CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Coram

Shri K.N. Sinha, Member

Petition No 66/2005

In the matter of

Approval of tariff in respect of Damodar Valley Corporation for the period from 1.4.2004 to 31.3.2009.

And in the matter of

Damodar Valley Corporation **…Petitioner**

Vs

1. Department of Energy, Govt. of West Bengal, Kolkata
2. Department of Energy, Govt. of Jharkhand, Ranchi
3. West Bengal State Electricity Board, Kolkata
4. Jharkhand State Electricity Board, Ranchi
5. Ministry of Power, New Delhi **….. Respondents**

The following were present:

1. Shri S.N. Choudhuri, CE, DVC
2. Shri A. Biswas, DVC
3. Shri A.K. Ghosh, DVC
4. Shri Taruna Singh Boghal, DVC
5. Shri A.K. Mukherjee, SE(T), DVC
6. Shri T.K. Gupta, DVC
7. Shri Arulraj Solomon, DVC
8. Shri G. Ramachandran, DVC
9. Shri A. Biswas, DVC
10. Shri M. Dhar, DVC
11. Shri P. Roy, DVC
12. Shri S.B. Srivastava, DVC
13. Shri G. Mukherjee, DVC
14. Ms. Saumya Sharma, DVC.
15. Shri Sitesh Mukherjee, Advocate, JSEB
16. Shri K.P. Ray, Bhaskar Shrachi Alloys Ltd.
17. Shri Gautam Shroff, Bhaskar Shrachi Alloys Ltd.
18. Shri Debnath Ghosh, Bhaskar Shrachi Alloys Ltd.
19. Shri M. Prahladka, Bhaskar Shrachi Alloys Ltd.
20. Shri Shyamal Sarkar, Advocate, Maithon Alloys

ORDER
(DATE OF HEARING : 13.2.2006)

This petition has been filed by the petitioner, Damodar Valley Corporation (hereinafter referred to as “DVC”) under sections 61, 62 and 86 of the Electricity Act, 2003 (hereinafter referred to as “the Act”) for approval of the revenue requirements and for determining the matters concerning the tariff for electricity activities undertaken by it for the period from 1.4.2004 to 31.3.2009.

2. DVC is a statutory body established under the Damodar Valley Corporation Act, 1948 (hereinafter referred to as the 'DVC Act') and has been promoted by the Central Government in consultation with the provincial Governments, namely, Government of West Bengal and the Government of Bihar. After the re-organisation of the State of Bihar, the Government of Bihar has been substituted by the Government of Jharkhand. The representatives of the Governments of Jharkhand and West Bengal are on the Board of DVC.

3. In terms of provision of the DVC Act, the three participating Governments had contributed a sum of Rs. 214.72 crore up to the year 1968-69. Thereafter, DVC has ploughed back the surplus revenues earned by it from its operation in stead of distributing the same to the participating Governments.

4. Section 12 of the DVC Act provides for the following functions of DVC :

(a) Promotion and operation of schemes for irrigation, water supply and drainage,

(b) Promotion and operation of schemes for the generation, transmission and distribution of electrical energy, both hydroelectric and thermal.

(c) Promotion and operation of schemes for flood control in the Damodar river and its tributaries and the channels, if any, excavated by the Corporation in connection with the scheme and for the improvement of flow conditions in the Hooghly river,

(d) Promotion and control of navigation in the Damodar river and its tributaries and channels, if any,

(e) Promotion of afforestation and control of soil erosion in the Damodar Valley, and

(f) Promotion of public health and the agricultural, industrial, economic and general well-being in the Damodar Valley and its area of operation".

5. DVC has thus multifarious functions in the Damodar Valley, which extends to the States of West Bengal and Jharkhand. The activities of DVC are not restricted to generation and sale/supply of electricity., but include promotion and operation of schemes for irrigation, water supply and drainage, flood control and improvement of flow conditions in the Hooghly river, navigation in the Damodar river and its tributaries and channels, afforestation and control of soil erosion in the Damodar Valley and promotion of public health and agricultural, industrial, economic and general well being in the Damodar Valley under its areas of operation.

6. From the preceding para, it may be seen that many of the activities in which DVC is engaged are not commercial in nature generating revenue from the users of services such as drainage, flood control, improvement in the flow conditions, navigation, afforestation and control of soil erosion or the promotion of public health. The main revenue earning activity of DVC is generation and sale of power.

7. Accordingly, DVC has prayed to be allowed:

(i) Revenue requirement based on actual cost along with recovery of return and interest of the order of Rs.250/KVA/month, and

(ii) A transition period of 4 to 5 years to be put on normative regime.

8. The terms and conditions for determination of tariff for the period from 1.4.2004 to 31.3.2009 are notified in terms of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations 2004 (hereinafter referred to as "the 2004 regulations"). Prior to coming into force of the Act 2003, the tariff for generation and supply of electricity was determined by DVC Board under the DVC Act. Since tariff determination involved a number of complicated issues, the Commission by its order dated 18.10.2005 constituted a one-Member Bench with me as the Presiding Member to examine various tariff-related issues and make appropriate recommendations to the Commission for its consideration and decision. I am in ceased of the matter in the above context.

Principles and Methodology adopted by DVC in earlier tariff settings

9. Prior to 1.4.2004, DVC was charging one integrated tariff for generation, transmission and distribution of electricity. The integrated tariff consisted of the following two components, namely:

(a) **Fixed Cost**: This comprised 75% of O&M cost, establishment cost, depreciation, and interest on capital, interest withheld and sinking fund, etc.

(b) **Variable Cost**: This comprised 25% of O&M cost, fuel cost, power purchases, income tax and net return.

10. The return on capital employed concept was adopted instead of return on equity concept. Net returns were computed on the total capital and resources deployed up to the last year at a specified rate less income from other sources (9% for tariff setting for 1999-2000 and 10% for 2000-01).

11. The integrated tariff (Rs.235 paise/kWh for 1999-00 and Rs.250 paise/kWh for 2000-01) was distributed into two components for recovery from the consumers:

		1999-00	2000-01
(i)	Energy charge (paisa/kWh)	150.00	163.00
(ii)	Demand charge (Rs./kW/month)	347.00	365.00

12. In addition, the consumers were charged fuel cost surcharge/rebate, final demand charges and power factor surcharges/rebate.

13. Common O&M expenses including expenses incurred on statutory functions were distributed amongst major objects of power, irrigation and flood control in proportion to their capital cost. The operating cost in irrigation and flood control were borne by respective participating State but in the absence of any direct capital contribution by them, these were met from revenue surplus generated from power functions.

Details of investment in different functional areas

14. Based on information and clarifications submitted by DVC in the affidavit dated 25.7.2005 the following position emerges as regards capital investment as on 31.3.2004 in different functional heads:

(Rs. in crore)

Sl. No.	Description	Power				Irrigation	Flood Control	Total
		Thermal	Hydro	Transmission & Distribution	Total Power			
1	Direction Offices*	3.71	0.10	0.75	4.56			4.56
2	Other offices	3.94	0.12	0.80	4.86			4.86
3	Thermal Generating Stations							
	BTPS	631.92			631.92			631.92
	CTPS	339.45			339.45			339.45
	DTPS	201.79			201.79			201.79
	Mejia TPS	1575.66			1575.66			1575.66
	Maithon GT	48.90			48.90			48.90
	Total Thermal	2797.72			2797.72			2797.72
4	Hydro Generating Station							
	Tilaiya		1.26		1.26			1.26
	Maithon		39.35		39.35			39.35
	Panchet		40.67		40.67			40.67
	Total Hydro		81.28		81.28			81.28
5	Transmission & Distribution			564.40	564.40			564.40
6	Subsidiary Activity	26.19	0.76	5.29	32.24	1.84	0.61	34.69
7	Multi-purpose Dams		22.79		22.79	22.79	23.63	69.21
8	Central offices	26.70	0.78	5.39	32.85	1.82	0.09	34.76
9	Flood Control						0.03	0.03
10	Irrigation					100.93		100.93
11	Mining & Rope way	2.94			2.94			2.94
12	**Total**	**2861.20**	**105.08**	**576.63**	**3543.65**	**127.38**	**24.36**	**3695.39**

Principles and Methodology to be adopted

15. It noted that the petitioner has indicated total capital investment of Rs.3695.39 crore as on 31.3.2004 in 3 functional heads namely, Power, Irrigation and Flood Control. I am concerned with capital investment in Power which is indicated as Rs.3543.65 crore as on 31.3.2004 conforming to books of accounts of DVC for the year 2003-04.

16. The Commission in its order dated 29.3.2005 in petition No.168/2004 (*suo motu*) has already taken a view that it would not go into distribution tariff. Hence, I confine my deliberations to determination of tariff for the generation, both thermal and hydro, and transmission activities of DVC.

17. The 2004 regulations provide for determination of generation tariff station-wise and transmission tariff line/substation-wise. The petition filed by DVC also claims tariff of the following stations for the generation capacity of 3014 MW (2870 MW Thermal and 144 MW Hydro) and transmission tariff for 220 KV & 132 KV transmission lines & sub-stations and associated bays:

Sl. No.	Generating Stations	Capacity (MW)	De-rated Capacity (MW)
A.	**Thermal Generating Stations**		
(1)	Bokaro TPS (A & B)	877.50	805.00
(2)	Chandrapur TPS	780.00	750.00
(3)	Durgapur TPS	500.00	350.00
(4)	Mejia TPS	630.00	630.00
(5)	Maithon GPS	82.50	82.50
	Total Thermal	**2870.00**	**2617.50**
B.	**Hydro Generating Stations**		
(1)	Panchet	80.00	80.00
(2)	Maithan	60.00	60.00
(3)	Tilaiya	4.00	4.00
	Total Hydro	**144.00**	**144.00**
	Total Thermal & Hydro	**3014.00**	**2761.50**

18. The tariff related issues deliberated are as follows:

(a) Whether to follow NFA approach or GFA approach,

(b) Capital cost to be considered for the purpose of tariff,

(c) Debt:-equity ratio,

(d) Interest on Loan,

(e) O&M expenses,

(f) Depreciation,

(g) Interest on Working Capital, and

(h) Operational norms for thermal and hydro generating stations, as also the transmission system.

Whether to follow NFA approach or the GFA approach

19. As per the methodology adopted by DVC so far for tariff fixation, returns were computed on the total capital and resources deployed. This is slightly different from GFA concept adopted by the Commission in the 2004 regulations where returns are computed on the equity component corresponding to gross fixed assets found admissible by the Commission. For the sake of uniformity, I recommend that the Commission may follow return on equity approach on GFA concept in line with the 2004 regulations based on the reasonable debt: equity mix.

Capital cost for the purpose of tariff

20. DVC has claimed tariff on the capital cost which includes apportioned capital cost of the centralized offices and subsidiary activities in the field of generation, transmission and distribution of electricity. The power system maintained by DVC consists of Generating Stations with total de-rated installed capacity of 2761.50 MW

which includes 2535 MW of Thermal, 144 MW of Hydro, 82.5 MW of gas. Besides, DVC has Transmission and distribution systems also. Project-wise capital cost in respect of each line and sub-station is not precisely ascertainable. The total capital investment as on 31.03.2004 under the T&D head including the share allocation of Direction and other offices and subsidiary activities has been taken as base and allocated to each project . The salient features of various power stations of DVC and transmission and distribution systems are as tabulated below:

Name of the Stations/ systems	Installed Capacity (in MW)	COD of the Station/ system	Project Cost as on COD (Rs. in crore)
Bokaro TPS	805	August 1993	645.59
Chandrapur TPS	750	March 1979	346.79
Durgapur TPS	350	September 1982	206.15
Mejia TPS	630	September 1999	1609.75
Maithon GPS	82.5	October 1989	49.96
Maithon Hydel	60	December 1958	53.49
Panchet Hydel	80	March 1991	49.79
Tilaiya Hydel	4	August 1953	2.56
Transmission system	220/132 KV line	Existing as on 31.3.2004	501.68
Distribution system		Existing as on 31.3.2004	74.96
Total			3540.72

21. The above capital cost also includes the cost of non-performing units also. DVC has indicated the capital cost of non-performing units as given hereunder:

(Rs. in crore)

	Bokaro TPS A & B	Chandra-pur TPS	Durgapur TPS	Maithon GPS	Total
Capital cost of the capacity not-in-use	80.14	102.87	14.94	48.90	246.85

22. While considering the question of capital cost for each of the generating station and transmission system of DVC, I am first considering the following issues which are associated with the question:

(i) Starting point for computation of the capital cost for the purpose of tariff, that is, whether to be guided by books of accounts or to trace it from the date of commercial operation of the respective generating station and the transmission system;

(ii) Treatment of investment in the Director Offices, Central offices, other offices, and subsidiary activities; and

(iii) Treatment for the capacity or the asset not in use.

23. These issues are discussed below:

Starting point for the capital cost for the purpose of tariff

24. The generating stations of DVC except Mejia TPS are quite old and, almost all of them have outlived their rated useful life or are completing their rated useful life. Therefore, it is difficult, if not impossible to trace the capital cost from the date of commercial operation of the each unit/stage/station. DVC was asked to submit the approvals of the competent authority regarding the cost, etc. It has, however, not been able to produce such approval for the old generating stations like Bokaro, Chandrapura, Durgapur etc. In view of this, I have considered it appropriate to be guided by the books of accounts, duly audited by the statutory auditors. The issue was deliberated during the hearing and the beneficiaries had no objection to this

approach. I, therefore, recommend that the capital cost for the purpose of tariff should be the cost as per the books of accounts for the year 2003-04.

25. The capital cost of transmission and distribution systems is not available separately in the books of accounts. DVC has submitted that a precise separation of transmission and distribution system is not possible. However, for the purpose of tariff capital cost of transmission system and distribution system has been considered in the ratio of 87:13. For this purpose, 220/132 kV sub-stations, power transformers and associated lines have been considered as part of transmission system whereas similar infrastructure at 33kV has been treated as part of distribution system. The Commission observed that line length in Transmission System (220 kV & 132 kV) is 4538 ckt kms against 1056 ckt kms in distribution system (33 kV). In view of around 23% line length of distribution system compared to transmission system and cost of distribution system is generally less than transmission system, the bifurcation of capital cost between transmission and distribution systems in the ratio of 87:13 ratio has been accepted by the Commission for the purpose of tariff.

Treatment of capital investment on Directors Offices, Central offices, other offices and subsidiary activities

26. The capital cost based on which tariff has been claimed includes apportioned cost of Directors Offices, Central offices, other offices and subsidiary activities. In compliance with direction, the petitioner has furnished the details pertaining to nature of functions of these offices and subsidiary activities. These are discussed in the succeeding paras.

Directors' Offices

27. The Directors' Offices include the office of the Director (Generation), Director (System) and Director (Commercial) at Kolkata, and Office of the Senior Chief Engineer (Generation) and Senior Chief Engineer (System) at Maithon. Director (Generation) is the technical head of all generation related activities and is directly answerable to the Corporation. Senior Chief Engineer (Generation) at Maithon is the administrative head of all the generating stations and Central Services Organization & Mechanical Fabrication Shop at Maithon directly connected with the O&M of the power houses and is responsible to Director (Technical). Director (System) is the technical head of all system related activities and is directly answerable to the Corporation. Senior Chief Engineer (System) at Maithon is the administrative head of the transmission and distribution systems as well as Central Testing Circle etc. and is directly answerable to Director (System). Director (Commercial) is the head of Commercial Department at Kolkata and Central Load Dispatch at Maithon and is directly answerable to the Corporation in all System Control and Commercial related matters.

Central Offices

28. These include Central administration office, Central Stores and Disposal Wing under the control of the project head of Maithon.

Other Offices

29. The other offices include Central Testing Circle, Maithon, Central Mechanical Fabrication Shop, Maithon, Central Services Organization, Maithon and Central Load Dispatch, Maithon. The Central Testing Circle at Maithon has two distinct divisions namely Central Relay and Instrument Testing Laboratory (CRITL) and Central Relay

and Instrument Testing Mobile (CRITM). These two divisions take care of commissioning and proper maintenance of the entire protection and metering system, fault analysis as well as periodical testing of all types of relays and meters including tariff meters of the entire DVC network including power houses. The Central Mechanical Fabrication Shop at Maithon mainly takes care of different types of mechanical maintenance work including casting and fabrication of typical parts for power houses and also for the transmission wing. The Central Services Organization at Maithon takes care of varied types of electrical maintenance work such as over-hauling and rewinding of large motors, transformers etc. both for power houses and transmission & distribution network. The Central Load Despatch at Maithon is engaged in system control and its functions are similar to that of a State Load Despatch Centre (SLDC) for the entire DVC system in conjunction with Eastern Regional Load Dispatch Centre (ERLDC).

Subsidiary activities

30. These include afforestation, soil conservation, use of land, agriculture development, industrial development, experiment & research station, public health & sanitation, navigation etc. DVC vide its affidavit dated 8.3.2006 has submitted that soil conservation activities leading to prolongation of life of water reservoir benefits both thermal and hydro generating stations because these generating stations get water from these reservoirs and hence are directly linked to the power generation.

31. From the nature of functions of the Directors Offices, the other offices and Central offices it is clear that these are centralized offices and catering to the needs of all the generating stations and transmission and distribution system and their cost,

therefore, cannot be allocated to the individual generating station or the transmission system and should get the similar treatment as given to investment on Corporate Centres and the regional offices in case of NTPC, NHPC and PGCIL. Therefore, cost of servicing of capital investment on these offices should be booked to O&M expenses duly apportioned to different generating stations and transmission and distribution system. As such, the capital cost associated with these offices has not been considered in the capital cost of generating stations or the transmission system for the purpose of tariff.

32. As regards subsidiary activities, except the soil conservation, all other activities are unrelated to generation of power and hence investment on these activities also cannot be considered in the capital cost of generating stations or the transmission system. The soil conservation activity, though related to power generation is being performed centrally and hence as discussed in case of Directors offices, other offices & Central offices, investment on these activities should also be serviced through O&M and should not be considered in the capital cost of generating stations or the transmission system.

33. In view of above, allocated cost of Direction office, other offices, central offices and subsidiary activities has been excluded from the capital cost claimed by DVC for the generating stations and the transmission system for the purpose of tariff.

Treatment of assets/capacity not in use

34. It has been noticed that the certain installed capacity in the thermal generating stations namely Bokaro 'A', two units of 75 MW in Durgapur TPS, 3 units of 120 MW

in Chandrapura TPS and Maithan GPS (82.5 MW) are not operating. As such, this much capacity is not used and contemplated for an extensive renovation & modernization. There are two options for treatment for such capacity not in use:

(i) Allow tariff on total capital investment including capital investment on these non-performing assets, or

(ii) Allow tariff on the capital investment after excluding capital investment on these non-performing assets.

35. In the option (i) above, DVC would get reduced fixed charges on prorated basis because of non-availability of certain capacity. But the problem is with regard to operational norms of station heat rate, specific fuel oil consumption, auxiliary energy consumption, target availability etc for the capacity not in use. The capacity which is not in use is consisting of small capacity units which have outlived their rated life or are marred by designed deficiencies. These are contemplating extensive R&M and hence past performance is not of any relevance.

36. I recommend option (ii) with the liberty to DVC to approach the Commission for the tariff approval based on the cost of R&M supported by cost benefit analyses of R&M and sustainable operation parameter with due justification when the capacity is put to use again. Therefore, the associated cost for the capacity not in use has been deducted from the capital cost claimed for the purpose of tariff. The capital cost as recommended by me for the purposes of determination of tariff is indicated below :

(Rs.in crore)

Name of the Station/ system	
Bokaro TPS	551.78
Chandrapur TPS	236.58
Durgapur TPS	186.85
Mejia TPS	1575.67
Maithon GPS	0
Maithon Hydel	52.64
Panchet Hydel	48.91
Tilaiya Hydel	2.53
Transmission system	491.05
Total	3146.01

Debt-equity ratio

37. DVC has proposed to fix tariff after taking into account the debt-equity ratio of 15:85 . It has been stated that in respect of majority of DVC's assets, the market borrowings to the extent availed in the past years have since been mostly repaid. However, these assets which have either fully completed their technical project life or are on the verge of completion, are continuing to generate power with periodical additional capital expenditure required for maintaining their health and being considered for R&M after RLA Study during 10th Five-Year Plan. Because of this fact, depreciation reserves have been mostly invested in continuous Life Extension and Improvement (E&I) of these old vintage assets over the past years. It is also stated that since DVC is operating for about six decades, it is not possible to ascertain the project-wise debt-equity structure on the date of commercial operation. However, the projects of DVC have not been structured with a definite percentage of debt:-equity ratio. The capital contributed by the participating Governments to meet the capital cost of the project has been treated as DVC's own resources. Hence, the actual capital structure existing as on March, 2004, has been taken as the basis for arriving at the equity capital in the project cost.

38. The Commission has decided to adopt the approach for the purpose of calculation of tariff under which equity will not be diminished and will earn return till the end of the life of the asset. Under these circumstances allowing 85% equity will not be prudent and will prove to be detrimental to the interest of the consumers. Moreover, DVC could not able to produce any approved financing plan for any of the projects under consideration. While scrutinizing the annual accounts of the DVC it is found that: its Gross Fixed Assets as on 31.3.2004 were worth Rs. 3543.65 crore. Equity as per the annual accounts of the DVC as on 31.3.2004 is of Rs. 1105.40 crore as shown hereunder:

Capital Account of	**(Rs. in crore)**
Central Govt.	397.90
West Bengal Govt.	324.62
Bihar (Jharkhand) Govt.	382.88
Total	**1105.40**

39. From the above it is found that equity deployment as on 31.3.2004 is about 31.20% of the total capital deployed by DVC. Accordingly, I recommend the debt-equity ratio of 70:30 in line with the 2004 regulations, as amended on 3.9.2004 for computation of tariff for the tariff period 2004-09.

Interest on Loan,

40. Majority of the loans raised DVC are not project-specific. The normative station-wise loan outstanding, as on March 2004, may be computed by applying the normative debt-equity structure of 70:30 to the total capital cost recommended by me above with weighted average rate of interest of the loan for DVC as a whole.

O&M expenses,

41. DVC has claimed the following O&M expenses for the tariff period:

(Rs. in crore)

Sl. No.	Name of Station	2004-05	2005-06	2006-07	2007-08	2008-09
A	**Thermal Stations**					
1	Bokaro TPS	155.54	161.76	168.23	174.96	181.96
2	Chandrapur TPS	168.26	174.99	181.99	189.27	196.84
3	Durgapur TPS	128.43	133.57	138.91	144.47	150.25
4	Mejia TPS	106.30	110.55	114.98	119.58	124.36
5	Maithon GPS	9.73	10.12	10.53	10.95	11.38
	Total Thermal	**568.26**	**590.99**	**614.64**	**639.23**	**664.79**
B	**Hydro Stations**					
6	Maithan Hydel	14.93	15.53	16.15	16.80	17.47
7	Panchet Hydel	11.09	11.53	11.99	12.47	12.97
8	Talaiya Hydel	3.07	3.19	3.32	3.45	3.59
	Total Hydel	**29.09**	**30.25**	**31.46**	**32.72**	**34.03**
C	**Transmission**	**42.36**	**44.05**	**45.82**	**47.65**	**49.55**
D	**Distribution**	**6.33**	**6.58**	**6.85**	**7.12**	**7.40**
	Total O&M Claimed	**646.04**	**671.87**	**698.77**	**726.72**	**755.77**

42. The above O&M expenses claimed are based on actual for the period 1998-99 to 2002-03 and include proportionate expenses of Directors' Offices, share of general overheads, share of operating expenses of fuel (for thermal) and subsidiary activities.

43. It can be seen that in case of generating stations of DVC, there is no similarity in O&M expenses/MW between one generating station and the other one and O&M expenses are very high compared to the generating stations belonging to NTPC and NHPC generating stations. This is due to the small unit size and their old vintage, high man/MW ratio deployed at the stations and due to high overhead expenses which include provision for contribution to pension & gratuity fund and relief paid to the pensioners on the basis of "pay as you go".

44. DVC has prayed for allowing O&M expenses based on actual and giving them more time to rationalize manpower deployed at the generating stations by redeploying them in the new units coming up over a period of time or through offering VRS to the employees. DVC has further submitted that C&AG has now prescribed to make provision of pension liabilities on "Actuarial Valuation" in terms of Accounting Standard 15 which implies matching investment. According to DVC, the present provision of contribution to PG fund is in respect of the existing pensioners only. Under the provision of PG fund liabilities in respect of the existing employees in the past years is to be provided for as per AS-15. The total estimated financial implications on this account are indicated as Rs.1500 crore.

45. DVC was directed to furnish the year-wise fund requirement duly supported with basis and computations. Instead of furnishing these details, DVC has furnished a certificate of the Chartered Accountants regarding estimate of pension liabilities of Rs.1500 Crore. It could be appreciated that it may not be appropriate to make any specific recommendations regarding creation of pension liability fund additionally only on the strength of above certificate. However, present pension and gratuity fund liability and pension relief may be accounted for to arrive at the reasonable O&M expenses for the generating stations/transmission system.

46. In the normalization process, following expenses which are part of actual O&M expenses shall not be considered apart from normalization of abnormal increase in specific heads of accounts in the absence of suitable justification:

(i) **Festival Advances**: Such expenditures are recoverable and as such need not be considered for normalization purpose.

(ii) **Arrears:** It is a common knowledge that 5th Pay Commission recommendations were finalized in 1997 and were made effective from 1.4.1996. Arrears of pay were generally paid in the year 1997-98. As such, payments relating to arrears of pay even if paid beyond 1997-98 could possibly be for the past period and therefore, should not be considered for normalization purpose.

(iii) **Productivity incentive**: This expenditure cannot be loaded on the beneficiaries and is required to be met through incentive earned or profit.

(iv) **Bonus Equivalent:** Such expenditures are beyond the statuary bonus granted by Govt. of India and as such can not be considered for normalization purpose.

(v) **Adhoc to staff/officers**: The payment of interim relief should stop after revision of pay based on the recommendations of the Pay Commission or adjusted for in the arrear of pay and hence such expenditures can not be considered for normalization purpose.

(vi) **Loss of assets/stores**: These though accounting requirement, cannot be loaded on the beneficiaries for normalization purpose.

(vii) **Allocation of share of subsidiary activities other than soil conservation**: Such expenditures are not directly related to power and as such cannot be considered for normalization purpose.

47. I recommend that O&M expenses to be allowed shall be based on above considerations. While dealing with O&M expenses of the generating stations and the transmission system, I will consider these issues.

O&M for Thermal Stations

48. DVC has claimed following O&M expenses in Rs. Crore for the tariff period:

Sl. No.	Name of Station	Capacity (MW)	2004-05	2005-06	2006-07	2007-08	2008-09
A	**Thermal Stations**						
1	Bokaro TPS	877.50	155.54	161.76	168.23	174.96	181.96
	Rs. lakh/MW		17.73	18.43	19.17	19.94	20.74
2	Chandrapur TPS	780.00	168.26	174.99	181.99	189.27	196.84
	In Rs. lakh/MW		21.57	22.43	23.33	24.27	25.24
3	Durgapur TPS	350.00	128.43	133.57	138.91	144.47	150.25
	Rs. lakh/MW		36.69	38.16	39.69	41.28	42.93
4	Mejia TPS	630.00	106.30	110.55	114.98	119.58	124.36
	Rs. lakh/MW		16.87	17.55	18.25	18.98	19.74
5	Maithon GPS	82.50	9.73	10.12	10.53	10.95	11.38
	Rs. lakh/MW		11.79	12.27	12.76	13.27	13.79
	Total Thermal	**2720.00**	**568.26**	**590.99**	**614.64**	**639.23**	**664.79**
	Rs. lakh/MW		**24.31**	**25.28**	**26.29**	**27.34**	**28.43**

49. The above claim is based on actual expenses for the period 1998-99 to 2002-03 and includes proportionate expenses of Directors' Office and Other Offices, share of general overheads, share of operating expenses of subsidiary activities and share of operating expenses of the fuel, apart from station expenses.

50. O&M expenses in lakh/MW for the capacity in use are as follows:

(Rs in lakh/MW)

Name of Station	Capacity (MW)	2004-05	2005-06	2006-07	2007-08	2008-09
Bokaro TPS	630.00	24.69	25.68	26.70	27.77	28.88
Chandrapur TPS	390.00	43.14	44.87	46.66	48.53	50.47
Durgapur TPS	350.00	36.69	38.16	39.69	41.28	42.93
Mejia TPS	630.00	16.87	17.55	18.25	18.98	19.74
Total Thermal	**2000.00**	27.93	29.04	30.21	31.41	32.67

51. These O&M expenses are definitely higher than the similar capacity stations of NTPC and NLC. DVC has submitted that it is because of high manpower deployed at its generating stations and includes expenses on the salaries of the employees, security expenses and housekeeping and the up keep of the capacity not in use apart from provision of Pension and Gratuity Fund and Pension relief to the pensioners. It has further prayed for allowing the actual O&M expenses and also for time to rationalize the manpower at the generating station by redeploying the excess manpower at the new generating capacities to be built or by offering VRS scheme.

52. DVC vide affidavit dated 8.3.2006 has furnished reasons for the abnormal increase in O&M expenses in respect of Chandarpur TPS, Durgapur TPS and Mejia TPS under certain heads such as salary and wages under maintenance, administrative expenses, share of O&M expenses in fuel etc. The same has been considered by me. The increase in administrative expenses in certain years was on account of booking of loss in stores/spare which had become unserviceable and the same have been deducted in the normalization process. In respect of certain heads, such as share of O&M expenses of fuel, salary & wages under operation in Mejia TPS for 2002-03 etc., reasons of abnormal increase are not clear from the justification furnished and the increase has been restricted to 20%. The operating expenses relating to fuel are the expenses relating to establishment and handling charges for the fuel, in addition to the landed cost of the fuels and have been considered for the purpose of normalisation.

53. Accordingly, as per the methodology discussed above at para 46, I recommend that the normalized O&M expenses for the thermal generating stations for the year 2003-04 (Base Year) may be worked out as follows:

(Rs. in crore)

Sl. No.	Name of Station	As claimed	Normalised O&M for 2003-04	Normalised O&M (Rs. in lakh/MW)
A	**Thermal Stations**			
1	**Bokaro TPS**	149.56	113.79	18.06
2	**Chandrapur TPS**	161.79	115.91	29.72
3	**Durgapur TPS**	123.49	93.08	26.59
4	**Mejia TPS**	102.21	79.96	12.69
5	**Maithon GPS**	9.36	0.00	0.00
	Total Thermal	**546.40**	**402.73**	**20.14**

54. The above O&M expenses of the thermal generating stations in Rs. in lakh/MW are corresponding to the capacity in operation. The above O&M expenses may be allowed without any escalation during the tariff period . A similar view has been taken in case of Badarpur TPS where normalized O&M expenses allowed after prudence check are without any escalation over the tariff period, In my view, this will allow sufficient time to DVC to rationalize its O&M expenses by redeploying the manpower or offering VRS to its employees.

55. Accordingly following O&M expenses may be allowed during the tariff period:

				Amounts in Rs. in crore		
Sl. No.	**Name of Station**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**
1	**Bokaro TPS (3x210 MW=630 MW)**					
	Claimed Rs. Crore	155.54	161.76	168.23	174.96	181.96
	Norm (Rs. Lakh/MW)	18.06	18.06	18.06	18.06	18.06
	O&M in Rs. Crore	113.79	113.79	113.79	113.79	113.79
2	**Chandrapur TPS (3x130 MW=390 MW)**					
	Claimed Rs. Crore	168.26	174.99	181.99	189.27	196.84
	Norm (Rs. Lakh/MW)	29.72	29.72	29.72	29.72	27.93
	O&M in Rs. Crore	115.91	115.91	115.91	115.91	108.93
3	**Durgapur TPS (1x140MW+1x210MW= 350 MW)**					
	Claimed Rs. Crore	128.43	133.57	138.91	144.47	150.25
	Norm (Rs. Lakh/MW)	26.59	26.59	26.59	26.59	26.59
	O&M in Rs. Crore	93.07	93.07	93.07	93.07	93.07

4	**Mejia TPS (3x210 MW=630 MW**)					
	Claimed Rs. Crore	106.30	110.55	114.98	119.58	124.36
	Norm (Rs. Lakh/MW)	12.69	12.69	12.69	12.69	12.69
	O&M in Rs. Crore	79.96	79.96	79.96	79.96	79.96
	Total Thermal					
	Claimed Rs. Crore	**558.53**	**580.87**	**604.11**	**628.28**	**653.41**
	Admissible O&M in Rs. Crore	**402.73**	**402.73**	**402.73**	**402.73**	**402.73**

56. DVC may be given liberty to approach the Commission for the revision of O&M norms if any capacity which is not operating at present comes on bar after R&M.

O&M expenses for Hydro generating stations

57. DVC has claimed following O&M expenses for the period 2004-09 :

(Rs. in lakh)

Station	2004-05	2005-06	2006-07	2007-08	2008-09
Panchet	1109	1153	1199	1247	1297
Maithon	1493	1553	1615	1680	1747
Tilaiya	307	319	332	345	359

58. The above claim is based on actual O&M expenses for the period 1998-99 to 2002-03 and include proportionate expenses relating to Directors' Offices & Other Offices, share of operating expenses of Subsidiary Activities, proportionate share of dams & the general overhead charge etc.

59. DVC has submitted following details of actual O&M expenses incurred during the five years period of 1998-99 to 2002-03 in support of O&M expenses claimed, based on the methodology specified in Regulation 38 (iv) of the 2004 regulations:

(Rs. in lakh)

Station	1998-99	1999-00	2000-01	2001-02	2002-03
Panchet	479	571	637	2400	652
Maithon	875	904	967	2769	868
Tilaiya	192	266	289	270	294

60. It has been observed that actual O&M expenses for years 2001-02 in respect of Panchet and Maithon hydro generating stations are much higher compared to the expenses for other years. DVC vide affidavit dated 12.9.2005 has submitted that higher O&M expenses during 2001-02 were on account of the provision of pollution control claim of Rs. 1572 lakh for Maithon hydel and provision of Rs. 1502 lakh for abandoned work of tail pool dam of Panchet hydel. I may observe that these are one-time expenses and are not of regular nature. DVC has not submitted any details indicating that such type of expenses are likely to be incurred during the period 2004-09. Hence these expenses have not been considered for the purpose of normalization of O&M during 2004-09.

61. The details of actual expenditure incurred relating to O&M cost (Revenue), have been scrutinised. It has been observed that expenditure incurred on arrears of pay and allowances, productivity incentive, festival advances, loss of asset, ad hoc payments to staff/officers, bonus equivalent have been included in the claim of the petitioner. Such type of expenses have not been considered for normalization of O&M expenses, as deliberated while arriving at O&M expenses pertaining to thermal generating stations. Further, since capital cost related to 'Subsidiary Activities' has not been considered in total capital cost, proportionate O&M expenses for the same has also not be included in O&M cost, except O&M expenses relating to soil conservation activities.

62. At the hearing held on 13.2.2006 a plea was made on behalf of DVC that expenses in respect of soil conservation and afforestation should be included towards O&M expenses. DVC representative explained that soil conservation is an activity

required for maintaining the compactness of soil in the catchment area and is a precautionary measure towards soil erosion which further results in siltation of the dam. I had directed DVC to submit a detailed note on soil conservation activities associated with power generation along with its share towards hydro and thermal generation during the period 1998-99 to 2002-03, year-wise. DVC vide affidavit dated 8.3.2006 has furnished the details for considering soil conservation and afforestation activities of Damodar Valley towards O&M expenses. It has been explained that DVC authority had envisaged the problem of soil erosion of Damodar-Barakar catchments from the very beginning and formed Soil Conservation Department in 1949 with some specific objectives. The prime objective was to reduce soil erosion in the upper valley of Damodar-Barakar catchments to prolong the life of major water storing reservoirs of DVC namely, Pachet, Maithon, Tilaiya and Konar. It has been further observed that in the recent past the problem of soil erosion in the upper valley has aggravated mainly due to illegal mining, depletion of forest, excessive of population etc. According to DVC, due to excessive soil erosion, draining net work gives rise to series of problems. These are mainly -

(a) Steady loss of storage capacity in major water-storing reservoirs of DVC.

(b) Consistent drop of available water for hydro electric generation and irrigation in the lower valley.

(c) Decrease in available water for thermal power plants.

(d) Depletion of flow capacity.

(e) Frequent floods.

63. It has been explained that since inception approximately 16000 check dams have been constructed in the upper valley of Damodar-Barakar catchments depending

upon the contour of that area. As a result, approx 192 million Cubic Meter of silt has been arrested. The above soil conservation measures virtually increases the flood moderation capacity of the DVC reservoirs significantly. Afforestation works have been taken up by the DVC authority to minimize environmental pollution and also to maintain ecological balance in the upper valley for Damodar-Barakar catchments by planting more than 2- 2.5 lakh trees annually. Prolongation of life of the reservoirs through soil conservation activities is, therefore, directly linked with generation (both Thermal & Hydro) of power in the DVC valley area for days to come.

64. I find merit in the justification given by DVC regarding necessity of soil conservation and afforestation activities by DVC. Accordingly, I have considered it appropriate to add proportionate cost of such activities in O&M expenses.

65. The number of employees in three hydro stations of DVC vis-à-vis sanctioned strength are as follows:

Station	Installed Capacity (MW)	No. of employees	
		Sanctioned	Actual*
Panchet	80	85	193
Maithon	60	107	153
Tilaiya	4	51	151

(*)- Actual during 2002-03.

66. It is seen that number of employees on all the three hydro stations are much higher than the sanctioned strength. DVC has submitted that it may be allowed time to rationalize the manpower as there is a plan for redeployment of manpower in the upcoming generating units of DVC viz. Mejia and Chandrapura Extension Units. DVC may be given time up to 31.3.2009 for redeployment of the excess manpower as per their submission.

O&M expenses allowed

67. After prudence check and without considering the O&M expenses as discussed above, the following O&M expenses have been considered for the period 1998-99 to 2002-03:

(Rs. in lakh)

Station		1998-99	1999-00	2000-01	2001-02	2002-03
Panchet	Claimed	479	571	637	2400	652
	Considered	492	516	569	618	615
Maithon	Claimed	875	904	967	2769	868
	Considered	791	833	874	904	825
Tilaiya	Claimed	192	266	289	270	294
	Considered	214	222	256	256	277

O&M expenses for the tariff period 2004-09 :

68. Considering the actual O&M expenses for the period 1998-99 to 2002-03 given in the above table and further as per methodology stated in Regulation 38 (iv) of 2004 regulations, O&M expenses for the tariff period 2004-09 shall work out as follows:

(Rs. in lakh)

Station		2004-05	2005-06	2006-07	2007-08	2008-09
Panchet	Claimed	1109	1153	1199	1247	1297
	Considered	660	687	714	743	772
Maithon	Claimed	1493	1553	1615	1680	1747
	Considered	993	1033	1074	1117	1162
Tilaiya	Claimed	307	319	332	345	359
	Considered	288	299	311	324	337

O&M expenses for transmission system

69. DVC has claimed the following O&M expenses for the period 2004-09.

(Rs. in lakh)

2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**
4237	4405	4582	4765	4955

70. In support of its claim, DVC has submitted the details of O&M expenses actually incurred during last 5 years from1998-99 to 2002-03 for calculation of Base O&M for the year 2003-04 as under:

(Rs. in lakh)

1998-99	1999-2000	2000-01	2001-02	2002-03	Average	Base
2941	3470	3729	3795	4169	3621	4073

71. On base O&M of Rs 4073 lakh in 2003-04, escalation of 4% has been applied to arrive at O&M expenses for the period 2004-09.

72. For proper examination of the claim of DVC, I had ordered DVC to submit the year-wise details of O&M expenses for the period 1998-99 to 2002-03. In the response, DVC submitted year-wise actual O&M expenditure for the period 1998-1999 to 2002-03 as given below:

Actual O&M Expenses as submitted by DVC

(Rs in lakh)

Particulars	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Transmission & Distribution	2268	2700	2881	3254	3372
Communication	363	408	416	370	525
Flood Warning Station	0	0	0	0	0
CLD	107	98	112	110	224
Total	2738	3206	3409	3734	4121
Allocated to Transmission (87%)	**2382**	**2789**	**2966**	**3249**	**3585**
Proportionate share of Direction & other office	83	36	34	43	45
Proportionate share of General Overhead Charges	441	610	692	469	490
Share of Operating expenses of Subsidiary A/C	35	35	37	35	50
Total	**2941**	**3470**	**3729**	**3796**	**4169**

73. The year-wise details for last 5 years, from 1998-1999 to 2002-03 have been examined and it has been found that expenditure incurred on production incentive, arrears, festival advances, loss of asset, *ad hoc* to staff, bonus equivalent etc. have been included in the claim. In regard to share of operating expenses of subsidiary account, the expenses on activities other than soil conservation (related to power)

have also been included in the O&M claim. As discussed in para-46 such expenses are required to be excluded from the claim. The year-wise details are summarized below:

Deduction in actual O&M Expenses after applying prudence for 5 years

(Rs in lakh)

Particulars	1998-99	1999-00	2000-01	2001-02	2002-03
Transmission & Distribution	225	155	40	493	43
Communication	57	12	6	4	4
CLD	36	3	1	4	119
Total	318	170	47	500	166
Allocated to Transmission- 87%	**277**	**148**	**41**	**435**	**144**
Proportionate share of General Overhead Charges	248	291	365	149	175
Share of Operating expenses of Subsidiary A/C [other than Soil Conservation activities]	10	10	10	12	13
Total	**534**	**449**	**416**	**596**	**333**

Calculation of O&M expenses for DVC transmission system

(Rs in lakh)

	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	Average
Admitted Actual O&M Expenses	2105	2642	2925	2813	3441		2785
Proportionate share of Direction & other office	83	36	34	43	45		48
Proportionate share of General Overhead Charges	193	318	327	320	314		295
Share of Operating expenses of Subsidiary A/C	25	25	27	23	37		27
Total	**2407**	**3021**	**3313**	**3199**	**3836**		3155
BASE O&M [after applying escalation factor of 4%]			3155	3282	3413	**3549**	
Proportionate share of actual Miscellaneous Expenditure in General Overhead Charges during 2003-04 (87%)					=	155	
				Total		**3704**	

74. The average of above actual expenses for last five years is Rs.3155 lakh and it falls in 2000-01. After applying escalation factor of 4% in 2001-02, 2002-03 and 2003-04, the base O&M in year 2003-04 is Rs 3704 lakh. By further applying the escalation factor of 4%, the following O&M expenses are worked out for the period 2004-09.

O&M Expenses for 2004-09

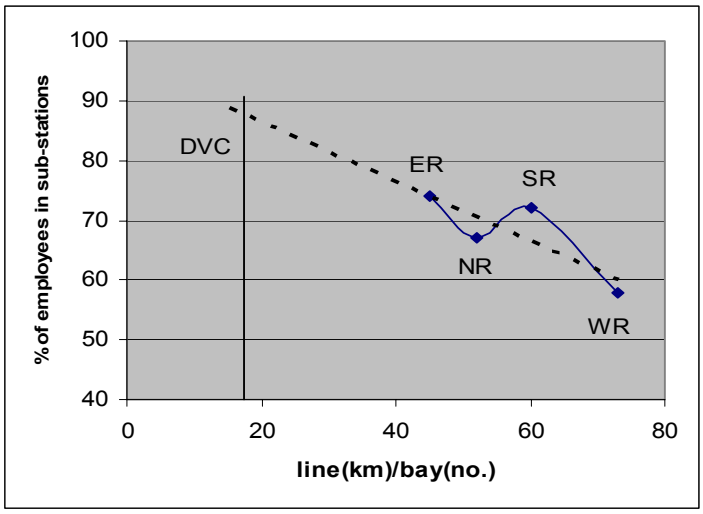
(Rs in lakh)

	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
O&M Expenses	3853	4007	4167	4334	4507

Calculation of per ckt-km and per bay O&M norms

75. The above O&M expenses based on actual and arrived at after the prudence check may be allowed for the existing transmission system of DVC. However, in order to deal with addition of a transmission lines and substation in future, it may be advisable to convert above O&M expenses into norms in terms of Rs. lakh/km and Rs. lakh/bay terms in line with the norms for the transmission system as per the 2004 regulations. For this purpose, O&M expenses shall have to be divided between lines and sub-stations. In case of formulation of norms for the period 2004-09, Commission had divided actual O&M expenses of PGCIL in the ratio of man power deployed at the sub-stations and the lines.

76. DVC has not furnished bifurcation of number of employees employed for maintenance of sub-stations and transmission lines. The ratio of line (Ckt.-Km)/bay (nos) in DVC is 4538/250=18.15. To arrive at fair estimate of division of total O&M expenses between sub-stations and lines, the following graph is plotted between line (Ckt.-Km)/bay (nos) and % of employees in sub-stations in case of different regions of PGCIL.



77. When the graph is extended to find out the intersection point at 18.15 i.e. line (Ckt-Km)/bay (nos) in case of DVC, we find that 87% share of employees will be assigned for sub-stations. Since major component of O&M expenses is on account of employee cost, it is fair to assume that total O&M expenses as furnished by DVC may be bifurcated in the ratio of 85:15 (Sub-stations: lines) for preparation of O&M norms for DVC.

78. Applying ratio of 85:15 over O&M expenses of Rs 3704 lakh for base year 2003-04, the norms would be Rs 12.59 lakh per bay and Rs 0.122 lakh per ckt-km. The values when escalated @ 4% per annum yield the following year norms.

Proposed Norms for O&M expenses per bay and per Ckt-km for DVC

	Year				
	2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**
O&M expenses (Rs in lakh per ckt-km)	0.127	0.132	0.138	0.143	0.149
O&M expenses (Rs in lakh per bay)	13.10	13.62	14.17	14.73	15.32

79. We have compared the O&M charges arrived at for DVC with O&M charges payable to PGCIL for Eastern Region and All India. We find that O&M charges

payable to DVC in terms of paise/kWh are on the higher side. This is quite understandable because the DVC transmission system is mostly 220 kV/132 kV whereas in case of PGCIL the transmission system is mostly at 400 kV.

80. I recommend the norms as per above table at 78 may be adopted.

Depreciation

81. DVC has furnished the details of cumulative depreciation recovered separately for each generating station, the transmission system and the distribution system and for the Directors' Offices, Central Offices, Other Offices and Subsidiary Activities. The cumulative depreciation also includes cumulative depreciation recovered for the capacity not in use. These cumulative depreciation recovered for the capacity not in use is not made available separately. However, for the purpose of computing balance depreciation to be recovered in tariff, it could be presumed that 90% of depreciation of cost associated with capacity not in use is already recovered as this capacity has already completed its rated useful life. The smaller capacity units in Chandrapur and Durgapur TPS have already served their rated life and in case of 210 MW units of Bokaro "B" and Durgapur TPS separate asset-wise break-up is not made available. As such, for these generating stations' balance depreciation may be recovered at the rate of 3.6% considering 25 years life of the thermal generating stations. In case of Mejia TPS, the depreciation may be recovered at the weighted average rate as per the 2004 regulations. Similarly, hydro generating stations of DVC have also outlived their rated useful life and in their case also the balance depreciation may be recovered at the rate of 2.57% considering 35 years life of the hydro generating stations. In case of transmission system, the dates of commercial operation of individual lines and sub-stations are not known. Therefore, in case of transmission system the balance

depreciation may be recovered at the rate of 3% considering average life of 30 years based on 35 years life of lines and 25 years for the sub-stations.

82. Further, cumulative depreciation of Rs.1422 lakh has been recovered up to 31.3.2004 out of the capital investment of Rs.4418 lakh on Directors' Offices, Central Offices and Other Offices. Balance depreciation of Rs.2554 lakh may be allowed to be recovered as additional O&M at the rate of 3.6%, that is, Rs. Rs. 159 lakh/year, considering 25 years life of the thermal generating stations as major component allocated to the thermal. This may be allocated to O&M of the respective generating station and the transmission system in proportion to their cost.

83. Cumulative depreciation of Rs.461 lakh has been recovered up to 31.3.2004 out of the capital investment of Rs.3469 lakh on Subsidiary Activities. The capital investment on soil conservation activities and associated cumulative depreciation recovered is not available separately. The balance cumulative depreciation against investment on soil conservation activities may be allowed in O&M additionally to be recovered at 3.6% provided details are furnished by DVC in this regard.

Operation Norms

Thermal

84. The energy charges claimed by DVC are based on following operational norms:

Parameter	Unit	Bokaro TPS	Chandrapura TPS	Durgapur TPS	Mejia TPS
TA	%	35.00	36.00	77.00	81.00
TPLF	%	35.00	28.83	48.00	81.00
SHR	kCal/kWh	3744.00	3379.00	3491.00	2968.00
AEC	%	10.80	11.50	12.20	11.10
SFC	ml/kWh	3.60	2.60	7.30	4.80

85. The above norms are based on following operational performance of DVC stations for the year 2004-05:

Parameter	Unit	Bokaro TPS	Chandrapura TPS	Durgapur TPS	Mejia TPS
TPLF	%	49.00	34.00	54.00	73.00
SHR	kCal/kWh	3686.00	3640.00	3551.00	3297.00
AEC	%	11.30	14.70	11.30	10.94
SFC	ml/kWh	4.00	16.40	9.60	5.20

86. The performance of DVC thermal generating stations for the last five years is poor. This is on account of their old vintage and the fact that the small size units have either outlived their rated life or are near completion of their rated life. The poor performance of 210 MW units at Bokaro “B” TPS and Durgapur TPS is attributed to design deficiencies leading to frequent breakdowns and frequent tube leakages. Moreover, these units are stated to be first generation units of LMZ class. But there is no proper justification for poor performance parameters for the relatively new units of 210 MW at Mejia TPS.

87. DVC has submitted that it is making all endeavors to bring improvements in the performance of the capacity in use and has sought time for this purpose. Accordingly, DVC has sought to be allowed the following operational norms for the units in use and performing, of unit sizes 130/140 MW and 210 MW vide affidavit dated 8.3.2006:

Operational Parameter	2004-05	2005-06	2006-07	2007-08	2008-09
Bokaro TPS "B" (3x 210 MW)					
Target Availability (%)		50	55	60	65
Target PLF (%)		50	55	60	65
SHR (kCal/kWh)		3300	3250	3200	3100
AEC (%)		10.8	10.5	10.25	10
SFC (ml/kWh)		4	3.5	3	2.5
Chandrapur TPS (3x130 MW)					
Target Availability (%)		55	55	55	55
Target PLF (%)		55	55	55	55
SHR (kCal/kWh)		3100	3100	3100	3100
AEC (%)		11.5	11.5	11.5	11.5
SFC (ml/kWh)		3	3	3	3
Durgapur TPS (1x140 MW)					
Target Availability (%)		60	65	70	72.5
Target PLF (%)		60	65	70	72.5
SHR (kCal/kWh)		3100	3100	3000	3000
AEC (%)		11.5	11.5	11	11
SFC (ml/kWh)		3.5	3.5	3	3
Durgapur TPS (1x 210 MW)					
Target Availability (%)		55	57.5	60	65
Target PLF (%)		55	57.5	60	65
SHR (kCal/kWh)		3100	3100	3000	3000
AEC (%)			11.5	11	
SFC (ml/kWh)		6	5	4	4
Mejia TPS (3x 210 MW)					
Target Availability (%)		75	78	80	80
Target PLF (%)		75	78	80	80
SHR (kCal/kWh)		2650	2625	2600	2550
AEC (%)		11	10.8	10.5	10.25
SFC (ml/kWh)		3.5	3.25	3	2.75

88. DVC has not specified any norm for the period for the year 2004-05 as it is already over.

89. From the above, it can be seen that DVC is seeking operational norms of 210 MW units at Bokaro "B" and Durgapur TPS as that of 130/140 MW units which, in my opinion is not appropriate. Similarly, relaxed norms for the Units of 210 MW at Mejia TPS are also not justified. However, we appreciate the concern of DVC that the

performance cannot be improved overnight. Therefore, I recommend that 210 MW units at Mejia TPS which are relatively new, operational norms as specified in the 2004 regulations for 210 MW units should be achieved by the terminal year 2008-09. Similarly, for units of 210 MW of Durgapur TPS and Bokaro 'B' and for units of 140 MW in Chandrapur TPS and Durgapur TPS which are of old vintage and have outlived their rated life or near completion of their rated life may be allowed to achieve the relaxed operational norms by the terminal year 2008-09. Accordingly, I recommend the following norms may be allowed for the performing units during the tariff period:

Operational Parameter	2004-05	2005-06	2006-07	2007-08	2008-09
Bokaro TPS "B" (3x 210 MW)					
Target Availability (%)	50	50	55	65	75
Target PLF (%)	50	50	55	65	75
SHR (kCal/kWh)	3300	3300	3100	2900	2700
AEC (%)	10.8	10.5	10.5	10.25	10.25
SFC (ml/kWh)	4	4	3.5	2.75	2.00
Chandrapur TPS (3x130 MW)					
Target Availability (%)	55	55	55	55	60
Target PLF (%)	55	55	55	55	60
SHR (kCal/kWh)	3100	3100	3100	3100	3100
AEC (%)	11.5	11.5	11.5	11.5	11.5
SFC (ml/kWh)	3	3	3	3	3
Durgapur TPS (1x140 MW)					
Target Availability (%)	60	60	65	70	72.5
Target PLF (%)	60	60	65	70	72.5
SHR (kCal/kWh)	3100	3100	3100	3000	3000
AEC (%)	11.5	11.5	11.5	11	11
SFC (ml/kWh)	3.5	3.5	3.5	3	3
Durgapur TPS (1x 210 MW)					
Target Availability (%)	55	55	57.5	65	75
Target PLF (%)	55	55	57.5	65	75
SHR (kCal/kWh)	3100	3100	3100	2900	2700
AEC (%)	11.5	11.5	11.0	10.50	11.0
SFC (ml/kWh)	6	6	3.5	2.75	2.00
Mejia TPS (3x 210 MW)					
Target Availability (%)	75	75	78	80	80
Target PLF (%)	75	75	78	80	80
SHR (kCal/kWh)	2650	2650	2600	2550	2500
AEC (%)	11	11	10.4	9.6	9.00
SFC (ml/kWh)	3.5	3.5	3.00	2.50	2.00

Hydro

12% free power to the home State

90. The 2004 regulations stipulate that saleable primary energy rate for the computation of primary energy charge of hydro station is determined after taking into account the 12% free power to the home state. DVC in its affidavit dated 12.9.2005 has submitted that tariff and terms and conditions for generation and sale of electricity by DVC were ealier determined under the DVC Act, wherein there was no provision of 12% free power to the home State. It appears that DVC does not favour free power to the home State.

91. We have considered the matter. Since power is to be supplied within the Damodar Valley and the hydro generating stations are also located in DVC area, there is merit in the submission of DVC. As such free power to the home State may not be considered.

Primary energy rate for subsequent years of the tariff period

92. The rate of primary energy for all hydro generating stations except for pump storage generating stations, shall be equal to the previous Financial year's lowest variable charges of the central sector thermal power generating stations of the Eastern region. The primary energy charge shall be computed based on the primary energy rate and saleable scheduled primary energy. The primary energy rates for the remaining years of tariff period shall be determined on the same basis, by DVC in consultation with the beneficiary states.

93. My recommendations on different aspects considered above may be placed before the Commission for its consideration. There has been some delay in finalizing these recommendations. This is primarily because of the complicated nature of the matter involving detailed deliberations and study. I request the Commission to condone the delay in finalization of my recommendations.

Sd/-
(K.N. SINHA)
MEMBER

New Delhi dated the 5th May 2006