (at 220/132 KV and at 33 KV)
- 4. Heavy Industries (at 220/132KV) with CD above 20 MVA.
- 5. Power intensive industries upto 20 MVA (at 220/132 KV and at 33 KV): covering earlier categories of:
 - Mini Steel Plants (MSP)
 - MSP with Rolling Mills/ Sponge Iron Plants in one premises
 - Ferro Alloy
 - Rolling Mills (earlier covered under other categories)
- 6. Other H.T. industries (at 33KV and 11KV). All industries earlier covered under two-part and slab tariff categories and electro-chemical/electro- thermal industries.
- 7. General Purpose: Residential colonies/townships (at 220/132KV, 33KV and 11KV)
- 8. General Purpose: Non-industrial (at 220/132KV, 33KV and 11KV)
- 9. Public water works (at 33KV and at 11KV)
- 10. H.T. Irrigation (at 33KV and at 11KV)
- 11. Temporary connection
- 12. TOD Tariff

Explanation of approved categories and approved tariffs:

6.12 LT Categories:

6.12.1 Domestic Light, Fan and Power:

- a. The domestic category has now been classified into two sub groups on the basis of their level of consumption. Consumers classified as BPL by the State Government have been categorized into a separate group. The tariff proposed for them has been kept very low in line with the guidelines in National Electricity Policy. For such BPL consumers a flat rate per connection has been fixed for maximum consumption of 30 units per month based on 120 W connected load

at about 35% load factor. All un-metered consumers whose consumption does not exceed this level will also pay the same flat rate tariff as per BPL category, till they are metered where upon metered tariff will be applicable to them. If the connected load of any such connection is found to be more than 120W, then monthly billing will be done for assessed units based on actual load found and 35% L.F., at appropriate slabs of domestic metered tariff. Such consumers shall cease to be covered under BPL category thereafter.

- b. Higher slabs have higher energy charge as consumers using larger number of units are presumed to have better paying capacity.
- c. The fixed charge component has been introduced but with a minimum fixed charge limit for single phase and three phase consumers. No minimum fixed charge is kept for BPL consumers. The Board in its petition has indicated that fixed charges are about 53% of the cost of supply. In this category, the tariff has been divided in fixed as well as variable charge. Fixed charge is based on the consumption of the consumer.
- d. To keep the billing structure simple, the Commission has retained the telescopic tariff structure.
- e. This is a cross-subsidized category and their present rates are much below the cost of supply. Marginal increase in tariff for such categories of consumers has been proposed.

6.12.2 Non-domestic consumers and X-ray plants

- a. The prevailing separate tariff for X-ray plants has been merged with non-domestic category and its slab structures have been made non-telescopic.
- b. Due to the introduction of the fixed charge concept for different slabs, no monthly minimum charges are now prescribed. Fixed charges are separate for single phase and three phase connections. Fixed charges for single phase connections have been specified on the basis of consumption pattern.
- c. Non-domestic category which has one of the highest tariffs, has been provided some relief and the tariffs for this category have been structured in such a way that for different ranges of monthly consumption, there will generally be a relief in the overall monthly bill.

6.12.3 Agricultural consumers

- a. Agriculture tariff has traditionally been highly subsidized. The tariff philosophy provides that the agricultural tariff is to be increased in such a way that it reaches 75% of cost of supply in the next five years. Keeping this requirement in view but also the importance of the agriculture sector, the overall tariff for metered category has been raised marginally by introducing the concept of monthly fixed charge per HP. The flat tariff for un-metered agricultural connections has

been adjusted by suitable increase, so that metered tariff remains attractive.

- b. The un-metered flat rate tariff for agricultural consumers shall be applicable to all existing un-metered connections and those new connections upto 5 HP who opt for flat tariff.
- c. Only metered tariff will apply to all connections above 5 HP. Those connections of above 5 HP which are presently un-metered will have a slab rate, which is higher than that for connections below 5 HP, till these are provided with meters.
- d. The condition of minimum charge of 360 units per HP per annum has been done away with.
- e. New connections of above 5 HP shall be served only after installation of capacitor of specified rating with the view to improve system conditions and voltage profile in rural areas. Existing connections of above 5 HP are required to provide capacitors of specified rating by 31/12/05 failing which they shall be required to pay surcharge of 30 paise per unit. For such flat rate consumers, the surcharge shall be levied on assessed units.

6.12.4 LT industrial consumers

- a. All LT connections including industrial connections shall be provided to a maximum connected load of 100 HP only and for any load above this, the consumer has to avail an HT connection. The existing LT consumers under 100-150 HP slab shall continue to be covered under this tariff category, but they have to convert to HT supply by December, 2005 failing which they have to pay 7% surcharge on energy and fixed charges after December, 2005
- b. In pursuance of the policy of rationalization of categories, the general LT industrial category and seasonal category have been merged, but it has been ensured that there is no undue tariff shock to seasonal consumers, which are not many.
- c. With the introduction of monthly fixed charge, monthly minimum energy charge of 45 unit/HP/month is now proposed to be reduced to 25 unit/HP/month. It will be beneficial to the consumers who are not able to run their industry fully due to various reasons.
- d. The LT demand based tariff for industries has been kept for a contract demand of a minimum of 15 KW and a maximum of 75 KW. The monthly minimum charge shall be the demand charge on CD. A maximum total connected load of 150 HP shall be permitted in this category.

6.12.5 Public Utilities (Water Works & Street Lights)

- a. Since both street lights and water works are public utilities, the two have been merged under a single tariff, but differentiated on rural and urban area basis.

- b. Fixed charges have been kept the same for rural and urban public utilities, but the energy charges (Rs. per KWH) are kept lower for rural connections. The fixed charges have been kept in terms of Rs. per KW or per HP of connected load per month.
- c. This category has so far been heavily cross-subsidized, and bringing them closer to the cost of supply would involve a hefty rise in their tariff. In consideration of their being public utilities, the overall tariff has been raised only marginally.
- d. With introduction of the fixed charge concept, the condition of monthly minimum charge has been done away with.

6.12.6 Temporary supply

To make it more affordable, the tariffs for temporary supply has been reduced from the present two times to 1.5 times of the normal tariff (on fixed charge as well as energy charge and VCA charge) for respective LT categories for which temporary connections are availed.

6.13 HT categories

6.13.1 Railway traction

- a. Railway traction being one of the highly subsidizing and the largest consumer, efforts have been made to restructure its tariff in such a way that on a normal working load factor, there is a reduction in the average tariff.
- b. The condition of minimum 30% load factor on contract demand for calculating monthly minimum charges has been relaxed to 25% on an average power factor of 0.9.
- c. KVAh billing is being introduced for the first time only for this category, which will automatically take care of the power factor incentive/disincentive.

6.13.2 Coal Mines

The tariff for coal mines, which is also a highly subsidizing category, has been rationalized in such a way that on a normal working load factor, there shall be a marginal reduction in the overall tariff impact for 132 KV coal mines connections and only a small increase for coal mines at 33 KV.

6.13.3 Cement Factories

The prevailing tariff for cement factories is also in the subsidizing category. Their tariff has also been rationalized in such a way that there is a decrease in the overall tariff impact for connections at 132/220 KV on the basis of previous year's load factor, except for a marginal rise in the overall tariff at 33 KV. Provision for load factor incentive has also been made.

6.13.4 Heavy Industries (132/220 KV)

Major industries like BSP, BALCO, etc. at 132/220 kV are covered under this category. The tariffs for this category has been rationalized in such a way that the overall tariff remains more or less the same. But consumers having their own residential townships and colonies can get the benefit by availing separate connection for their township and avail the newly introduced category of "General Purpose (for residential townships/ colonies)". (Tariff HV-7)

6.13.5 Power Intensive Industries

The existing categories as mentioned in para 6.11(B-5) above have been merged and would be covered under this new category.

In restructuring the tariffs of the above categories, there is some reduction in tariff for the Ferro Alloy units as these are highly power-intensive, whereas, for Rolling mills there is only a marginal rise in the tariff, which however, is sought to be compensated to an extent by higher load factor incentive.

6.13.6 Other HT Industries (33 and 11 kV)

Other industries earlier covered under slab tariff and two-part tariff and electro-chemical and electro-thermal units shall now be covered under this category. There is a marginal increase in the tariff of the above categories where as there has been slight reduction in the tariff for electro-chemical and electro-thermal units.

6.13.7 General purpose - Residential (132/220 kV, 33kV and 11kV)

Keeping in view the long-standing demand of BSP, other CPUs and the public, the Commission has created a separate category for residential townships and colonies (with predominantly domestic connections), whose tariff has been kept in between prevailing HT tariff and LT tariff.

6.13.8 General purpose - Others (Non-industrial)

The consumers with mixed load, earlier covered under the HT General Purpose tariff for all voltages, have been retained in this category. There is only a marginal rise in the tariff in this category.

6.13.9 Public Water Works

This consumer category, whose existing tariff is much below the average cost of supply, has been retained as such in view of this being a public utility. Its tariff will continue to be subsidized. The tariff of this category has been raised only marginally.

6.13.10 HT Irrigation

This category has been retained as such and its tariff will continue to be below the average cost of supply. Tariff of this category has been raised only marginally

6.13.11 Temporary Connections

The tariff for temporary supply has been reduced from two times to 1.5 times of the normal tariff (on fixed charge as well as energy charge and VCA charge) for respective HT categories, for which temporary connections are availed.

6.13.12 TOD Tariff

Since the new State came into being, there has been a large increase in demand for power in Chhattisgarh while there has been no addition to generation capacity. As a result, at present there is a large gap between the availability of power as compared to the demand, not only during peak hours but to some extent even during off-peak hours. There is a pressing need to restrict the use of power during peak hours by levying extra charge on the normal tariff. Although the position during off-peak hours is also not very satisfactory, but in order to flatten the load curve by shifting some load from peak hours to off-peak hours, the use of power during off-peak hours has been incentivised to an extent.

TOD tariff is also being allowed to industries having standby power plants so that by the use of their own generating plants during peak hours and shifting the load to off-peak hours, the demand during peak hours may be restricted, when the Board is required to purchase power at a very high cost. They will also be benefited by using Board's supply during off-peak hours

6.14 Billing in KVAh

The Board had proposed determination of tariff on KVAh basis in place of the present KWh on the ground that it will automatically take care of the power factor incentive/disincentive. However, most of the industries associations objected to this on the ground that KVA is an apparent power which is calculated by the vector sum of active (KWh) and reactive (KVARh) power and there are no calibrated meters which can measure KVAh consumption. Although the Commission does not agree to their plea, on consideration of the fact that almost all over the country KWh system is being followed since a long time and KVAh system has been introduced only in very few States, the Commission has decided not to change over to KVAh for the time being. It is being introduced only for railway traction on experimental basis and with Railways' consent.

6.15 Miscellaneous and general charges

The Board also submitted proposal for determination of Miscellaneous and General Charges. It has been stated by the Board that most of the charges are service charges and have a major labour component, which has gone up by about 20%. The material cost has also gone up. These charges were last revised in June, 2000 by the erstwhile MPEB. Where the Board could not find any references, the charges approved by MPERC in its order dated 09/12/2004 have been referred to.

While going through the information submitted by CSEB, it was found that no systematic approach has been made by the Board in suggesting increase in these charges. There were no suggestions on this issue during the public hearings either.

There has been no serious effort by the Commission for determination of these charges on any rational basis in the absence of any rational explanation or justification for the present rates. Therefore, the charges have at present been fixed looking to the normal price increase and the charges prevailing in Madhya Pradesh. Detailed exercise is required to be carried out by the CSEB on each charge before filing of the next tariff petition.

6.16 Schedules of Tariff and Miscellaneous Charges

The different tariff schedules as approved by the Commission for FY 06 and other terms and conditions thereof are appended. The schedule of miscellaneous charges as approved by the Commission is also appended.

TARIFF SCHEDULE FOR LOW TENSION CONSUMERS

LV-1: DOMESTIC

1. Applicability

This tariff is applicable to domestic light and fan; power for heaters, air conditioners, washing machines, cookers, refrigerators, ovens, mixers and other domestic appliances; Dharamshalas; student hostels; Ashrams; hospitals run by charitable trusts; Government hospitals/ dispensaries, (excluding private clinics and nursing homes); farm houses; mosques; temples; churches; religious and spiritual institutions; water works and street lights in private colonies and cooperative societies; post office at residence of a villager; residential premises of advocates, doctors, artists, weavers, bidi makers, stitching and embroidery workers; fractional HP motors used for Shailchak by Kumhars in their residence, lawyers' chambers even outside their residences.

2. Character of Services

Alternate current (A.C.) 50 hertz, 230 Volts, Single-phase upto a load of 2 KW.

(a) A.C, 50 hertz, three phase, 400 volts or above for load above 2 KW upto 75 KW.

3. Tariff

	Category of consumers	Unit Slab (Telescopic)	Fixed Charge (In Rupees)	Energy Charge (Rs. per unit)	Minimum Fixed Charge
1.1	LV-1: Domestic BPL consumers				
1.1.1	Un-metered supply	-	50/- per month per connection	-	
1.1.2	Metered supply	0-30 units	0.75 per unit	0.75	
1.2	Other consumers metered supply	0 - 100 units 101 - 200 units Above 200 units	0.75 per unit 0.75 per unit 0.75 per unit	0.80 1.40 2.05	(i) Single phase - Rs.30/- p.m. (ii) Three phase - Rs.100/- p.m.

Note: (i) The existing un-metered SLP consumers shall be billed according to BPL tariff 1.1.1 till they are metered. In case the connected load at any time is found more than 120 Watts, then the consumer will cease to be covered under LT tariff 1.1.1 and thereafter monthly billing shall be done according to LT tariff 1.2 for his consumption assessed on 35% load factor.

(ii) If the consumption of a metered BPL consumer exceeds 30 units per month or the connected load at any time is found more than 120 Watts, then the consumer will cease to be covered under LT

Tariff 1.1 applicable to BPL category and thereafter, monthly billing shall be done according to Tariff 1.2 for his consumption assessed on 35% load factor (for un-metered BPL consumers).

LV-2 NON-DOMESTIC

1. Applicability

This tariff is applicable to light and fan and power to shops, show rooms, business houses, offices, educational institutions (except ITIs, workshops and laboratories of Engineering Colleges/Polytechnics), public buildings, town halls, clubs, meeting halls, places of public entertainment, circus, hotels, cinemas, railway stations, private clinics and nursing homes, X-rays plants, diagnostic centres, pathological labs, fisheries, aqua-culture, seri-culture, dairy, hatcheries, printing presses, milk chilling centres, poultry farms, cattle breeding farms, nurseries, plantations, mushroom growing, carpenters and furniture makers, juice centres, hoardings and advertisement services, public libraries and reading rooms, typing institutes, internet cafes, STD/ISD PCO's, FAX/ photocopy shops, tailoring shops, photographers and colour labs, laundries, cycle shops, compressors for filling air, single phase toy making industry, nickel plating on small scale, restaurants, eating establishments, guest houses, marriage gardens, welding transformer and lathe machines for repair works and services, book binders, petrol pumps and service stations, lifts and other appliances in shopping centers and offices.

2. Character of Services

(a) AC, 50 hertz, 230 Volts, Single-phase upto a load of 2 KW.

(b) AC, 50 hertz, three phase, 400 volts or above depending upon the availability of voltage of supply for load above 2 KW upto 75 KW.

3. Tariff

	Category of consumers	Fixed Charge in Rs.	Unit slab (Non-telescopic)	Energy charge (Rs. per unit)
2.1	LV-2: Non-domestic		0-1000 units	3.80
2.1.1	Single phase connection			
2.1.1	(i) Up to 100 units	Rs. 20/- P.M.	0-Above 1000 units	4.30
2.1.2	(ii) Above 100 units	Rs. 50/- P.M.		
2.2	Three phase connection	Rs. 60 / KW / month		

Note: All existing L.T. non-domestic connections above 100 H.P. and up to 150 H.P. shall avail H.T. supply by 31/12/2005 failing which 7% additional charge on total amount of monthly bill (fixed and energy charge and also VCA charge, if any) shall be levied.

LV-3 L.T. AGRICULTURE

1. Applicability

This tariff is applicable to agricultural pump connections, chaff cutters, winnowing machines, sugarcane crushers used on agricultural land, lift irrigation pumps of State Government or its agencies; water drawn by agriculture pumps used by labour, cattle, birds including poultry and farm houses **in the same premises of agriculture farms** for drinking purposes only.

2. Character of Services

AC, 50 hertz, single phase/three phase, 230/400 volt depending upon availability of voltage of supply, upto 75 KW/100 HP load.

3. Tariff

	Category of consumers	Fixed Charge	Energy Charge (Rs. per unit)
	<u>LV-3: L.T. Agriculture</u>		
3.1	Metered Supply	Rs. 20 per HP per month	1.00
3.2	Flat Rate Supply		
3.2.1	Upto 5 HP	Rs. 65 per HP per month	-
3.2.2	Above 5 HP	Rs. 75 per HP per month	-

4. Pilot lamp

One 40W bulb is permitted at or near the motor pump set in the power circuit.

5. Notes

- (i) All new agriculture connections shall be served only with meters and connections above 5 HP load shall be billed on the basis of actual consumption recorded in the meter as per L.T. tariff 3.1.
- (ii) All existing connections above 5 HP load shall be provided with meters as early as possible and till then those shall be billed at the rate of Rs.75 per HP per month
- (iii) Connections up to 5 HP load shall have the option of being billed on actual consumption in meter or on flat rate.
- (iv) New connections of above 5 HP shall be served only after installation of capacitor of specified rating.
- (v) Existing connections of above 5 HP shall be required to provide capacitors of specified rating by 31/12/05 failing which they shall be required to pay surcharge of 30 paise per unit. For flat rate consumers, the surcharge shall be levied on assessed units.

LV-4 L.T. INDUSTRY

1. Applicability

These tariffs are applicable to light and fan and power for flour mills, hullers, power looms, rice mills, dal mills, oil mills, ice factories, cold storage plants, grinders for grinding masala, ice candies, ITIs, workshop & laboratories of engineering colleges & polytechnics and other industrial installations and workshops where manufacturing takes place i.e. conversion from raw material to finished good and which are registered with Industries Department as industrial units and also covered under Factories Act, 1948.

2. Character of Services

AC, 50 hertz, single phase/three phase, 220/400 volt or above depending upon availability of voltage of supply, upto 75 KW/100 B.H.P.

3. Tariff

	Category of consumers	Fixed charge / Demand charge on CD/ CL	Energy Charge (Rs. per unit)	Minimum charge
	LV-4: L.T. Industry			
4.1	Flour mills, Hullers up to 15 HP	Rs.20 / HP / Month	2.00	The minimum charge shall be the fixed charge on CL + the energy charge for 25 units per month per HP of the CL
4.2	Power looms up to 25 HP	Rs.20/ HP/Month	1.45	
4.3	Other Industries			
4.3.1	Up to 25 HP	Rs.40/ HP/Month	2.30	
4.3.2	Above 25 HP up to 75 HP	Rs.60/ HP/Month	3.30	
4.3.3	Above 75 HP up to 100 HP	Rs.80/HP/Month	3.40	Demand charge on contract demand
4.3.4	Above 100 HP up to 150 HP	Rs.160/HP/Month	3.60	
4.4	Demand based Tariff for demand between 15 and 75 KW	Rs.125/KW/Month	3.40	

Notes: (i) Tariff 4.3.4 is only for existing consumers having connected load above 100 HP and up to 150 HP.

All such L.T. industrial connections shall avail H.T. supply by 31.12.2005 failing which 7% additional charge on total amount of monthly bill (fixed and energy charge and also VCA charge, if any) shall be levied.

(ii) Demand based tariff – 4.4 is for the maximum demand between 15 KW and 75 KW.

Total connected load in this tariff shall not be more than 150 HP.

LV-5 PUBLIC UTILITIES

1. Applicability

These tariffs are applicable for public utility water supply schemes, sewage treatment plants and sewage pumping installations, crematorium, traffic signals and lighting of public streets including public parks and monuments when requisition for supply is made by P.H.E Department, local bodies, Gram Panchayats or any organization made responsible by the Government to maintain these.

2. Character of services

Alternating current, 50 hertz, single phase/ three phase, 230 / 400 volts, upto 75 KW/100 BHP.

3. Tariff

	Category of consumers	Fixed charge	Energy charge (Rs. per unit)
	<u>LV-5: Public utilities</u>		
5.1	Rural area	Rs. 30/HP/Month or Rs. 40/KW/Month	1.50
5.2	Urban area	Rs. 30/HP/Month or Rs. 40/KW/Month	1.75

LV-6: TEMPORARY SUPPLY

1. Applicability

This tariff is for connections of temporary nature. The applicability shall be as given in the respective category rate schedule.

Temporary supply cannot be demanded by a prospective consumer as a matter of right but will normally be arranged by the licensee when a requisition is made giving due notice subject to technical feasibility.

2. Character of services

Alternating current, single phase/three phase, 50 hertz, 230 volts or above depending upon the availability of voltage of supply and at sole discretion of the licensee.

3. Tariff

Fixed charge and energy charge to be billed at 1.5 times the normal tariff as applicable to the corresponding categories.

Notes: -

- (a) Estimated energy consumption charge is payable in advance before serving the temporary connection subject to replenishment from time to time and adjustment as per final bill after disconnection.
- (b) No temporary connection shall be served without meter.
- (c) Meter hire shall be charged as per the schedule of miscellaneous charges. Part of a month shall be reckoned as full month for the purpose of billing.
- (d) Connection and disconnection charge shall be paid as per the schedule of miscellaneous charges.
- (e) Variable cost adjustment charge, if any, shall be levied at 1.5 times the prevailing rate in addition to above rates.
- (f) No rebates/concessions under any head shall be applicable to temporary connections.
- (g) Month for the purpose of billing of temporary supply shall mean 30 days from the date of connection or for further part thereof.
- (h) The billing demand shall be the demand requisitioned by the consumer or the highest maximum demand during the period of supply commencing from the month of connection ending with billing month, whichever is higher.
- (i) Any expenditure made by the licensee for providing temporary supply upto the point of supply, shall be paid by the consumer as per prescribed procedure.
- (j) Temporary connections shall not be served unless suitable capacitors, wherever applicable, are installed so as to ensure power factor of not less than 0.85 lagging.

7. TERMS AND CONDITIONS OF L.T. TARIFF

- 7.1 The energy will be supplied to the consumer ordinarily at a single point for the entire premises.
- 7.2 No new L.T. connection above 75 KW/100HP connected load shall be served.
- 7.3 All existing L.T. connections with connected load above 75KW/100HP shall avail H.T. supply by December 2005 failing which 7% additional charge shall be levied on total amount of monthly energy bill comprising of fixed charge/demand charge, energy charge and VCA charge, if any.

- 7.4 The connected load under the foregoing tariffs would mean the connected load entered into the agreement executed with the consumer even in cases where the actual connected load is less than the consumers load entered in the agreement.

Connected load or contact/maximum demand in fraction shall be rounded off to the next whole number.

- 7.5 The consumers under the foregoing tariffs, except the installations having only lights and fans in the connected load, shall maintain an average power factor not less than 0.85 in any month.
- 7.6 For the purpose of tariff LV-4.4, the maximum demand of the consumer in each month shall be twice the largest amount of Kilo Watt hours delivered at the point of supply of the consumer during any consecutive thirty minutes in that month.

7.7 Meter Hire

Meter hire shall be charged as per the schedule of miscellaneous charges. Part of a month shall be reckoned as full month for the purpose of billing.

7.8 Rounding off:-

All bills will be rounded off to the nearest rupee.

7.9 Excess Supply

- 7.9.1 The foregoing tariffs (except tariff-LV-1 and LV 4.4) are applicable to the extent of the connected load indicated in the agreement executed between the Board and the consumer. In case the connected load in the consumer's premises is at any time found in excess of what has been agreed to between the consumer and the Board, the consumer shall have to pay in respect of **tariffs (fixed and energy charge including minimum charge)** corresponding to the excess load at the rate of **1.5 times** the normal tariff (inclusive of variable cost adjustment charge, if any), for previous six months (including the month in which the existence of excess load is detected).
- 7.9.2 The consumers availing supply at tariff LV-4.4 of the Low Tension Tariff should at all times restrict their actual maximum demand to the contract demand. In case the actual maximum demand in any month exceeds the contract demand, the said tariffs (LV-4.4) shall apply only to the extent of the contract demand and corresponding units of energy. The demand in excess of contract demand and corresponding units of energy (hereinafter referred to as "Excess Supply") shall be treated as power supplied and availed of separately for billing purposes. The excess supply so availed, if any, in any month shall be charged at the rate of **one and half times (1.5 times)** the normal tariff applicable to the consumer and while doing so, other terms and conditions (viz. tariff

minimum, charges for low power factor, etc.) of tariff shall also be applicable on the said excess supply. For the purposes of billing of excess supply, the billing demand and the units of energy shall be determined as under:

- (a) Billing demand: The demand in excess of the contract demand in any month shall be the billing demand.
- (b) Units of Energy: the units of energy corresponding to KWs of the portion of the demand in excess of the contract demand shall be:-

$$\text{TU} - \frac{\text{TU} \times \text{CD}}{\text{MD}}$$

Where,

TU – denotes total units supplied during the month;
 CD – denotes contract demand, and
 MD – denotes actual maximum demand

- 7.9.3 The “excess supply” availed in any month shall be charged along with the monthly bill and shall be payable by the consumer therewith.
- 7.9.4 The above excess billing at 1.5 times the normal tariff, as the case may be, applicable to consumers is without prejudice to the Board’s / Licensee’s right to discontinue the supply in accordance with the provisions contained in the Board’s General Conditions for Supply of Electrical Energy and Scale of Miscellaneous and General Charges / Chhattisgarh State Electricity Supply Code.
- 7.10 Surcharge of 75 (seventy five) paise per unit shall be levied on the consumption to all LT installations with welding transformers in the connected load unless suitable capacitors are installed so as to ensure power factor of not less than 0.85 lagging.

Notes:-

- (i) The power factor surcharge is applicable to installations with welding transformers where the connected load of welding transformers exceeds 25% of the total connected load.
- (ii) The surcharge shall be applicable to the entire monthly consumption of the installation.
- (iii) For the purposes of computing the connected load in KW or HP of the welding transformers, a power factor of 0.6 shall be applied to the maximum current of KVA rating of such welding transformers.
- (iv) Ordinarily, no new supply to LT installations with welding transformers will be given unless suitable capacitors so as to ensure power factor of not less than 0.85 lagging, are installed.

- (v) The decisions of the Executive Engineer of the Board / Licensee, as to the adequacy or otherwise of the power factor improvement device installed, shall be binding on consumers.

7.11 Every LT industrial/non-domestic power consumer whose connected load includes induction motor/s of capacity of 3 BHP and above, shall arrange to install Low Tension Shunt Capacitors at his cost across the terminals of his motors of the rating specified herein below: -

Sl. No.	Rating of individual Induction motor.	KVA rating of LT capacitors
1.	3 BHP and above up to 5 BHP	1
2.	Above 5 BHP to 7.5 BHP	2
3.	Above 7.5 BHP to 10 BHP	3
4.	Above 10 BHP to 15 BHP	4
5.	Above 15 BHP to 20 BHP	5
6.	Above 20 BHP to 30 BHP	6
7.	Above 30 BHP to 40 BHP	7
8.	Above 40 BHP to 50 BHP	8
9.	Above 50 BHP to 100 BHP	9

Notes: -

- (i) No new supply to LT power installations (except agriculture connections up to 5 HP) with induction motor/s of capacity 3 BHP and above will be given unless suitable capacitors to improve the power factor are installed.
- (ii) Any existing LT power consumer (except agriculture connection having load upto 5 HP) who fails to provide LT capacitor of specified rating or any consumer, to whom supply is given without installing capacitor of specified rating, shall pay surcharge of 30 (thirty) paise per unit in respect of consumption of the entire installation during the month.
- (iii) All existing agriculture connections having load above 5 HP shall provide L.T. capacitors of specified rating by 31/12/2005 failing which they shall pay surcharge of 30 (Thirty) paise per unit in respect of consumption during the month.

This surcharge shall be paid on the assessed units by the flat rate such agriculture connection, till they are metered .
- (iv) Levy of power factor surcharge as indicated herein shall be without prejudice to the rights of the Board/ Licensee to disconnect the consumer's installation if steps are not taken to improve the power factor by installing suitable shunt capacitors.

7.12 Late Payment Surcharge

If bills are not paid by the consumers within the period (due date) prescribed, a surcharge of 1.5% per month subject to minimum of Rs.5/- per month on the total amount of monthly bill (including outstanding arrears) will be payable in addition from the billing date.

7.13 Applicability of tariff

In case of any dispute on applicability of tariff on a particular LT category, the decision of the Commission shall be final and binding.

7.14 VCA Charge

Variable cost Adjustment charge, if any, shall be levied in addition to energy charge.

7.15 Tax or duty

The tariff does not include any tax or duty, etc. on electrical energy that may be payable at any time in accordance with any law then in force. Such charges, if any, shall be payable by the consumer in addition to tariff charges.

7.16 Contrary to the agreement

All conditions prescribed herein shall be applicable to the consumer notwithstanding the provisions, if any, in the agreement entered into by the consumer with the licensee, being to the contrary.

TARIFF SCHEDULE FOR HIGH TENSION CONSUMERS

HV-1: RAILWAY TRACTION

1. Applicability

This tariff is applicable to the Railway for Traction loads only.

2. Character of Service

Alternating current (A.C.), two phase, 50 hertz, 220KV or 132KV.

3. Tariff:

	Category of consumer	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KVAh)
HV-1	Railway Traction on 220KV/132KV	300	2.80

4. Minimum Charge

The consumer will guarantee a minimum monthly payment of energy charge of the units (KVAh) equivalent to 25% load factor of the contract demand plus the demand charge on the billing demand for the month irrespective of whether any energy is consumed during the month or not. An average power factor of 0.90 will be applied for the calculation of corresponding units at 25% load factor on contract demand.

5. Determination of Demand

The maximum demand of the supply in each month shall be four times the largest number of Kilo Volt Ampere hours (KVAh) delivered at the point of supply during any consecutive 15 minutes during the month as per the sliding window principle of measurement of demand.

Provided that if as a result of an emergency in the consumer's installation or in the transmission lines supplying energy to the said traction sub-station, extra load is taken by the consumer with prior intimation to the licensee, the period of such emergency shall not be taken in to account for the purpose of working out the maximum demand.

Provided further that if as a result of emergency in the traction sub-station (TSS) or in the transmission line supplying power load of the TSS or part thereof is transferred to adjacent TSS, the maximum demand (MD) for the month shall not be taken as less than the average MD recorded for the previous three months during which no emergency had occurred.

6. The condition of power factor incentive/penalty shall not be applicable as the energy charges are billed on KVAh.

HV-2: COAL MINES

1. Applicability

This tariff is applicable to the coal mines for power, ventilation, lights, fans, coolers etc. which shall mean and include all energy consumed for coal mines; lighting in the offices, stores, canteens, compound lighting, etc. and consumption for residential use therein.

2. Character of Services

Alternating current, 3 phase, 50 hertz., 132KV or below depending upon the availability of voltage of supply and at the sole discretion of the licensee/CSEB.

3. Tariff

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-2	Coal Mines		
2.1	132KV Supply	300	3.25
2.2	33KV Supply	325	3.35

4. Minimum Charge

a) For 132KV Supply

The consumer will guarantee a monthly minimum payment of charges for the units equivalent to 40% load factor on the contract demand (CD) plus the demand charges on the billing demand for the month, irrespective of whether any energy is consumed or not.

b) For 33KV Supply

Demand charge on the contract demand (CD) will be the monthly minimum charge whether any energy is consumed during the month or not.

5. Determination of the Demand

The maximum demand in each month shall be two times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 30 minutes during the month as per sliding window principle of measurement of demand.

HV-3 CEMENT FACTORIES

1. Applicability

This tariff is applicable to the cement factories for power, lights and fans, coolers, etc. which shall mean and include all energy consumed in factory, offices, stores, canteen, compound lighting, etc. and the consumption for residential use therein.

2. Character of service

Alternating current, 3 phase, 50 hertz, 220 KV or below depending upon the availability of the voltage of supply and at the sole discretion of CSEB/licensee.

3. Tariff:

	Category of Consumers	Demand Charges (Rs./KVA/month)	Energy Charges (Rs./KWh)
HV-3	Cement Factories		
3.1	220/132 KV Supply	300	3.50
3.2	33 KV Supply	310	3.60

4. Minimum Charge:

a) For 220/132 KV Supply

The consumer will guarantee a minimum monthly payment of charges of the units (KWh) equivalent to 40% load factor on the contract demand plus demand charges on the billing demand for the month irrespective of whether any energy is consumed during the month or not.

b) For 33 KV Supply

The demand charge on contract demand is a monthly minimum charge whether any energy is consumed during the month or not.

5. Determination of the demand

The maximum demand of the supply in each month shall be two times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 30 minutes during the month as per sliding window principle of measurement of demand.

6. Load factor concession

Load Factor (LF)	Concession
(a) Consumption over 60% and up to 70% load factor on contract demand (CD)	2.5% concession on normal energy charges of additional energy consumption over and above 60% LF.
(b) Consumption over 70% and up to 80% load factor on contract demand.	5% concession on normal energy charges of additional energy consumption over and above 70% LF.
(c) Consumption over 80% load factor on contract demand	7.5% concession on normal energy charges of additional energy consumption over and above 80% LF.

HV-4: HEAVY INDUSTRIES

1. Applicability

This tariff is applicable to heavy industries with CD above 20 MVA like Bhilai Steel Plant, BALCO, etc. for power, lights, fans, coolers, etc. which shall mean and include all energy consumed in factory, offices, stores, canteen, compound lighting etc. and residential and general use therein.

2. Character of Services

Alternating current, 3 phase, 50 hertz, 220 or 132 KV.

3. Tariff:

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-4	Heavy Industries		
4.0	220/132 KV Supply	380	3.15

4. Minimum Charge

The consumer will guarantee a minimum monthly payment of charges of the units (KWh) equivalent to 40% load factor on the contract demand plus demand charges on the billing demand for the month irrespective of whether any energy is consumed during the month or not.

5. Determination demand

The maximum demand of the supply in each month shall be four times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 15 minutes during the month as per sliding window principle of measurement of demand.

HV-5 POWER INTENSIVE INDUSTRIES

1. Applicability

This tariff is applicable to power intensive industries up to 20 MVA CD like mini steel plants, rolling mills, mini steel plant with rolling mills/sponge iron plants (in the same premises), Ferro alloys, for power, lights and fans, coolers, etc. which shall mean and include all energy consumed in factory, offices, stores, canteen, compound lighting, etc. and the consumption for residential use therein.

2. Character of service

Alternating current, 3 phase, 50 hertz, 220 KV or below depending upon the availability of the voltage of supply and at the sole discretion of CSEB/licensee.

3. Tariff

	Category of Consumers	Demand Charges (Rs./KVA/month)	Energy Charges (Rs./KWh)
HV-5	Power Intensive Industries		
5.1	220/132 KV Supply	260	2.55
5.2	At 33 KV Supply	275	2.65

4. Minimum Charge

a) For 220/132 KV Supply

The consumer will guarantee a minimum monthly payment of charges of the unit (KWh) equivalent to 30% load factor on the contract demand plus demand charges on the billing demand for the month irrespective of whether any energy is consumed during the month or not.

b) For 33 KV Supply

The demand charge on contract demand is a monthly minimum charge whether any energy is consumed during the month or not.

5. Determination of the demand

The maximum demand of the supply in each month shall be four times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 15 minutes during the month as per sliding window principle of measurement of demand.

6. Load factor concession

Load Factor (LF)	Concession
(a) Consumption over 50% and up to 60% load factor on contract demand (CD)	2.5% concession on normal energy charges of additional energy consumption over and above 50% LF.
(b) Consumption over 60% and up to 70% load factor on contract demand.	5% concession on normal energy charges of additional energy consumption over and above 60% LF.
(c) Consumption over 70% load factor on contract demand	7.5% concession on normal energy charges of additional energy consumption over and above 70% LF.

HV-6: OTHER H.T. INDUSTRIES

1. Applicability

This tariff is applicable to electro-chemical and electro-thermal units and all other industries not covered under categories HV-1 to HV-5 for power, lights, fans, coolers, etc. which shall mean and include all energy consumed in factory, offices, stores, canteen, compound lighting, etc. and residential use therein.

2. Character of Services

Alternating current, 3 phase, 50 hertz., 33KV or below depending upon the availability of the voltage of supply and at sole discretion of the CSEB/licensee.

3. Tariff:

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-6	Other H.T. Industries		
6.1	33KV Supply	340	3.15
6.2	11KV Supply	350	3.20

4. Minimum Charge

For 33/11 KV Supply

The demand charge on contract demand is a monthly minimum charge whether any energy is consumed during the month or not.

5. Determination of the Demand

The maximum demand of supply in each month shall be two times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 30 minutes during the month as per sliding window principle of measurement of demand. However, for fluctuating loads, the maximum demand for supply in each month shall be four times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 15 minutes during the month as per sliding window principle of measurement of demand.

HV-7: GENERAL PURPOSE RESIDENTIAL COLONY

1. Applicability

This tariff shall be applicable primarily for supply to township including township of industries having mixed load.

2. Character of Services

Alternating current, 3 phase, 50 hertz., 220KV or below depending upon the availability of the voltage of supply and at sole discretion of the CSEB/licensee.

3. Tariff

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-7	General Purpose Residential Colony		
7.1	220/132KV Supply	225	2.50
7.2	33KV Supply	250	2.60
7.3	11KV Supply	275	2.70

4. Minimum Charge

Demand Charge on contract demand is a monthly minimum charge whether any energy is consumed during the month or not.

5. Determination of the Demand

The maximum demand of supply in each month shall be two times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 30 minutes during the month as per sliding window principle of measurement of demand.

HV-8: GENERAL PURPOSE NON-INDUSTRIAL

1. Applicability

This tariff is applicable for supply to establishment like Railway (other than traction), hospitals, offices, hotels, institutions, etc. having mixed load.

2. Character of Services

Alternating current, 3 phase, 50 hertz., 220/132KV or below depending upon the availability of the voltage of supply and at sole discretion of the CSEB/licensee.

3. Tariff

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-8	General Purpose Non-Industrial		
8.1	220/132KV Supply	300	3.50
8.2	33KV Supply	325	3.60
8.3	11KV Supply	350	3.75

4. Minimum Charge

For 220/132 KV Supply

The consumer will guarantee a minimum monthly payment of charges of the unit (KWh) equivalent to 20% load factor on the contract demand plus demand charges on the billing demand for the month irrespective of whether any energy is consumed or not.

For 33/11 KV Supply

The demand charge on contract demand is a monthly minimum charge whether any energy is consumed during the month or not

5. Determination of the Demand

The maximum demand of supply in each month shall be two times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 30 minutes during the month as per sliding window principle of measurement of demand.

HV-9: PUBLIC WATER WORKS

1. Applicability

This tariff is applicable to public utility water supply schemes, sewerage treatment plants and sewerage pumping installations run by P.H.E. Department, local bodies, Gram Panchayat or any organization made responsible by the Government to supply/maintain public water works/ sewerage installation including energy used for lighting pump house.

2. Character of Services

Alternating current, 3 phase, 50 hertz., 33KV or below depending upon the availability of the voltage of supply and at sole discretion of the licensee/CSEB.

3. Tariff

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-9	Public Water Works		
9.1	33KV Supply	150	2.00
9.2	11KV Supply	160	2.05

4. Minimum Charge

The demand charge on contract demand is a monthly minimum charge whether any energy is consumed during the month or not.

5. Determination of the Demand

The maximum demand of supply in each month shall be two times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 30 minutes during the month as per sliding window principle of measurement of demand.

HV-10: HT IRRIGATION

1. Applicability

This tariff is applicable to agriculture pump connections, irrigation pumps of lift irrigation schemes of State Government or its agencies/co-operative societies including energy used for lighting pump house.

2. Character of Services

Alternating current, 3 phase, 50 hertz., 33KV or below depending upon the availability of the voltage of supply and at sole discretion of the licensee/CSEB.

3. Tariff

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-10	HT Irrigation		
10.1	33KV Supply	75	2.00
10.2	11KV Supply	80	2.05

4. Minimum Charge

The tariff is subject to payment of minimum annual consumption of 900 units per kVA of the highest maximum demand recorded during the year or the contract demand, whichever is higher.

5. Determination of the Demand

The maximum demand of supply in each month shall be two times the largest number of Kilo Volt Ampere hours delivered at the point of supply during any consecutive 30 minutes during the month as per sliding window principle of measurement of demand.

HV-11: HT TEMPORARY CONNECTION:

1. Applicability

This tariff is applicable to connections of temporary nature.

2. Character of Services

Alternating current, 3 phase, 50 hertz., 33KV or below depending upon the availability of the voltage of supply and at sole discretion of the licensee/CSEB.

3. Tariff

	Category of consumers	Demand charge (Rs./KVA/month)	Energy charge (Rs. per KWh)
HV-11	Temporary connection		
11.1	33KV Supply	1.5 times the standard HT Tariff applicable for that category with VCA charge, if any.	
11.2	11KV Supply		

4. Notes:

- The billing demand shall be the demand requisitioned by the consumer or the highest monthly maximum demand during the period of supply commencing from the month of connection ending with the billing month, whichever is higher.
- The prevailing VCA charge, if any, at the time of availing supply shall not be further adjusted.
- The month for the purpose of temporary supply shall mean 30 days from the date of connection or for further part thereof.
- The consumer shall pay the estimated energy charges in advance, before serving of the temporary connection subject to replenishment from time to time and adjustment as per final bill after disconnection.
- Any expenditure made by the CSEB/licensee up to the point of supply shall be paid by the consumer as per prescribed procedure.
- The consumer shall pay rent for the metering system.
- Connection and disconnection charges shall be paid separately.

- (h) Other terms and conditions of the relevant category of tariff shall also be applicable.
- (i) Surcharge at 2% per month on the outstanding amount of the bill shall be payable in addition from the date of bill, if the bill is not paid by the consumer within the period prescribed.
- (j) Temporary connection shall not be served unless suitable capacitors are installed so as to ensure power factor of not less than 0.90.

12. TIME OF DAY TARIFF

Under the Time of Day (TOD) Tariff, electricity consumption and maximum demand in respect of HT consumers for different periods of the day, i.e. normal period, peak load period and off-peak load period, shall be recorded by installing a TOD meter. The maximum demand and consumption recorded in different periods shall be billed at the following rates on the tariff applicable to the consumer:

1. Demand Charges	Normal rate of Demand Charge
PLUS	
2. Energy Charge	
Period of Energy Consumption	Rate (Rs. per unit)
(i) Normal period (5:00 a.m. to 5:00 p.m.)	normal rate of Energy Charges
(ii) Evening peak load period (5:00 p.m. to 11:00 p.m.)	130% of normal rate of Energy Charge
(iii) Off-peak load period (11:00 p.m. to 5:00 a.m.)	80% of normal rate of Energy Charge

Applicability and Terms & Conditions of TOD tariff:

- (i). The facility of aforesaid TOD tariff shall not be available to HT consumers having captive power plants and/or availing supply from other sources through wheeling of power and to those availing supply for hospitals, water works, coal mines, railway traction, irrigation, general purpose residential, general purpose non-industrial and those availing temporary supply.
- (ii). The HT industrial consumers, who have installed stand-by generating plants having capacity of less than 30% of contract demand, shall be eligible for the aforesaid TOD tariff.
- (iii). After electing TOD tariff, if any industrial HT consumer on account of some reasons wants to go back to the earlier tariff according to the agreement, this facility shall be available to him only once in two years.
- (iv). The actual monthly consumption of such HT consumer, whose monthly minimum charges are based on units, is less than minimum consumption, then the difference (deficit) of units between the

minimum consumption and actual consumption shall be billed at normal rate of energy charge prescribed for “Normal Period”.

- (v). In the event of applicability of TOD tariff to a consumer, the terms and conditions of the applicable tariff (such as monthly tariff minimum charge, etc.) shall continue to apply.
- (vi). In case, the consumer exceeds the contract demand, the demand in excess and the corresponding energy shall be billed twice the normal tariff applicable for the day time i.e. 5:00 a.m. to 5:00 p.m. irrespective of the time of use.

13. TERMS AND CONDITIONS OF HT TARIFF:

All the foregoing HT tariffs are subject to the conditions prescribed hereunder:-

- 13.1** The foregoing tariffs for different supply voltage are applicable for loads with contract demand as below:

Supply Voltage		Minimum		Maximum	
11	KV	60	KVA	300	KVA
33	KV	200	KVA	10000	KVA
132	KV	4000	KVA	40000	KVA
220	KV	15000	KVA	150000	KVA

Deviation, if any, in respect of the above provisions on account of technical reasons may be permitted with the consent of the Commission.

13.2 Point of Supply

Power will be supplied to consumers ordinarily at a single point for the entire premises. In certain categories like coal mines, power may be supplied at more than one point on the request of consumer subject to technical feasibility. But in such a case, metering and billing will be done separately for each point of supply.

13.3 Billing demand

The billing demand for the month shall be the actual maximum KVA demand of the consumer during the month or 75% of the contract demand or 60KVA, whichever is higher. The billing demand shall be rounded off to the nearest integral figure, the fraction of 0.5 or above will be rounded to the next higher figure and the fraction of less than 0.5 shall be ignored.

13.4 Power Factor Incentive/Penalty

- (a) If the average monthly power factor of the consumer increases above 95%, he shall be paid an incentive at the following rate :

For each one percent increase by which his average monthly power factor is above 95%	-	One percent (1%) of the total amount of the bill under the heads of 'Demand Charge' and 'Energy Charge'
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(b) If average monthly power factor of the consumer falls below 90%, he shall pay in addition at the following rate:

For each one percent by which his average monthly power factor falls below 90%	-	One percent (1%) of the total amount of the bill under the heads of 'Demand Charge' and 'Energy Charge'
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(c) If average monthly power factor of the consumer falls below 85%, he shall pay in addition at the following rate :

For each one percent by which his average monthly power factor falls below 85%	-	Two percent (2%) of the total amount of the bill under the heads of 'Demand Charge' and 'Energy Charge'
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(d) Should the power factor fall below 70%, the Board reserves the right to disconnect the consumer's installation. Power may be restored only after steps are taken to improve the same to the satisfaction of the Board/licensee. This is, however, without prejudice to the levy of penal charges for low power factor in the event of supply not being disconnected.

(e) For this purpose, the "average monthly power factor" is defined as the ratio of total 'Kilo Watt hours' to the total 'Kilo Volt Ampere hours' recorded during the month. This ratio will be rounded off to two figures, 5 or above in the third place after decimal being rounded off to the next higher figure in the second place before decimal.

(f) Notwithstanding what has been stated above, if the average power factor of a new consumer is found to be less than 90% at any time during the first 6 (six) months from the date of connection, he shall be entitled to a maximum period of six months to improve it to not less than 90% subject to following conditions:-

- (i) This period of six months shall be reckoned from the date on which the average power factor was found, for the first time, to be less than 90%.
- (ii) In all cases, the consumer will be billed the penal charges for low power factor, but in case he maintains the average power factor in subsequent three months (thus in all four months) at not less than 90%, the charges on account of

low power factor billed during the said six months period, shall be withdrawn and credited in next monthly bills.

- (iii) The facility, as mentioned herein, shall be available not more than once to new consumers whose average power factor is less than 90% at any time during six months from the date of connection. Thereafter the charges on account of low average power factor, if found less than 90%, shall be payable as by any other consumer.

13.5 Average Power Factor

An average power factor 0.9 will be applied on the contract demand for calculation of corresponding units at different load factors.

13.6 VCA Charge

Variable cost adjustment (VCA) charge, if any, shall be levied in addition to energy charge.

13.7 Rounding off

All bills will be rounded off to the nearest rupee.

13.8 Meter Hire

Meter hire shall be charged as per Schedule of Miscellaneous Charges. Part of a month will be reckoned as full month for the purpose of billing.

13.9 Delayed Payment Surcharge

Surcharge at 1.5% per month on outstanding amount of the bill up to 30 days and 2.0% per month thereafter will be payable in addition, from the date of the bill, if the bill is not paid by the consumer within the period prescribed.

13.10 Additional Charge for Exceeding Contract Demand

The consumers should at all times restrict their actual maximum demand to the contract demand. In case the actual maximum demand in any month exceeds the contract demand, the foregoing tariffs shall apply only to the extent of the contract demand and corresponding units of energy. The demand in excess of contract demand and corresponding units of energy (hereafter referred to as "excess supply") shall be treated as power supplied and availed separately for billing purposes. The excess supply so availed, if any, in any month shall be charged at **one and half times (1.5 times)** the normal tariff applicable to the consumer and while doing so other provisions of electricity tariff (such as tariff minimum charge, power factor charge, etc.) will also be applicable on aforesaid excess supply, unless otherwise provided specifically for any category.

For the purpose of billing of excess supply, the billing demand and the units of energy shall be determined as under:-

(i) **Billing Demand / Contract Demand:**

The demand in excess of the contract demand in any month shall be the billing demand/ contract demand of the excess supply.

(ii) **Units Energy:**

The units of energy corresponding to KVAs of the portion of the demand in excess of the contract demand shall be:

$$TU - \frac{TU \times CD}{MD}$$

Where,

TU-denotes total units supplied during the month

CD-denotes contract demand and

MD-denotes actual maximum demand

The excess supply availed in any month shall be charged alongwith the monthly bill and shall be payable by the consumer.

The billing of excess supply at 1.5 times the normal tariff applicable to consumer is without prejudice to the Board's/ licensee's right to discontinue the supply in accordance with the provisions contained in the Board's General Conditions of Supply and Scale of Miscellaneous and General Charges/Chhattisgarh State Electricity Supply Code.

13.11 Additional Charge

The existing consumers with contract demand exceeding 10000 KVA who have been permitted to continue to avail supply at 33 KV shall be required to pay additional charge at 7% on the total amount of the bill at 33KV. The aforesaid additional charge at 7% shall be levied on the total amount of the bill comprising of demand charge, energy charge and variable cost adjustment charge. Further, if the existing consumers, as aforesaid, having contract demand of less than 10,000 KVA require additional power, resulting in the total contract demand exceeding 10000 KVA, then they shall be required to take the total supply at 220/132KV at the relevant tariff for supply at 220/132 KV, from the date the enhanced contract demand (including the additional power) becomes effective.

13.12 Tax or Duty

The tariff does not include any tax or duty, etc. on electrical energy that may be payable at any time in accordance with any law / State Government Rules in force. Such charges, if any, shall be payable by the consumer in addition to tariff charges.

13.13 Dispute on applicability of tariff

In case of any dispute on applicability of tariff on a particular category of HT industry/ consumer, the decision of the Commission shall be final and binding.

13.14 Contrary to the Agreement

Notwithstanding the provisions, if any, contrary to the agreement entered into by the consumer with the Board/ licensee, all conditions prescribed herein shall be applicable to the consumer.

SCHEDULE OF MISCELLANEOUS AND GENERAL CHARGES

S.No.	Particulars	Existing	Approved by CSERC
1.	Meter Hire Charge		
a)	Single Phase LT.	Rs. 12/- P.M.	Rs. 12/- P.M
b)	Poly Phase LT.		
(i)	Upto 100 Amp.	Rs. 25/- P.M	Rs. 25/- P.M
(ii)	LT.CT. Meter	Rs. 45/- P.M	Rs. 50/- P.M
(iii)	Demand or special type Meter.	Rs. 184/- P.M or 2.3% of cost of meter, box, cable CT, etc. (whichever higher)	Rs. 200/- P.M
c)	11 KV Meter with box, cable, CT etc.	Rs. 1540/- P.M	Rs. 900/- PM
d)	33 KV metering System	Rs. 2040/- P.M	Rs. 1500/- P.M
e)	132 KV metering System.	Rs. 16120/- P.M	Rs. 20000/- P.M
f)	220 KV metering system.	Rs. 32730/-	Rs. 35000/- P.M
2.	For single phase & three phase connection up to 5 KW		
a)	Changing meter Board in same premises.	Actual cost + 15% supervision Charge.	Rs.50/-
b)	Changing meter at consumer's request in same premises.	Rs. 52/-	Rs.50/-
c)	Re-sealing Board's cut out in consumer's premises.	Rs. 13/-	Rs.15/-
3.	Re-sealing meters, MD indicators of CSEB in consumer's premises		
a)	Single phase L&F connection.	Rs. 65/-	Rs. 80/-
b)	Single phase Power connection.	Rs. 112/-	Rs. 135/-
c)	Three phase LT Connection.		
(i)	Industrial up to 10 HP.	Rs. 214/-	Rs. 250/-
(ii)	Industrial above 10 HP.	Rs. 437/-	Rs. 500/-
(iii)	Irrigation connection upto 5 HP.	Rs. 65/-	Rs. 65/-
(iv)	Irrigation connection above 5 HP.	Rs. 108/-	Rs.110/-
d)	H.T. connection.	Rs. 865/-	Rs.1000/-
4.	Meter Testing Charges at consumer's request.		
a)	Single Phase Meter	Rs. 100/-	Rs.100/-
b)	3 phase, 4w meter, without C.T. meter	Rs. 300/-	Rs.150/-
c)	3 phase, 4w meter, with C.T. meter	Rs. 900/-	Rs.1050/-
d)	L.T. C.T	Rs. 200/- each	Rs. 300/- each
e)	Special Bi-Vector, Tri-Vector Meter	Rs. 600/-	Rs.1000/-
f)	33 KV or 11 KV Metering equipment	Rs. 2000/-	Rs.3000/-
g)	132 KV/220 KV Metering equipment	-	Rs.5000/-
5.	Contest fee		
a)	L.T. meter	-	1.5 times of testing charges
b)	H.T. meter	-	2 times of testing charges

6	Special meter reading a) L.T. connection b) H.T. connection	- -	Rs.20/- Rs.200/-
7.	Replacement of burnt meter.	-	Cost of meter +15% supervision charges
8..	Fuse call charges – Replacement a) Board's cut out fuse b) L.T. Consumer's fuse (i) New installation (ii) Otherwise	Rs. 13/ Rs. 11/- Rs. 13/-	Rs.15/- Rs.15/- Rs.20/-
9.	Replacement of missing meter card	Rs. 7/-	Rs.10/- per card
10.	Replacement of broken glass of meter	Rs. 24/- per glass	Rs.30/- per glass
11.	Reconnection/disconnection charge a) Up to 10 KW (at cut out or overhead mains) (i) Over head mains (a) Single Phase (b) Three Phase (ii) Underground mains b) Over 10 KW upto 75 KW (overhead / underground) c) Over 75 KW upto 5MVA d) Above 5MVA upto 25MVA e) Above 25MVA	Rs.130/- Rs.391/- Add 25% charges to above Actual+25 % Actual+25 % Actual+25 %	Rs.50/- Rs.125/- Rs.500/- Rs.500/- Rs.1000/- Rs.1250/- Rs.2000/-
12.	Re-checking of installation on request of consumer a) Single Phase b) Three Phase	Rs.97/- per apparatus	Rs.100/- per installation Rs.300/- per installation
13.	Re-rating of equipment	-	Rs.100/- per equipment
14.	Supervision Charge for Service connection a) Single Phase b) Three Phase (i) Upto 10 KW connected load (ii) Above 10 KW upto 75 KW CL c) Loop connections L.T. single phase	Rs. 175/- Rs. 300/- (upto 5 KW) Rs. 411/- (above 5 KW to 10 KW) 15% of actual cost of service connection or Rs. 426/- whichever more Rs. 80/-	Rs.175/- - Rs. 350/- Rs. 450/- Rs.80/-
15.	System strengthening charge for affording connections in colonies developed/being developed by colonizers/Builders/Society/Developing agencies etc.	Rs. 1250/- per KW	Rs.1250/- per KW

16.	Supply arranging charge a) For three phase L.T. connections upto 100 HP (except F.M. and pumps in rural area) Free LT/HT line length Max. - 0.5Km b) For 11/33 KV HT connections. Free line length: i) 11KV 2 Km ii) 33KV (a) Up to 2500 KVA- 5 Km (b) Above 2500-5000 KVA- 7.5Km (c) Above 5000 KVA - 10 Km [Add'nl cost to be borne by consumer] c) 132/220 KV EHT connection	Rs. 440/- per H.P. Rs. 550/- per KVA of CD -	Rs.740/- per KW Rs.650/- per KVA of C.D. Rs.650/- per KVA or actual cost of work+15% Supervision charges, whichever higher
17.	Works got to be executed by consumer's contractor	Supervision charge on cost of (material +labour)	15% supervision charges on entire cost of work including cost of materials and labour charges.
18.	Laying of dedicated feeder on consumer's request	Cost of extension + 15% Supervision charge	Cost of Extension +15% Supervision charges.
19.	Parallel operation charge for availing grid support by CPP	-	Rs.16/- per KVA per month on the installed capacity of the CPP
20.	Shifting of connection	-	Actual cost of material +15%Supervision charge
21	Hiring of Board's plant and equipment (i) For initial agreement period. (ii) For subsequent period of agreement (iii) For L.T. consumers (more than 100 HP) requiring to convert to H.T.	2% P.M. of current market price of equipment 4% P.M. -	2% P.M. on current schedule of rates. Twice the above (i) Same as in (i) & (ii) above
22.	Transfer of name		
a).	L.T.	Rs. 100/-	Rs.100/-
b).	H.T.	Rs. 2000/-	Rs.2000/-
23.	Booklet for HT/LT Tariff	-	Rs.20/-
24	Service charge for dishonored cheque	-	Rs.200/-

Note- Other charges being levied by CSEB and not included in the Schedule of Miscellaneous and General Charges shall continue to be levied by the Board without any change till further orders.

Chapter 7: Variable Cost Adjustment (VCA)

7.1 CSEB's Proposal

In its petition the Board has stated that the variation in the cost of power may be due to various reasons which may be grouped under "variable cost" ranging from price, quantity and generation mix, fixed and other cost variation such as wheeling charges, etc. The reasons for variation in the fuel cost and power purchase cost and other submissions made by the Board are as follows:

- (a) Changes in the source of generation and purchase to meet increased demand, system exigencies, unplanned shutdowns or forced outages, lack of fuel and reduction of hydro generation often compel the utility to deviate from its normal plan and necessitate procurement of energy from stations other than those which may be approved in the tariff order. But in such a situation, CSEB will take the responsibility to demonstrate to the Commission that it has exercised due diligence and has exhausted all possible sources.
- (b) Changes in the cost of fuel and related expenses, such as transportation, taxes, royalties, etc.
- (c) Changes in the operating parameters of generating stations.
- (d) Changes in the forecast of sales and losses, which will have an impact on power cost. In case of increase in supply to specific subsidized categories (usually agriculture, lifeline, rural domestic consumers, etc.), the Commission may allow variation in the cost to be passed through in tariff, but to the extent it is not covered by cross-subsidization. But if such increase is due to policy directive of the Government, the Commission may require the Government to bear the cost impact of such increase.
- (e) Any change in the method of regional accounting cost, which can have a substantial impact on the cost of power purchased from Central Generating Stations, specifically due to introduction of ABT.
- (f) The Board has submitted that after ascertaining the cause of increase, the Commission may allow the increase in the net cost due to rise in fuel price, but linking the increase due to deterioration of machines to the norms for efficient operation and O&M or Renovation/Modernization cost allowed in the ARR.

The CSEB has proposed the following Fuel Surcharge Adjustment (FSA) formula, based on the above considerations, for the energy purchased (restricted to the quantity mentioned in the tariff order) during quarter 'i', to be computed for each month and aggregated for the quarter 'i'-

$$F_i = (CC_i + P_i \times E_i + FC_i + Z + A_i) / Q_i$$

Where,

- CCi - is the difference in weighted average variable cost of own generating stations in the quarter 'i' from the base values in the last tariff order (Nil if Board is unbundled and generation made a separate company)
- Pi - is the difference in weighted average variable cost of power purchased in the quarter 'i' , compared to the cost in the last tariff order.
- Ei - is the energy purchased (in KWh) during the quarter for each of the generating stations. Board will identify the marginal stations used for meeting the excess energy requirement.
- FCi - is the difference in the actual total fixed charges of the generating stations including own generating stations from the base value in the last tariff order (Fixed charge of own generating stations shall not be considered if generation is unbundled in a separate generating company).
- Z - is the changes in the cost as allowed by the Commission for a period extending in the past beyond the relevant quarter.
- Ai - is the adjustment to account for the financial impact of demonstrated incidents of merit order violation on account of controllable factors or any other events, whose financial impact should be given appropriate treatment in the Commission's view.
- Qi - is the actual energy sold to all categories (except agriculture and SLP) in the quarter.

The CSEB has proposed computation of data (split for fixed and variable) for each generating station for the respective quarter, but the total amount of fuel surcharge shall be computed on an aggregate basis. The merit order dispatch schedule approved by the Commission is proposed to be followed strictly. The approved formula is proposed to be applied at the end of each quarter, without making it necessary to go through regulatory proceedings.

7.2 Views of the Commission

The Commission feels that looking to the wide scope of Fuel Surcharge Adjustment (FSA), it should be appropriately called the Variable Cost Adjustment (VCA) formula, which is intended to recover the unforeseen costs between the present and the next tariff revision.

The Commission is of the view that additional expenditure mainly on account of fuel or power purchase and on account of water charges, taxes and such unforeseen expenditure which are necessary but not provided in the tariff order should only be allowed to be recovered through VCA, but limited to the extent admissible as per approved efficiency parameters/norms.

The formula proposed by CSEB covers the variation in the cost of 'fuel' as well as 'fixed charges'. The latter is not acceptable to the Commission.

In the formula proposed, the difference in the weighted average variable cost is not linked to the efficiency norms/parameters. The increase in variable cost of generation should be linked to the efficiency norms (PUF and SHR) fixed by the Commission.

The Board has not linked the energy sold to T&D loss approved by the Commission. The energy generated from Board's own generating stations and fed in to the system is also not based on approved auxiliary consumption, which is necessary.

Reduction of T&D loss is one of the most important performance parameters set by the Commission in the tariff order. The Commission is of the view that total energy sold should be worked out from the energy fed into the system (quantity of power fed from the own generating stations + quantity of power purchased) minus the approved T&D loss (in M.U.s) or the actual T&D loss achieved, whichever is lower.

The exemption of VCA should be limited to agriculture consumers. The power sold to un-metered agriculture consumers should be based on load factor approved by the Commission. Similarly power sold to other un-metered category (presently SLP connections) should be assumed as approved by the Commission.

Variation in the charges on account of water charges, taxes, or any other unpredictable and unknown factors, not envisaged at the time of last tariff revision, shall be permitted, subject to prior approval of the Commission.

7.3 Commission's Order

In view of the above observations and taking into consideration all other relevant aspects and circumstances, the Commission hereby passes the following order:

The formula for determination of Variable (fuel & other) Cost Adjustment (VCA) as given in para 7.4 of this order is approved, subject to the following conditions:

- (i) The approved formula is subject to review, as the Commission may deem fit.
- (ii) Any cost increase by the Board by way of penalty, interest due to delayed payments, etc. and due to operational inefficiencies shall not be allowed.
- (iii) The basic nature of VCA is 'adjustment' i.e. passing on the increase or decrease, as the case may be.

- (iv) Incremental cost of power purchase due to deviation in respect of generation mix, power purchase at higher rate, etc. shall be allowed only if it is justified to the satisfaction of the Commission.
- (v) The operational parameters/norms fixed by the Commission in this tariff order shall be the basis of calculating VCA charges.
- (vi) VCA charges shall be levied on all categories of consumers, except agriculture consumers.
- (vii) The data in support of VCA claims shall be duly authenticated by a Chartered Accountant.
- (viii) The VCA charges shall be reviewed by the Board after every six months of the financial year

VCA Formula

$$\text{VCA (per/kwh)} = \frac{\text{Qc (RC2 - RC1) + Qo (RO2 - RO1) + Qpp (Rpp2 - Rpp1) + Vz + A}{(\text{QPg} + \text{QPP}) \times (1 - L) - \text{PSE}} \times 100$$

Where,

- Qc** = Quantity of Coal Consumed during the adjustment period (in M.T.)
= (SHR x QPg) (1 + TSL) x 1000 / GCV
- RC1** = Weighted average rate of coal supplied ex-power station coal yard as approved by the Commission for the adjustment period in Rs/M.T.
- RC2** = Weighted average rate of the coal supplied ex-power station coal yard as per actual for the adjustment period in Rs./M.T.
- Qo** = Quantity of oil (in KL) consumed during the adjustment period
= Generation (in MU) x Specific Oil consumption approved by the Commission (ml./kwh)
- RO1** = Weighted average rate of oil ex-power station (in Rs./KL) approved by the Commission for the adjustment period.
- RO2** = Weighted average actual rate of oil ex-power station supplied (in Rs./KL) during the adjustment period.
- QPg** = Board's own power generation (in MUs) at generator terminal – approved auxiliary consumption.
- QPP** = Power purchased from different sources and fed into Board's system.
- Rpp1** = Average rate of power purchase as approved by the Commission (in Rs./kwh)

- Rpp2** = Average actual rate of power purchased during the adjustment period (in Rs./kwh)
- VZ** = Amount of variable charges on account of change of cost of unknown factors like water charges, taxes or any other unpredictable and unknown factors not envisaged at the time of tariff fixation (subject to prior approval of the Commission).
- A** = Adjustment, if any, to be made in the current period to account for any excess/shortfall in recovery of fuel or power purchase cost in the past adjustment period, subject to the approval of the Commission.
- L** = T&D loss as approved by the Commission or actual, whichever is lower.
- PSE** = Power sold to exempted categories (presently agriculture).
- SHR** = Station Heat Rate as approved by the Commission.
- TSL** = Transit and Stacking Loss as approved by the Commission.
- GCV** = Gross Calorific Value of coal received as approved by the Commission.

Chapter 8: Directives to CSEB

The Commission has observed that there is ample scope in the operation of CSEB for reducing costs and increasing efficiency; but serious efforts are required to be made by the CSEB at all levels to achieve these twin goals. Significant initiatives are yet to be taken by the Board, even on operational, leave alone structural reforms envisaged under the Electricity Act, 2003. The present operational systems of the Board are those inherited from the erstwhile MPEB and these remain largely unchanged though old and inefficient and there seems to be no effort to change them. While the Commission appreciates that there is acute shortage of manpower at higher levels as also at the cutting-edge levels in the Board, what is disappointing is that there is also no serious effort to fill up these critical gaps. The Board lacks an effective management information system and good database on its operations. The result is that there is very little monitoring. An effective MIS could, to an extent, offset the disability imposed on the organization by lack of manpower.

The Board so far has no system by which the directions of this Commission may be brought to the notice of the top management in the organization and for taking action on the directions. The Commission has issued directions and advices on many important issues which have a direct bearing on the efficient operation of the Board. Effective steps to operationalise most of the directions have been slow in coming. The Commission would strongly advise that the Board to evolve a system through which action is promptly taken on the directions of the Commission and to monitor their implementation, as otherwise the whole purpose of regulation would be defeated and the State will lag behind in carrying out the reforms envisaged under the Electricity Act, 2003.

It is in the above context that the Commission is constrained to include in this order somewhat detailed directions relating to the operations of the CSEB. These directions relate to various issues, which have been discussed in the earlier chapters.

1. MIS

First and foremost, the Board has to take urgent steps to build a credible and accurate database and management information system with unbundled costs and expenditure of the three businesses of generation, transmission and distribution as well as information relating to the various customer classes so as to provide the stake holders access to information on costs and expenses of the Board and for basis for the determination of tariffs under performance based regime with some regulatory certainty. Advantage of IT must be taken to institute the MIS. Action must be initiated urgently on this and the next tariff petition must be supported by an accurate and credible database.

2. Energy Efficiency Cells at generating stations

Presently neither the Board has fixed the operational parameters of the generating centres nor is there any effective monitoring. The Commission feels that sustained efforts are required to improve the operating parameters of the generating stations. To monitor various parameters and suggest improvement in the functioning of generating stations, the Board should set up an Energy Efficiency Cell in each power plant which shall monitor coal consumption, coal handling, SHR, specific oil consumption, auxiliary consumption, break downs, pollution, etc. on a regular basis, examine the reasons for deviations and suggest measures to improve the same. The cell should be placed under a sufficiently senior officer. This must be done within a month.

3. Installation of weightometers in generation stations

A reliable system of measurement of losses in coal handling on a regular basis in all generating stations needs to be installed. Presently, there is no system to measure such losses. The Board should urgently arrange to install weightometers in the power houses so as to correctly calculate the receipt of coal and quantity fed to the boilers to assess with greater measure of accuracy the specific coal consumption and transit and stacking losses. Installation of weightometers should not take more than six months.

(Para-5.3.3)

4. Transformer failure

It is observed that CSEB has very high rate of transformer failure. The power transformer failure rate last year (FY05) was 2.56% and in case of distribution transformer, it was as high as 18.36%. In case of ESB transformers also it is very high. This has to be arrested. The CSEB must take necessary steps for reducing transformer failures to less than 2% and 10% respectively. The high failure-prone areas should be identified by the Board and a thorough checking be got done. Regular maintenance of transformers and lines will go a long way in reducing the rate of transformer failure. (Para 2.4.3)

5. Reduction of T&D losses

The Board has worked out the T&D losses at 38.96% during FY 05. Considering that EHT and HT sale constitute 70% of the total, this is very high. The Board is directed to immediately engage a competent consultant to study the level of T&D losses. Correct assessment of technical and commercial losses has got to be done at each voltage level. Since this would take time, the Board should get at least representative sample studies done in areas with predominantly, industrial / commercial / agricultural loads and also mixed load before the next tariff petition is filed. A long-term action plan for reduction of T&D losses both technical and non-technical, with relevant load flow studies be chalked out and submitted to the Commission before filing of the next

tariff petition. The Board is directed to take all possible measures to reduce the T&D losses to 35.81% during FY 06. (Para- 5.4.6 and 5.5.3)

6. Assessment of load factor of agriculture pumps

The Board should carryout sample studies for assessing the load factor of agriculture consumers covering proportionate number of agriculture consumers, based on connected load, area, region, cropping pattern, number of crops, type of water source, etc. The programme of such sample studies be got approved by the Commission within a month. (Para-5.5.3)

7. Energy audit and DSM

The Board shall take up the work of energy audit and adoption of demand side management practices. These works may be taken up in selected pockets, preferably in large industrial pockets such as Raipur, Bhilai, Bilaspur and Raigarh district and also in pockets of large agriculture consumption say Dhamtari, Rajim, Mahasamund, Durg, Balod, Kawardha and Rajnandgaon. The Board's own power stations, administrative office complexes and colonies should also be subjected to energy audit. The Board shall urgently take up energy audit of Raipur, Bhilai, Dhamtari, Durg and Rajnandgaon in the first phase and submit a quarterly report on the above.

The Commission, vide its letter No. 178/CSERC/2005 dated 12/05/05 has already issued detailed directions to the CSEB emphasizing the need for HT Energy Audit for curbing revenue loss. A copy of the same is appended as Annexure-1.

8. Cent percent metering

This is mandated under the Act and is the soul of the reforms in the distribution function. Under the provisions of Section 55 (1) of the EA' 05, the Commission has already passed orders permitting the Board time to provide meters to all consumers by March 2007. This work, however, would need to be closely monitored to prevent slippages. No new connection shall be served without meter. New agricultural connections above 5 HP load shall be served only with meters. (Para 6.12.3)

9. Replacement of stopped/defective meters

Over 2.25 lac meters of the existing consumers are reported stopped and defective since long. This accounts for 15% of the total metered connections in the State. The percentage of stopped/defective L.T. meters be brought down to 3% and 1.5% in cities/towns and in rural areas respectively by March 2006. A detailed order has already been passed by the Commission in this regard on 28th March 2005 in suo motu petition No. 1/05. The Board should follow the directive contained in this order.

10. Efficient meter reading, billing and collection

Timely meter reading, billing and collection can significantly improve the cash flows of the Board. The present systems need to be reviewed with a view to streamline the process and minimize the time between power supply and receipt of revenue. Supervisory officers must be given well-thought out programme to countercheck the meter readings taken by meter readers. The area of meter readers should be changed every year. New methods of meter reading through camera or palm-top computers, remote meter reading, reading through modem, etc. should also be explored. Wherever economical, L.T.-less system should be developed and aerial bunched cable and PVC cable should be used in theft-prone areas. Billing through MRI can be commenced for HT industrial and non-domestic consumers. Spot billing system can be introduced in the cities. Senior officers should be made responsible for analysis of MRIs. The bill format should be redesigned. Collection through drop boxes, banks, credit cards, e-payments can be immediately introduced. Call centres should be set up and the centres should be empowered to accept payments through cheques. Gram Panchayats, franchisees, etc. can be encouraged to come forward for taking collections of bills as also for other services.

A time bound programme for all the above should be made. Many of these issues including bill format, manner of billing etc. form part of the Supply Code which is being issued by the Commission. The Commission should be informed of various initiatives taken by the Board in this regard within three months.

11. Collection efficiency

With a view to improve collection efficiency, the Commission would like the CSEB to enter into arrangement with various banks for revenue collection. At locations where such arrangements are not possible, additional staff should be deployed for receiving payment of energy bills by making necessary arrangement therefor. Arrangement could also be made for collection of revenue by opening temporary counters at places of weekly markets in rural areas. The objective should be to ensure that there is least inconvenience to the consumers in regard to payment of electricity bills. The Commission expects the CSEB to plan and make necessary arrangements in this regard early. At the same time, a lot many innovations such as "anywhere payment" (i.e. to enable the consumer to pay his bill at any collection center of CSEB), payment through internet, payment at bank counters, payment through credit cards, etc., needs to be implemented by CSEB within one year.

The Board has indicated that the collection efficiency during 2004-05 was 90%. The Commission directs the Board to improve it to 92% during the year 2005-06 from the current demand and 15% be recovered from the arrears as on 31/03/05. (Para 5.5.4)

12. Arrears list

The Board should prepare age-wise list of consumers having huge arrears and this should be furnished to the Commission. A list has been received by the Commission which indicates that there are 4684 domestic consumers with arrears above Rs.10,000/- totalling to Rs. 5.36 Cr. Similarly, 739 non-domestic LT consumers are having arrears above Rs. 20,000/- with total arrears of Rs. 2.84 Cr. 555 LT industrial consumers are having arrears more than Rs.50,000/- with total arrears of Rs. 9.96 Cr. This indicates that field officers are not monitoring the arrear position and taking effective steps for disconnecting the defaulting consumers. This does not speak well of the Board and therefore, Board is directed to take prompt and effective action for recovery of arrears outstanding against both LT and HT consumers.

13. Arrears recovery

The low collection efficiency of the Board (presently only 90% including arrears) is mainly due to the huge out-standing on the Government Departments. There is no justification for treating the Government connections differently and the provisions of the Act must apply uniformly to all. The Commission, therefore, directs the Board to issue final notices of 90 days to all the Government departments with arrears of more than 3 months to pay off or face the disconnections. Supply must be disconnected after the expiry of the notice period. Similarly, notice should also be issued to the defaulter local bodies and efforts should be made to get recoveries from the State Government directly from Government grants to these bodies.

The Board shall also furnish the list of amount written off during the year 2004-05 & 2005-06 at the time of filing the next tariff petition.

14. Cost of supply and cross-subsidy

The Commission as per clause (g) of Section 61 of the Act is to ensure that the tariffs progressively reflect the cost supply and cross-subsidy is to be reduced and eliminated within the period to be specified by the Commission. The Commission directs the Board to carry out a study, with the assistance of a suitable consultant, if necessary, so that voltage-wise and consumer category-wise cost of supply is ascertained. This is necessary for the purpose of better tariff design as also to find out the nature and extent of cross-subsidy. (Para 5.7 and 5.8)

15. Consumer care

It is common knowledge that consumers have to wait for long hours in long queues for payment of electricity bills, corrections in the bills, etc. There is lack of basic amenities at collection centres and distribution centres.

The Board should provide the minimum basic facilities like shed, sitting area with chairs, drinking water, fan, toilet etc. at collection centers.

Collection of bills through token system can also be considered at a few places, where the arrangements to display the token numbers may be made. A common design of a model collection centre may be developed by the Board and may be shown to the Commission before implementation. At-least 50 such waiting areas shall be developed during the financial year 2005-06.

16. Consumers grievance redressal

There is an urgent need to build up the system for customer care. In spite of repeated advice, the CSEB has not so far instituted an Internal Grievance Redressal Mechanism and has not set up the Consumers' Forums at Raipur, Bilaspur and Jagdalpur in the first phase. Call centres to register and monitor consumers' complaints could not be set up so far while these are successfully functioning in many states.

The CSEB is advised to study the practices and initiatives undertaken in other states and plan implementation of similar systems in Chhattisgarh.

17. Power purchase and procurement

The CSEB makes short-term power purchases from sources other than NTPC, such as Power Trading Corporation, NTPC Vidyut Vyapar Nigam Ltd., etc. In accordance with provisions of the Electricity Act, 2003, the Commission's approval is necessary. It is thus a legal requirement that all short-term as well as long-term purchases are approved by the Commission. The Board should ensure that there is no default in seeking approval of the Commission, failing which the Commission will be constrained to disallow the expenditure incurred on the same.

CSEB is directed to ensure that no purchase of power be made at overall purchase rate of higher than Rs. 3.30 per unit (Para 5.5.9)

Further, it has been observed that Board has been paying huge amounts towards U.I. charges. Overdrawal of power from the Central sector should be avoided, as far as possible, during the period when the frequency is 49.5 Hz or below. The Board should strictly follow the merit order prepared by the Commission in power purchase. (Para 5.5.9)

18. Asset registers

Asset registers must be maintained properly and completed within six months by assigning specific responsibilities to the concerned officers.

19. Financial Management

The financial management of the Board also needs revamping. There is presently only accounts keeping at the Circle level and not the financial management as such. Even in the generating stations there is no financial management. Lack of trained and competent manpower is said to be the reason. The Board should relax, if need be, its present recruitment procedures to provide for lateral entry of Chartered

Accountants and Cost Accountants at middle levels recruited from the open market. A Finance Cell for Korba (East) and Korba (West) under a Cost Accountant must be created as early as possible.

20. Cadre management

Paucity of manpower combined with poor cadre management has resulted in a crisis in higher echelons of management in the Board. The Board has to address this issue on priority. It should evolve a procedure for building up its officers cadres, particularly at the level of the senior management, so that in case of retirement of a senior officer, say a Chief Engineer, the person next to him i.e. Addl. Chief Engineer is in a position to take over his charge. Such an arrangement ensures that there is no disruption of work in the event of retirement or transfer of a senior officer. To achieve this, it will be necessary that no sanctioned post is kept vacant in the cadres of Chief Engineer, Addl. Chief Engineer and Superintending Engineer so that in case of retirement of any senior officer in these cadres the post is immediately filled up. This should be made applicable in the Finance and Accounts Section also. Timely recruitment and promotion will go a long way in better management of the officers' and employees' cadres.

The number of employees per MW of a installed capacity is 4.18, which is very high. The Board should make efforts to reduce the staff to at least 3 per MW and redeploy the surplus staff elsewhere. [Para 5.3.5(a)]

21. Training to personnel

The Board should prepare plans, both short-term and long-term, for rationalization of existing manpower for improvement in electricity through significant engineering resource management, improving and updating the organization strategies, systems and skills of human resources for increased productivity/service. HRD is one area which needs focussed attention. The functioning of the in-house training institutes should be looked into and the technical, financial and management training facilities available outside should be used for proper training of personnel, which seem to be grossly inadequate at present.

22. Improving operational efficiency by competition

The Board should introduce competition among the various circles in the generation, transmission and distribution departments. The Commission believes that competitions among the various circles will be the first step in improving operational efficiency.

23. In-house Management Consultancy Cell

The CSEB should have an in-house Management Consultancy Cell (IMCC) headed by a full time Chief Engineer or a retired Chief Engineer. The cell should have officers drawn from O&M, testing, and commercial etc. having aptitude for research work. These officers could be sent for

management training to reputed institutions in the country and should have stability of tenure of at-least 3 years.

24. Procurement and inventory management

Inordinate delays in procurement of essential material is known to have often delayed the programmes of expansion of T&D network as also timely maintenance of generation units and existing T&D network. The Board has to focus on its purchase procedure and overhaul it. Material management policy and practices, including the various functions involved in procurement, such as approval of purchases, tender approval, placement of purchase orders, delivery schedules and payment etc. need to be streamlined so as to ensure that necessary inputs of right quality is provided at the right time and the Board's operations are maintained at optimum efficiency. Improvement of the tendering process through the help of IT (e.g. e-tendering) and decentralization of procurement procedure will go a long way in improving material management.

Inventory management and control is another important area which needs adequate attention. Improvement in inventory management will significantly reduce costs. The Board should take the help of IT and institute a proper and adequate inventory management system. This should be initiated and completed during the year.

25. APDRP

Although not directly related to the operations of the Board, the Commission would like to mention about the implementation of the APDRP scheme of GoI under which financial assistance is available from GoI to the extent of 50%. for projects for system upgradation and strengthening including sub-transmission and distribution network, energy accounting, and metering. The Board will be well advised to take advantage of this important programme to upgrade its systems and network. The Board should go into the manner in which the scheme is being implemented today and may perhaps adopt a more decentralized approach for formulation of schemes to take full advantage. Regular monitoring of implementation of the programme is also called for.

26. Improved governance

Finally, the Commission feels that while it is important to focus on PUF improvements, cost reduction, loss minimization and efficiency improvement measures, the need for attending to the morale of the employee through improved governance, is perhaps of greater and immediate importance to ensure that the employees are motivated to make valuable contribution to operational efficiency. The conditions of the utilities currently functioning with insufficient resources can be improved significantly only by better corporate governance, which motivates change in work culture and performance of employees through proper communication and implementation of effective and sustainable management practices. Reforms would not be successful if dealt with in

isolation and without good corporate governance. The Commission is confident that such an environment geared to improving the standards of performance and delivering the highest quality of service would restore the confidence of the consumers who would then readily respond and support the utility's efforts.

27. Investment programme

It is observed that the Board has not submitted their investment programme for the next five years. Further, the details of capital works in progress furnished to the Commission are incomplete. The CSEB is directed to submit their investment programme for the next five years within the next three months. A quarterly progress report on major capital works should also be regularly furnished to the Commission.

28. Audit of accounts

The audited accounts of Board have not been made available to the Commission since inception. Hence, verification of the figures furnished in the tariff petition has not been possible. The CSEB must take steps to get its accounts audited for all the years since inception by CAG before March 2006. (Para - 2.5).

29. New generation projects

The projected high power purchase is due to lack of investment in new generation projects during the last four years. During 2004-05 CSEB has started new (2X250 MW) generation project in Korba East which is scheduled to commissioned in March 2007. CSEB is directed to expedite the process for setting up another new generation project in 2005-06 and submit quarterly progress report on the generation expansion projects to the Commission.

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No. 178/CSERC/ 2005

Raipur, Dated 12/05/2005

To;

The Secretary
Chhattisgarh State Electricity Board
Danganiya,
Raipur - 492 013

Sub- HT Energy Audit for Curbing Revenue Loss.

According to ARR and Tariff Petition filed by CSEB for the FY 2005-06, the T&D losses have increased from 34.14% during FY 2003-04 to 38.96% during FY 2004-05 showing upward trend.

2. The need for reducing excessive transmission and distribution (T&D) losses is one of the key requirements for restoring financial viability of the power utilities. It is essential to give higher priority to measures that can lead to increase in revenue within a short time, with limited investment, and with limited managerial efforts.

3. The first step in the efforts at reducing excessive T&D losses is to properly estimate T&D losses. CSEB has indicated that a study to ascertain its correct loss levels at different voltage levels will be conducted soon. The next and probably more important step in these efforts is to identify various links or geographical areas in the network that have excessive losses. As per the data made available by the CSEB, Raigarh O&M Circle reports losses as high as 56.25% and tops the list followed by Bilaspur with 47.88%, Janjgir with 41.89%, Raipur O&M Circle with 38.96% and Ambikapur with 37.25%. When compared with the total loss in the State, in terms of quantum of power. Raipur O&M Circle tops with 19.95%, followed by Durg with 16.43%, Bilaspur with 13.29%, Raigarh with 12.82% and Janjgir with 11.47%. It is possible that losses in some of these areas or links could be easier to control as compared to losses in other links/areas. Identification of such links/areas makes it possible to first direct all

efforts for reduction in T&D losses on these areas or links for the maximum benefit.

4. Measurement or even estimation of T&D loss in the LT system is a difficult task, as the LT network connects thousands and lacs of small consumers spread across the State and are there even in remote and inaccessible areas. However, unlike the LT system, the transmission or high-tension network connects only to a few hundred large consumers. Hence, it is much easier to monitor the HT network. The position in this State is such that more than 70% energy flows in EHT & HT system (40% in EHT and 30% in HT). Making correct measurement (or at least estimation) of losses in the HT system would be easier and less prone to large variations

5. Losses at HT-level includes substantial commercial losses and the revenue lost per consumer as well as of the total revenue loss may be quite significant. It needs to be viewed in combination with the facts, that in the State of Chhattisgarh, (i) HT and EHT consumption is to the tune of 70% of total sales, and (ii) HT and EHT sales account for over 78% of the total revenue. If we take into consideration these facts, it is clear that even a small commercial loss in the HT-section has significant impact on the revenues of the CSEB. **With the HT tariff being one and half times that of the LT tariff and the number of HT consumers being 0.03% of the LT consumers, it is obvious that the first point of attack has to be the HT section.**

6. Accurate measurement of energy transformed to LT could be done only by metering of the distribution transformers which is of the order of around 40 thousand in the State. No doubt this approach would be far more effective in localizing high theft points. But its implementation - in terms of installation of meters, proper maintenance, reading, and data analysis in a routine and consistent manner - could take substantial time. **Hence, as an intermediate option audit could be restricted up to 33kV level (i.e. instead of measuring energy transformed to 440V, energy transformed to 11 kV should be considered)** Since, energy fed into all the 11kV feeders is now measured or expected to be measured soon, calculating such an energy balance up to 33kV

should not pose any problem. It only involves maintenance and reading of all meters on the 11kV feeders in the substations.

7. As a last resort, installation of a check meter for each HT consumer on mixed feeders could be considered. Investment required for such additional metering for 632 HT consumers in the State may involve one time expenditure of Rs.3.00 crore which is hardly 0.1%, of the CSEB's annual revenues. Such check meters can help identify the problematic consumers/areas. In cases where difference in check meter and consumer meter readings falls outside the range +/- 1% or either of the meter reading is unavailable, appropriate billing could be done instead of billing an average consumption basis.

8. The approaches of "100% metering" and "total energy audit" are essential for achieving our objective of improving the financial status of the Board and establishing accountability up to the level of linesmen of the utility. In the tariff petition for the FY 2005-06, it has been indicated that CSEB has launched compulsory energy audit at all voltage levels. The energy audit is to cover all the 31O&M Divisions and contain metering on all the 33 and 11 kV input points.

9. In the light the above, CSEB needs to take following actions without delay:-

(1) Considering that EHT and HT consumers constitute 70% of the total consumption, the first priority in the efforts towards T&D loss reduction should be to establish an effective metering and audit regime at the HT level to curb revenue loss. Efforts of reducing commercial losses at the HT level can take different forms; starting from proper vigilance and inspection by CSEB staff to instituting a rigorous energy audit to identify losses in various feeders. But, depending simply on administrative measures such as vigilance squads will prove to be ineffective in the present setup of CSEB. More direct measures, which could hold the staff accountable, need to be adopted. Rigorous energy audit is one such measure. Such an audit should aim at establishing the energy balance right from the point of generation and point of power purchase to points where energy is sold. The audit system should be capable of (i) detecting

malpractices on a routine and consistent basis; and (ii) being implemented in a time bound manner.

(2) To begin with energy audit of HT consumers of Raipur (O&M) and Durg Circles should be got conducted refutably through an outside agency most urgently. Such an audit is likely to reveal the extent of commercial losses in HT consumption since these two circles alone account for losses to the tune of 36.38% of the total losses of the Board. The process must start now, as the audit is likely to take time and must be completed before Board files the next ARR and tariff petition in November, 2005.

(3) Provision of meters on 33 kV and 11 kV feeders - While all the EHT feeders have been provided with meters, 354 33 kV feeders/points, out of a total of 910 feeders/points are yet to be provided with meters. Similarly, out of 1737, 11 kV feeders/points, 626 feeders/points are yet to be provided with meters. CSEB has planed to provide meters on all the 33 kV and 11 kV feeders by December 2005. Immediate steps shall be taken to procure and provide meters on the remaining feeders so that measurement of energy transformed to 11 kV could be started.

(4) Entire portion of 11kV or 33kV feeder in the premises of the HT consumer shall be replaced by Aerial Bunched cable or XLP/Armoured cable. This will avoid direct taping from the line by passing the meter.

(5) Selected or doubtful consumers shall be provided with modem so that meter reading could be recorded on line at the CSEB end. With this arrangement the consumption of the consumer could be properly monitored.

(6) Improved design of HT metering equipment in the form of cubicle shall be used with Armoured cable so that there may not be any possibility of interference with the meter and metering equipment.

(7) Group of HT consumers getting supply from common feeder emanating from 33 kV substation shall be provided check meters at the substation and the

consumption recorded by this meter tallied with the consumption recorded by the individual HT consumers every month.

(8) Estimation of technical losses at the HT level shall be correctly done through load-flow studies by outsourcing if required equipments and talent are not available in the CSEB. This should be undertaken more urgently.

(9) There is an urgent need to assess the consumption pattern in the agricultural sector in the State. The Commission has already asked the Board for taking up sample studies in areas of high agricultural consumption/high intensity of agricultural pumps. These areas can easily be identified by the Board. Such sample studies should be undertaken at least in three districts in the State. To start with common meter for group of agriculture consumers be installed at various places so as to see consumption pattern in different crop seasons.

(10) More vigilance squads shall be created and effective checking should be got done, holding the staff accountable for the lapses.

10. The Commission considers above issues extremely important and as desired the CSEB should prepare an action plan covering all these points which should reflect the time schedule already specified for certain activities above. The Commission has already approved the action plan for installation of meters separately. The action plan covering all the action points of para 9 shall be submitted by the CSEB within a month. However, the studies to be undertaken as per para 9(2), (8), (9) and need not wait for preparation of action plan.

Sd/-
Deputy Secretary