

**ORISSA ELECTRICITY REGULATORY COMMISSION**  
**BIDYUT NIYAMAK BHAWAN,**  
**UNIT – VIII, BHUBANESWAR – 751 012**

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**Present : Shri B. K. Das, Chairperson**  
**Shri K. C. Badu, Member**

**Case No.64/2008**

**DATE OF HEARING : 02.02.2009**

**DATE OF ORDER : 20.03.2009**

**IN THE MATTER OF :** Application for approval of Annual Revenue Requirement and Tariff of OHPC stations for the FY 2009-10 under Section 86 of the Electricity Act, 2003 read with related provisions of OERC (Terms and Conditions for Determination of Tariff) Regulations, 2004 and OERC (Conduct of Business) Regulations, 2004.

**ORDER**

The Orissa Hydro Power Corporation (OHPC) has filed an application before the Commission for determination of Annual Revenue Requirement (ARR) and fixation of Tariff for its different power stations for the financial year 2009-10.

**PROCEDURAL HISTORY (Para 1 to 8)**

1. The OHPC is a “Generating Company” under the meaning of Sec.2 (28) of the Electricity Act, 2003. After the unbundling of the Orissa State Electricity Board (OSEB) in the year 1996, the assets, liability and personnel of the Board were transferred to this generating company to carry out the business of generation of hydro-electricity. The entire power produced by OHPC through its various generating stations is fully dedicated to the State of Orissa. Thus, OHPC is supplying its entire power to GRIDCO, who in turn is supplying the same to the Distribution Licensees of the State. After the Electricity Act, 2003 came into force and promulgation of the Government of Orissa Transfer Scheme, 2005, GRIDCO as the deemed trading licensee was entrusted with the bulk supply business and the existing Bulk Supply Agreements and Power Purchase Agreements (PPAs) have been assigned to it. Under the existing legal set up, GRIDCO is evacuating the powers from the generating stations of OHPC and delivering it to the Distribution Licensees.
2. From the above, it appears that the real beneficiaries of OHPC’s power are the Distribution Licensees of the State. Due to the current Single Buyer Model, as prevailing

in the State of Orissa, GRIDCO acts as a medium to receive the power produced by OHPC for the Distribution Licensees.

3. As per Regulation 61(2) of the OERC (Conduct of Business) Regulations, 2004, a generating company is required to file an application by 30<sup>th</sup> November of each year to the Commission for determination of tariff for any of its generating stations, for sale of energy in the State of Orissa giving details of fixed and variable costs associated with the generation and sale of energy from the generating stations. Accordingly, on 29.11.2008 OHPC, as a generating company, had filed its Annual Revenue Requirement (ARR) and fixation of tariff application before the Commission for the FY 2009-10 in respect of each of its generating stations separately.
4. After due scrutiny and admission of the aforesaid application, the Commission directed OHPC to publish its application in the approved format. In compliance to the same; public notice was given in leading and widely circulated newspapers and was also posted in the Commission's website, in order to invite objections from the general public. The applicant was also directed to file its rejoinder to the objections filed by the objectors. In response to the aforesaid public notice the Commission received 10 nos. of objections from the following persons/organizations:  

(1) State Public Interest Protection Council, Cuttack, (2) Sambalpur District Consumers Federation, Balaji Mandir Bhawan, Khetrampur, Sambalpur, (3) Mr. Jayadev Mishra, N-4/98, Nayapalli, Bhubaneswar, (4) Mr. Ramesh Ch. Satpathy, Secretary, National Institute of Indian Labour, 302(B), Beherasahi, Nayapalli, Bhubaneswar, (5) WESCO, Burla, Sambalpur, (6) Mr. R.P. Mohapatra, 775, Jayadev Vihar, Bhubaneswar, (7) Mr. M.V. Rao, Chairman, M/s. UCCI, N/6, IRC Village, Nayapalli, Bhubaneswar, (8) SOUTHCO, Courtpeta, Berhampur, (9) NESCO, Januganj, Balasore, (10) GRIDCO, Janpath, Bhubaneswar.

All the above named objectors were present during the tariff hearing except the objector No.1, but its written submission filed before the Commission, was taken on record and also considered by the Commission.
5. The date of hearing as fixed was duly notified in the leading and widely circulated newspapers mentioning the list of objectors. The Commission also issued notice to the Government of Orissa through the Department of Energy informing them the date of hearing and requesting the Government's authorised representative to take part in the proceedings.
6. In exercise of the power u/s.94(3) of the Electricity Act, 2003 and to protect the interest of the consumers, the Commission appointed Nabakrushna Choudhury Centre for Development Studies, Chandrasekharpur, Bhubaneswar the premier Govt. of Orissa's Institute as Consumer Counsel for objective analysis of the applicant's Annual Revenue

Requirement and tariff proposal. The Consumer Counsel submitted its report to the Commission and its representative put forth its analysis and views in the matter to the parties present during the hearing.

The Commission had also appointed PRAYAS, Energy Group, Amrita Clinic, Athawale Corner, Crave Road, Pune-411004, a consumer organization, as Consumer Counsels apart from the Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar. They were neither present during the hearing nor filed their objections/suggestions before the Commission in the above matter.

7. In its consultative process, the Commission conducted a public hearing at its premises on 02.02.2009 and heard the applicant, Objectors, Consumer Counsel and the representative of the Government.
8. The Commission convened the State Advisory Committee (SAC) meeting on 12.02.2009 to discuss about the ARR application and tariff proposal of the generating company. The members of SAC presented their valuable suggestions and views on the matter and the Commission considered the same.

#### **SUBMISSION OF OHPC FOR FY 2009-10 (Para 9 to 32)**

##### **Installed Capacity**

9. The total installed capacity of the various Hydro Stations owned by the Orissa Hydro Power Corporation (OHPC) is projected at 2062 MW for FY 2009-10 including Orissa's share of Machkund. An additional capacity of 150 MW was proposed for FY 2007-08 due to the extension of units 7&8 at Balimela power station. No further additions have been proposed for the ensuing financial year i.e. 2009-10. Accordingly, the installed capacity of different generating stations as proposed by OHPC for FY 2009-10 is given in the table below:

**Table - 1**

Sl. No.	Names of Power Stations	Installed Capacity (MW)			
		2006-07	2007-08	2008-09	2009-10
1	Hirakud (Burla & Chiplima)	347.50	347.50	347.50	347.50
2	Balimela	360	510	510	510
3	Rengali	250	250	250	250
4	Upper Kolab	320	320	320	320
5	Upper Indravati	600	600	600	600
6	Machhkund (Orissa Share)	34.50	34.50	34.50	34.50
<b>Total</b>		<b>1912</b>	<b>2062</b>	<b>2062</b>	<b>2062</b>

### Design Energy of OHPC Stations

10. The Commission in its order dated 10.06.2005 at para – 6.5 (a), had directed that re-assessment of design energy of OHPC Power Stations should be done by appointing an independent consultant under the auspices of the Commission. Accordingly, OHPC had awarded the assignment to M/s SPARC, Bhubaneswar, a consultancy agency, to carry out the job of re-assessment of design energy of its Power Stations. The Commission had regularly monitored the progress for early completion of the job. After completion of the job, a presentation was made on its findings along with the methodology adopted before the Commission on 30.01.2008. The Commission, vide its order dated 20.03.2008, had directed OHPC to file the reports on the re-assessment of design energy of its power stations duly vetted by its Board of Directors. Accordingly, OHPC submitted the reports to the Commission on 31.05.2008 for approval. The Commission in its letter dated 07.11.2008, had advised OHPC that since the task of re-assessment of design energy of the hydro stations was done, following the guidelines of the CEA as laid down in August 2004, the Commission in general is satisfied with the reports prepared by M/s SPARC. However, the Commission also advised OHPC that before the Commission finally approves re-assessment of design energy it is appropriate that the said reports are also reviewed by the experts of CEA considering the repercussion of such re-assessment on determination of hydro tariff. OHPC thereafter took up the matter with CEA. While filing its ARR application, OHPC has kept in view, the revised design energy figures in the calculation of its Annual Revenue Requirement and tariff for the FY 2009-10.

The existing design energy and the revised design energy (as prepared by M/s SPARC) of OHPC Power Stations considered for 2009-10 are given in the table below.

**Table – 2**

<b>Sl. No.</b>	<b>Name of the Power Stations</b>	<b>Existing Design Energy (MU)</b>	<b>Existing Design Energy for sale (MU)</b>	<b>Revised Design Energy (MU)</b>	<b>Revised Design Energy for sale (MU)</b>
1	HPS (Burla&Chiplima)	1174	1162.26	957.43	947.85
2	BHEP	1183	1171.17	928.56	919.27
3	RHEP	525	519.75	669.96	663.26
4	UKHEP	832	823.68	643.86	637.42
5	UIHEP	1962	1942.38	1703.82	1686.78
<b>Total</b>		<b>5676</b>	<b>5619.24</b>	<b>4903.63</b>	<b>4854.58</b>

### Project Cost

11. The ARR of OHPC's old Power Stations for the FY 2009-10 have been computed based on the historical cost of the projects as on 01.04.96 with audited additional capital expenditure till March'08 and estimated capital expenditure during FY 2008-09 as per the accounts of OHPC. Further, the Commission, in its order dated 22.03.07, (approval of ARR & Tariff of OHPC power stations for the FY 2007-08) have already approved Rs.1195.42 Crores as the final capital cost of Upper Indravati H.E. Project for the purpose of determination of tariff. The same has been considered for computation of ARR of UIHEP for the FY 2009-10. The project costs of OHPC Power Stations considered for computation of ARR for the FY 2009-10 are as given below:

**Table - 3**

<b>(Rs. in Crore)</b>					
<b>Sl. No.</b>	<b>Name of the Power Stations</b>	<b>Transferred Cost as on 01.04.06</b>	<b>Project Cost approved for FY 2007-08</b>	<b>Project Cost approved for FY 2008-09</b>	<b>Project cost considered for FY 2009-10</b>
1	HPS	295.17	368.09	370.42	397.37
2	BHEP	334.66	297.66	297.74	297.96
3	RHEP	259.01	93.69	93.81	93.84
4	UKHEP	307.96	109.18	112.19	112.27
<b>Total</b>		<b>1196.80</b>	<b>868.62</b>	<b>874.16</b>	<b>901.44</b>
5	UIHEP	-	1195.42	1195.42	1195.42

### Principles Adopted For Determination Of Annual Revenue Requirement

12. OHPC has been submitting the ARR and Tariff in respect of each of the power stations separately in conformity with CERC Regulations from the financial year 2005-06 onwards. OHPC has stated that the present filing is made as per CERC Regulations with regard to the terms and conditions for determination of generation tariff for hydro power stations.
13. The fixed assets are based on the historical cost as on 01.04.96 plus additions made thereafter as per audited accounts of OHPC.
14. The depreciation computed @ 2.57% on the project cost has been considered for the FY 2009-10. However, in case of HPS & BHEP, where loan repayment is more than the computed depreciation, the differential amount have been taken in the calculation as Advance Against Depreciation & included in the depreciation for the FY 2009-10. In case of UIHEP, the depreciation could be Rs.43.01 crore @3.60% of the project cost.

However, it is limited to the principal loan repayment of Rs. 32.08 crore for the year 2009-10 in line with the PPA.

15. Return on Equity (RoE) has been considered @ 14% per annum for the FY 2009-10 for each of the Power Stations with an equity base of 25% of the original project cost and additional capital expenditure of HPS, Burla. In case of BHEP extension project and additional capital expenditures of all the power stations except HPS, Burla, RoE has been considered @ 14% on an equity base of 30% as per the CERC norms.
16. Operation & Maintenance (O&M) expenses of UIHEP includes Rs.1 crore towards purchase of Fuji spares and Rs. 7 crore towards major repair of governor & excitation system (out of estimated Rs.14 crore, Rs. 7 crore has already been allowed by the Commission in FY 2008-09 and balance Rs.7 crore has been proposed in the FY 2009-10).
17. In case of HPS, addition of Rs.4.00 crore in O&M expenses includes Rs.1.50 crore, towards trash rack replacement of Unit 1&2 of Burla Power House and Rs. 2.50 crore towards renovation of switchyard of Chiplima Power House.
18. In case of RHEP, addition of Rs.3.42 crore in O&M expenses includes Rs.1.20 crore towards procurement of M/s BHEL Spares for generator and turbine and Rs. 0.22 crore towards replacement of UE relays of Unit-1 and Rs. 2.00 crore towards purchase of turbine blades.
19. In case of UKHEP, addition of Rs.0.70 crore has been proposed in O&M expenses for replacement of governor and excitation system of Unit -1&2.
20. Further, in O&M expenses OHPC has proposed Rs. 1 crore for each of the power stations towards infrastructure development of own colony and powerhouse premises.
21. A total amount of Rs. 85.26 crore has been proposed in O&M expenses for all the power stations towards salary revision including arrear salary.
22. The interest during construction (IDC) @ 13% has been proposed for the capital works to be taken up in the FY 2009-10. The expenditure will be taken into capital account after completion of work. The IDC of Rs. 0.78 crore is taken on the estimate of Rs. 6.00 crore towards cost of stator bar and rotor pole of Unit-I of RHEP. The IDC of Rs. 1.30 crore is taken on the estimate of Rs. 10.00 crore towards procurement of stator of Unit-4 of UKHEP (out of the estimated cost of Rs. 10.00 crore, interest on Rs. 5.00 crore was allowed in the FY 2008-09). The IDC of Rs. 1.43 crore is taken on the estimate of Rs. 10.00 crore towards replacement of excitation system and governor of Unit-1&2 of BHEP and Rs. 1.00 crore towards purchase of 20 T Crane. The IDC of Rs. 1.17 crore is taken on the estimate of Rs.6.00 crore towards installation of trash cleaning device in the

Chiplima power channel and on Rs.3.00 crore towards construction of hanging bridge for alternative connectivity to Ghanteswari temple at Chiplima powerhouse.

23. The interest on working capital, taken @ 13% per annum at par with the short-term prime lending rate of State Bank of India. For calculation of Working Capital, the cost of maintenance spares requirement for the FY 2009-10 has been arrived taking the average consumption for the FY 2005-06, FY 2006-07 and FY 2007-08 (as per the actual audited figure) and escalated at the rate of 6% for FY 2008-09 and 2009-10 as per CERC guidelines.
24. Electricity Duty (ED) @ 20 paise / KWh on Auxiliary Consumption, limited to 0.5% of the Design Energy, has been considered for the year 2009-10. However, the Commission has been requested to allow OHPC to claim reimbursement of actual ED on Auxiliary Consumption payable to the government at the end of the year 2009-10.
25. As per the CERC Tariff Regulation, 2004, Income Tax shall be computed as an expense and recovered from the beneficiaries. Accordingly, income tax paid by OHPC during FY 2007-08 in respect of RHEP, Rengali, BHEP, Balimela and UIHEP, Mukhiguda has been included in the computation of ARR for the FY 2009-10. Similarly, the income tax payable by OHPC for the FY 2008-09 shall be included in the ARR for the FY 20010-11.

**Total Annual Fixed Charges (AFC) / Annual Revenue Requirement (ARR):**

26. The station-wise AFC / ARR for the FY 2009-10 as proposed by OHPC are given in the table below :

**Table - 4**

**(Rs. in Crore)**

<b>Particulars</b>	<b>HPS</b>	<b>BHEP</b>	<b>RHEP</b>	<b>UKHEP</b>	<b>UIHEP</b>
Interest on Loan	7.23	10.99	0.31	0.37	2.88
Depreciation	12.50	13.55	2.41	2.89	32.08
Return on Equity @14%	13.91	11.71	3.30	3.96	41.82
O & M Expenses	70.47	40.45	41.81	31.43	75.45
Interest on working capital	3.26	2.50	1.76	1.34	4.59
ED on Aux. Consumption @20 P/U	0.10	0.09	0.07	0.06	0.17
Income Tax (MAT) for the previous years	0.00	6.65	0.12	0.00	8.74
Interest during construction	1.17	1.43	0.78	1.30	0.00
<b>Total ARR / AFC</b>	<b>108.64</b>	<b>87.37</b>	<b>50.56</b>	<b>41.35</b>	<b>165.73</b>
<b>Average Tariff (P/U)</b>	<b>114.62</b>	<b>95.04</b>	<b>76.23</b>	<b>64.87</b>	<b>98.25</b>

**Rate of Primary and Secondary Energy**

27. As per the CERC Tariff Regulations, Rate of primary energy for the hydro generating stations, shall be equal to average of the lowest variable charges of the Central Sector

Thermal Power Generating Stations of the concerned region for all the months of the previous year. The primary energy charges shall be computed based on the primary energy rate and saleable primary energy of the project.

In case, the primary energy charges recoverable by applying the above primary energy rate exceeds the Annual Fixed Charges of a generating station, the primary energy rate for such generating station shall be calculated by the following formula:

$$\text{Primary Energy Rate} = \frac{\text{Annual Fixed Charges}}{\text{Saleable Primary Energy}}$$

Based on the lowest variable cost of the Central Sector Thermal Power Station of the region approved by the Commission for payment by GRIDCO, the rate of primary energy of all the Power Stations of OHPC for the FY 2009-10 shall be worked out.

28. The rate of Secondary Energy is same as the Rate of Primary Energy as per the CERC Regulations and as approved by OERC for the previous years,
29. The station-wise average energy rates are summarized in the Table given below:

**Table-5**

<b>Name of the Power Station</b>	<b>Average Tariff (Paise/KWh)</b>
HPS (Burla & Chiplima)	114.62
BHEP	95.04
RHEP	76.23
UKHEP	64.87
UIHEP	98.25

### **Capacity Charge**

30. Two-part tariff has already been implemented at all the power stations of OHPC. As per the CERC Regulations, the Capacity Charges shall be computed in accordance with the following formula:

$$\text{Capacity Charges} = (\text{Annual Fixed Charge} - \text{Primary Energy Charge})$$

The monthly Capacity Charges shall be computed as per the formula given in the CERC Regulations. There shall be pro-rata recovery of Capacity Charges in case of the generating station achieves Capacity Index below the prescribed normative levels.

### **Machhkund H. E. (Jt.) Project**

31. The proposed tariff of 13.90 paise/KWh for Orissa drawal of Machhkund power for FY 2009-10 has been computed on cost reimbursement basis. Actual O & M Expenses of Rs. 2.60 crore for FY 2007-08 has been escalated @ 4% each year to arrive at Rs. 2.81 crore for FY 2009-10 and the power purchase cost of Rs. 0.84 crore has been computed @ 8 paise/KWh for 105 MU, the total annual expenditure being Rs. 3.65 crore for the year 2009-10. The cost per unit is 13.90 paise considering the 50% of the design energy of 525 MU for Machhkund.



OHPC has further stated that, there is proposal for R&M of the old generating units of Machhkund Power House, which may be started from the Financial Year 2009-10. In case of any additional expenditure on account of such R&M works during Financial Year 2009-10. OHPC may file an additional application for approval of revised ARR and Tariff for Machhkund Power Station during the year 2009-10.

### **Corrective Measures**

32. As stated in the tariff order dtd. 23.03.06 for the year 2006-07 in case no. 48 of 2005, the Commission have advised the State Govt. (i) to keep in abeyance the up-valuation of assets & (ii) moratorium on debt servicing to the State Govt. for a period of another five years beyond FY 2005-06 i.e. till 2010-11. In view of the above, in the tariff proposal for FY 2009-10, (a) the interest on loan, depreciation & RoE on the up-valued assets and (b) the interest & installment of principal payment on the State Govt. loan for UIHEP have not been considered.

OHPC submits that in case the above corrective measures are not accepted by the State Govt., then OHPC may be allowed additional revenue by way of interest on loan / bonds, depreciation for principal repayments of the loan /bonds & RoE on the transferred up valued cost of assets.

### **VIEWS OF THE OBJECTORS ON ARR & TARIFF OF OHPC FOR FY 2009-10 (Para 33 to 75)**

33. OHPC was allowed, at the outset of the hearing, to make a presentation on its ARR and tariff application for the FY 2009-10. The representative of Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar appointed as Consumer Counsel by the Commission presented its analysis of the proposal, objections and OHPC's rejoinder on ARR and tariff filing. Thereafter the objectors made their comments/observations on the proposed ARR of OHPC for FY 2009-10. Director (Tariff) then raised certain queries on the OHPC filing.
34. The Commission has considered all the issues raised by the participants in their written as well as oral submissions during the public hearing. Some of the objections were found to be of a general nature whereas others were specific to the proposed Revenue Requirement and Tariff filing for the FY 2009-10. Based on their nature and type, these objections have been categorized broadly as indicated below:

#### **Nabakrushna Choudhury Centre for Development Studies (NCCDS):**

35. In accordance with Section-94(3) of Electricity Act, 2003 which stipulates that the appropriate Commission may authorize any person as it deems fit to represent the interest of the consumers in the proceedings before it, the Commission engaged Nabakrushna Choudhury Centre for Development Studies as Consumer Counsel in order to receive

quality inputs/ feedback on the tariff proposal in the interest of different sections of consumers. The representative of NCCDS had analysed the application and some of the important observations are as follows:

36. Due to the existing single-buyer-model presently prevailing in the State of Orissa, OHPC is supplying its entire power to GRIDCO, who in turn is supplying power to the Distribution Licensees of the State. Tariff proposals for all the old power stations and UIHEP show significant increase in tariff during FY 2009-10 as compared to 2008-09 due to increase in their ARR. Out of these, tariff proposals for power stations like HPS and UKHEP show increase more than double in tariff. As against this, tariff for MHEP shows a decline.

**Table - 6**

**Comparison of Tariff of Different Power Stations between 2008-09 and 2009-10**

Power Stations	2008-09 (P/U) Approval by OERC	2009-10 (P/U) proposal of OHPC	% Change
HPS	52.11	114.62	119.96
BHEP	52.61	95.04	80.65
RHEP	49.40	76.23	54.31
UKHEP	25.82	64.87	151.24
UIHEP	67.28	98.25	46.03
MHEP	25.09	13.90	-44.60

37. This increase in tariff, if allowed, would impose heavy burden on the consumers of the State, observed the Consumer Counsel. OHPC has projected an increase in ARR to the tune of Rs. 153.85 (51.32%) during 2009-10 in order to meet the growing expenses of these five power stations.
38. The Consumer Counsel submitted that the ARR proposal for the power stations like HPS, RHEP and UKHEP had increased significantly during FY 2009-10 compared to the FY 2008-09. Table-7 below clarifies the point.

**Table - 7**

**ARR of Different Power Stations**

**(Rs. in Crore)**

Power Stations	2007-08 approval by OERC	2008-09 approval by OERC	% Change	2009-10 proposal by OHPC	% Change
HPS	63.69	60.56	-4.91	108.64	79.39
BHEP	62.68	61.62	-1.69	87.37	41.79
RHEP	18.28	25.68	40.48	50.56	96.88
UKHEP	17.49	21.26	21.56	41.35	94.50
UIHEP	130.46	130.68	0.17	165.73	26.82
All	292.60	299.80	2.46	453.65	51.32

39. The Consumer Counsel observed that the main reasons for significant increase in ARR of these power stations are on account of increase in O&M expenses, interest on working capital and return on equity.
40. The Consumer Counsel summarized the presentation by saying that there was scope for reducing ARR, as these power stations have proposed significantly higher increase in ARR. The Counsel felt that increase in tariff should not be allowed in the best interest of the consumers. On the other hand, there should be curtailment in Revenue Requirement for which there is a need to assess the Revenue Requirement of OHPC

**Review of Design Energy:**

41. Many objectors vehemently opposed the proposal of OHPC for reduction of design energy from 5676 MU to 4903.63 MU. They pointed out that the so-called revision of design energy is alarming and is much lower than the actual generation from inception. One of the objectors has given the statement of average generation of Hydro Stations during past years which are much higher than those proposed by OHPC. Some others have shown that the generation by OHPC stations during the recent pasts has been much higher than proposed for FY 2009-10. They submitted that design energy alone should not be the sole criteria for determining the availability of hydel stations and related factors like reservoir levels, amount of rainfall etc should also be considered as there is direct correlation between the hydel energy available for sale and the reservoir levels in each of the power stations.
42. As re-determination of design energy of the existing HEPs under OHPC has important bearing on determination of tariff, the objectors requested the Commission to finalise the revised Design Energy only after public hearing involving all stakeholders.
43. One objector pointed out that OHPC in its application has mentioned that 150 MW is added in the 360 MW Balimela Power House which has already been commissioned. But it is not known whether the design energy is increasing or decreasing for such addition. Another objector pointed out that as the units in the Burla Power House are up-rated, design energy should also be increased automatically.
44. OHPC has pointed out that the design energy has been calculated assuming water release from the reservoirs for domestic and industrial use. At the stage of construction of hydro electric projects, there was no provision for release of substantial quantity of power for industrial use. In case such substantial quantity of water is allocated for industrial purposes, it will not only reduce the design energy but will also reduce the capacity of the power station to produce peak energy and consequent UI charges. Therefore, the total loss of energy on account of use of water for industrial use should be fully compensated by the industries concerned.

**Equity Component:**

45. One of the objectors stated that equity component earlier claimed in the last years was not accepted and should not be accepted this time.

**Electricity Duty (ED):**

46. Some objectors stated that the excess ED payable over and above the stipulation was not to be reimbursed by GRIDCO.
47. One of the objectors requested the Commission to direct the Govt. of Orissa not to collect the electricity duty on the auxiliary consumption of the company.
48. Electricity Duty and income-tax should not be included under AFC but billed separately on monthly basis subject to annual adjustment.

**Credit towards Colony Consumption:**

49. One of the objectors pointed out that as per the guidelines, cost of auxiliary consumption i.e. 1% of generation can only be passed on to the consumers. As per the above provisions and the OERC order dated 1.11.2008, OHPC has to furnish the amount to be credited towards colony consumption so that the amount can be adjusted against the ARR of OHPC for FY 2009-10.

**Individual Station wise PPAs:**

50. Some of the objectors suggested that in accordance with the National Tariff Policy, the station-wise PPAs should be reassigned to the Distribution Companies with a definite time frame.
51. One objector has suggested for execution of separate PPAs for Hirakud Power House and Chiplima Power House, which had already been suggested by the reform consultants in 1996. He pointed out that lower capacity and energy generation at Chiplima was getting covered from the secondary generation of Hirakud. Both GRIDCO and the consumers are losing due to this.

**Prospective Plan for Hydro Development:**

52. Some of the objectors pointed out that OHPC should immediately plan to execute Hirakud B, Chiplima B, Sindol-I, II & III on priority basis as the project reports of these projects are available and approved by CEA. OHPC should also take action for pump storage projects and River link projects for improving both hydro and thermal generation capacity in the state.

**Capital Cost of Upper Indravati Hydro-electric Project:**

53. One objector has submitted that the Capital Cost of UIHEP at Rs 1195.42 crore taken for the purpose of tariff by the Commission is not correct as it should not exceed Rs. 468.07 crore due to the following grounds/reasons:

- (a) That contrary to the earlier Orders, the Hon'ble Commission in its orders dated 22.03.2007 in Case No. 54/2006 accepted the Capital Cost of the Upper Indravati Hydro-Electric Project at Rs. 1195.42 crore for the purpose of determination of tariff only.
- (b) That OHPC for long avoided taking steps to determine the Capital Cost of the UIHEP as ordered by the Hon'ble Commission.
- (c) The objector, therefore, submitted that the consumers of Orissa will be put to severe financial disadvantage, if the "provisional" capital cost is allowed for the determination of tariff for the year 2009-10 also. The Commission may kindly take steps to re-determine the capital cost of the UIHEP for the purpose of tariff in the interest of equity & justice.

**Balimela Extension:**

- 54. One objector submitted that the 7<sup>th</sup> Unit of Balimela Power House was put on commercial operation on 23.12.2008 and the 8<sup>th</sup> Unit was yet to be put on commercial operation. Return on Equity is only allowed after COD of the Unit. The Commission may, therefore, take a considered view on the ROE already allowed to OHPC during 2007-08 and 2008-09 (up to 22.12.2008).

**Functioning of OHPC:**

- 55. Some of the objectors submitted that OHPC was functioning like a subordinate office of the state government, which is against the very spirit of Orissa Electricity Reforms Act 1995. Govt. of Orissa has not yet appointed a full time CMD and full time Director (Finance) of the company. The company is not functioning like a business company of the state. The units functioning under OHPC are neither professionally managed nor managed commercially.
- 56. One objector pointed out that OHPC corporate office is functioning in a rented house for last 12 years and huge amount has been paid by OHPC as rent. Being a Govt. company, that should not be included in the annual revenue requirement. OHPC has to produce the asset register of the company before the Commission.
- 57. OHPC has not filled-up the posts of skilled workers in power houses and due to shortage of manpower, the work culture and productivity are reducing day by day.
- 58. OHPC has signed several MoUs with different companies for Thermal Power Generation. They should produce all documents before the Commission because any expenditure in this regard has to ultimately pass on to the consumer by way of tariff.

**O & M Expenses:**

- 59. Some of the objectors submitted that in the absence of Audited Accounts of OHPC for FY 2007-08, the O&M cost of Rs. 184.34 crore projected may not be considered. OHPC may be directed to submit the actuals of O&M expenses as on date.

60. The submissions on O & M Expenses by the objectors are briefly stated as follows:
- (a) As per PPA, 4% escalation is to be considered over the O&M permitted during the year 2008-09 after deducting additional O&M allowed therein.
  - (b) One objector has stated that instead of claiming O&M expenses at 4% extra over and above the previous year it would be more appropriate & reasonable to provide at actuals of 2008-09 and for 2009-10. Any extra expenses which can be substantiated by OHPC can be met from additional revenue generated from secondary energy.
  - (c) In the O&M, OHPC has included FBT & wealth tax, which is not a pass through in tariff. The same may be disallowed.
  - (d) OHPC may meet expenditure towards infrastructure and peripheral development work from its profit.
  - (e) Expenditure on switch yard renovation & trash-rack replacement of Chiplima Power House and purchase of turbine blades of Rengali Power House should be treated as capital expenditure instead of including the same under O&M.
  - (f) OHPC may come forward with a concrete programme to get rid of the weed problem at Chiplima to make effective use of the idle capacity.

**Depreciation:**

61. Some objectors have pointed out that OHPC has not submitted details of loan schedule. In the absence of loan repayment schedule, they propose depreciation of Rs 10.72 crore, Rs. 1.05 crore and Rs. 1.25 crore for 2009-10 as against Rs.12.5 crore, Rs. 2.41 crore and Rs. 2.89 crore in case of HPS, RHEP and UKHEP respectively for 2008-09.

**Interest on Working Capital:**

62. Some of the objectors submitted their comments on interest on working capital calculated by OHPC in its ARR which is briefly as under:
- (a) OHPC may not charge interest on working capital to reduce the impact on tariff.
  - (b) If at all the interest on working capital is charged, it should be computed at 11% instead of 13% proposed by OHPC.

**Interest on Loan:**

63. Some of the objectors submitted their comments on interest on loans calculated by OHPC in its ARR which are briefly as under:
- (a) The calculations made by OHPC is not in line with the correctives previously suggested by the OERC and accepted by the Govt. of Orissa.
  - (b) The interest on deemed loan should be disallowed

**Return on Equity:**

64. Some of the objectors commented on the proposal of OHPC on Return on Equity (ROE) in its ARR which are briefly stated as under:
- (a) The proposal of return on equity considering 14% per annum for FY 2009-10 for each power station with an equity base of 25% of the original project cost and additional capital expenditure is erroneous.
  - (b) In the absence of the statements on extent of capitalization, proper scrutiny of the capital works in progress and status of CWIP be made before allowing return on equity.
  - (c) The state Govt. may accept OHPC's proposal not to charge ROE in 2009-10 for the old power stations so that the power tariff to the ultimate consumer is reduced/contained.

**Interest during Construction:**

65. One objector has stated that there is no justification for including IDC in the tariff as it is not an element of cost.

**Misc. Income:**

66. Some objectors pointed out that cash discounts received from PFC on repayment of loans taken from time to time and interest received on GRIDCO bonds be included in the ARR of OHPC.

**Utilisation of Secondary Energy Reserve Fund:**

67. Some objectors pointed out that the earnings from secondary energy sale should be considered as income in the ARR as per tariff order for FY 2007-08.

**Grant received under APDP Scheme:**

68. Some objectors pointed out that the receipt of Rs. 19.0 crore for RM&U of units 3 & 4 of Burla Power House under APDP Scheme should not be treated as equity and no returns be allowed on it.

**Truing Up:**

69. Some objectors commented that there should be parity in truing up treatment. The benefits of high hydro conditions should be passed on to the consumers of Orissa by truing up of the performance of OHPC during the previous years (2003-04 to 2006-07) as it was done during FY 2002-03 to pass through the fixed cost due to low hydro conditions.

**Reservoir level & availability of power:**

70. Some of the objectors mentioned that the availability of power from State Hydro Stations for FY 2009-10 projected by OHPC is about 4960 MU whereas as per their calculation it will be about 7711 MU. This may be clarified by OHPC.

**Primary and Secondary Energy charges:**

71. One objector has submitted his views on pricing of Primary and Secondary Energy proposed by OHPC which are briefly stated as under:
- (a) OHPC should indicate whether a separate account has been maintained to keep the funds earned out of secondary energy.
  - (b) If secondary energy charges are also made equal to the primary energy charges, the consumers have to bear the cost of high capital investment for a second time.
  - (c) When two additional units are installed in BHEP, there will be a sharp increase in the primary energy charges (as there will be no increase in the design energy).
  - (d) OHPC does not have to incur any additional expenditure for generation of secondary energy.
  - (e) The primary energy charge is very high in Orissa compared to other states. OHPC may be given an incentive only for Secondary energy generation to motivate to maintain 100% machine availability during monsoon.

**Two-Part Tariff:**

72. One of the objectors requested the Commission to prescribe a two-part tariff as the concept of two-part tariff providing capacity charges and primary energy charges is a true measure of efficiency of the generating company.
73. The objector submitted that OHPC is projecting a substantial increase in tariff, taking full advantage of the cost plus principle for determination of tariff and therefore needed examination by the Commission.
74. The objector stated that even though the Commission had directed OHPC to carryout certain exercises, which have a direct bearing on the tariff, OHPC is avoiding/delaying to execute the same.
75. The capacity charges should be fixed at atleast 50% of the fixed charges to incentivise OHPC to improve availability of the machines which will also help the Generator to generate higher secondary energy. Thus there would be an element of penalty and bonus which is a very desirable scheme in fixing the tariff for OHPC.

**REJOINDER OF OHPC (Para 76 to 121)**

76. The application for approval of Annual Revenue Requirement (ARR) & Tariff for the FY 2009-10 in respect of individual Power Stations of OHPC was filed before the Hon'ble



Commission on 29.11.08. Suggestions/objections on the ARR application have been received from a number of objectors. The compliance to the suggestions / objections raised by the objectors are furnished herewith:

**Reassessment of Design Energy:**

77. Pursuant to the Commission's directive in its Order dtd.10.06.2005 in para 6.5(a), OHPC carried out the work of Reassessment of Design Energy through a consultancy agency namely M/s SPARC as per the norms prescribed by CEA on reassessment of design energy. OHPC submitted the reports to the Commission on 31.05.2008 for approval. The Commission in its letter dated 04.11.2008 observed that while the report has been prepared following the guidelines issued by the CEA in August, 2004, the Commission nevertheless desire to refer the matter to the CEA for better appraisal. The said reports were referred to CEA for its comments. M/s SPARC gave a presentation to the CEA on 17.12.2008 at CEA's Head quarters, New Delhi. The CEA has expressed that "from the presentation made by OHPC / M/s SPARC Ltd. and from perusal of the 'Reports on Re-assessment of Design Energy' of the projects furnished earlier, it is seen that the guidelines issued by CEA have been broadly followed by OHPC while carrying out the review. However, authenticity / accuracy of the various data adopted for the review may be ascertained by OERC at their end". So the Commission may take a final decision on the matter.
78. It is to be mentioned that design energy of a hydel station is not determined only on the earlier years' performance of the stations and reservoir status only. There are many other parameters like yield pattern of the basin, live storage capacity, Pan Evaporation (due to climatic change), demand for irrigation and provision for domestic and industrial uses and environmental flow, which determines the design energy of a hydro generating plant. These parameters have undergone considerable variation in the last 25 to 30 years.
79. The design energy of HPS has been computed after taking into account the commitment of Hirakud reservoir water to D&I (Domestic & Industrial). The water requirement for D&I is 616.5 Mm<sup>3</sup> ( 0.5 MAcft) based on MoUs signed for various steel plants, thermal stations and aluminum complexes up to 2006-07, as per the report submitted by M/s SPARC.
80. The water drawn by the industries from the power channel of Chiplima is not taken into consideration.
81. The design energy of RHEP has been computed after taking into account the water requirement for D&I. The water requirement for D&I is 600 Mm<sup>3</sup>, as per the report submitted by M/s SPARC.
82. The main reasons for getting a low design energy are:

- (i) Change in land use and cropping pattern in the upstream side
  - (ii) Low yield due to upstream abstraction due to interception of catchment area particularly for Hirakud reservoir.
  - (iii) Change in requirement of water for irrigation due to change in cropping pattern.
  - (iv) Requirement for D&I (Domestic and Industrial) use has been increased.
  - (v) Reduction in live storage capacity due to siltation.
  - (vi) Marginal reduction of the rainfall in the basin.
83. There will be no change in design energy due to addition of 150 MW to Balimela Power House. It has been installed to meet the peak demand of Orissa grid. Meeting peak demand will stabilize the grid and help to avoid load shedding, which is again in the interest of consumers of the state.

**Equity Component:**

84. The notification dated 29.01.2003 of Government of Orissa, DOE stipulates that GRIDCO & OHPC shall not be entitled to any ROE till the sector becomes viable on cash basis, or 2005-06 whichever is earlier. Since no further notification is issued by the State Government to this effect, ROE on the historical cost of the OHPC assets has been proposed in the ARR for the financial year 2009-10.

**Electricity Duty (ED):**

85. As per the agreed PPA between OHPC & GRIDCO, the taxes and duties including on auxiliary consumption etc payable by OHPC to the State Government and other statutory bodies shall be passed on to GRIDCO in the shape of supplementary bill raised by OHPC and GRIDCO will make payment accordingly within 3 days of receipt of bills. To facilitate reimbursement of electricity duty, GRIDCO should include the same (based on the Design Energy), in its Annual Revenue Requirement prior to beginning of the year. OHPC is of the view that ED on auxiliary consumption should be reimbursed as per actual payment to the Government of Orissa.

**Credit towards Colony Consumption:**

86. The colony loads at RHEP and BHEP consists of OHPC, Water Resource and Pvt. Consumers loads. Till date, the DISCOMS have not segregated the OHPC & non- OHPC loads. They have been regularly perused for segregation on the above loads along with the separate metering system. Then only, the OHPC consumption can be quantified and thereafter the adjustment may be done with ARR of the respective field units.

**Allocation of PPAs:**

87. OERC in Order dated 13.01.2005 on the case No. 88/2004 has approved the PPA between OHPC and GRIDCO for power purchase from RHEP. Regarding allocation of

PPAs to the Distribution Companies, the Commission has the authority to take suitable decision on the matter.

**Separate PPA for Hirakud and Chiplima:**

88. At present there is no such proposal for separate PPA for Hirakud and Chiplima. However, OHPC accepts the advice of objectors in this regard.

**Prospective Plan for Hydro Development:**

89. There is no such plan to develop alternative power channel for Chiplima power house. However, it has been proposed to install an automatic trash cleaning machine at the existing trash rack of all the units of Chiplima power house. The offers for the same are under evaluation. Further the possibility of complete dredging of power channel and the ponds is being explored. Till that happens, regular weed cutting and disposal is undertaken by M/s IDCO.
90. Members of Board of Directors of OHPC during 32<sup>nd</sup> meeting held on 09.06.2000 advised to withhold the implementation of Hirakud-B and Chiplima-B due to high cost of generation as per the DPR prepared by WAPCOS and considering the economic scenario at that time. At present there is no proposal of OHPC to take up the said projects.
91. At present OHPC is in the final stage for preparation of revised DPR for SINDOL-1 (Deogaon H.E. Project) engaging WAPCOS as consultant.
92. Development of pump storage and river link projects at different locations in Orissa are under scrutiny of the Department of Water Resources and the decision will be taken by the Inter-Departmental Co-ordination Committee constituted by Govt .of Orissa..
93. For development of New H.E. Projects “Interdepartmental Technical Co-ordination Committee” with the members from WR Department and Energy Department has been constituted by Government of Orissa to sort out the issue relating to development of New projects. The nine nos. of newly identified projects are as follows:
- (1) Middle Kobal H.E. Project
  - (2) Tel Integrated Project
  - (3) Lower Vansadhara Project
  - (4) Balijori H.E. Project
  - (5) Salki H.E. Project
  - (6) Khadago Dam Project
  - (7) Uttel-Roul Integrated Project
  - (8) Mahanadi- Bramhani River link
  - (9) Barmul Hydel Project

**Capital Cost of Upper Indravati Hydro-electric Project:**

94. After long discussions and deliberations on the project cost of UIHEP during the hearing for tariff application for 2007-08, the Commission in its order dated 22.03.2007, have

approved Rs. 1195.42 crore as the final capital cost of UIHEP (600 MW capacity) for the purpose of determination of tariff. The tariff proposal of UIHEP is based on this approved capital cost. The issue should not be reopened again and again.

**Balimela Extension:**

95. The 7<sup>th</sup> & 8<sup>th</sup> units of BHEP have commissioned on 25.01.2008 & 13.05.2008 respectively. Around 145.148 MU has been supplied to the grid during trial operation as infirm power. The 7<sup>th</sup> & 8<sup>th</sup> units have been put into commercial operation on 23.12.2008 and 23.01.2009 respectively. Return on equity on account of capitalization of these Units has already been claimed in the financial year 2007-08 and 2008-09. The existing CERC regulation provides that Return on Equity shall be computed on the equity base determined in accordance with regulation 36 and shall be @ 14% per annum. Based on the notification of Government of Orissa dated 29.01.2003, the return on equity for the year 2004-05 was allowed to OHPC on new investments only after 01.04.1996. Hence, OHPC may be allowed ROE on new investment made after 01.04.1996.

**R & M of Unit II of Chiplima Power House:**

96. Unit-II of Chiplima Power House was put on commercial operation on 27.03.2008 after completion of R&M. The capital expenditure of Rs. 23.77 crore has to be capitalized in the financial year 2008-09. The expenditure made in the said R&M work is reflected in the Annual Account of 2007-08.

**Functioning of OHPC:**

97. Regarding management and functioning of OHPC in rented house, OHPC has no comments as it has no relation in determination of hydro tariff.
98. There is no such shutdown of HPS Burla & Chiplima due to alleged mismanagement as narrated by an objector. However, the planned and forced shut downs of Hirakud and Chiplima Power House of OHPC for 2007-08 are given below.

**Table-8**

(in Hours)

Sl. No.	HPS Burla							Chiplima		
	Unit-1	Unit-2	Unit-3	Unit-4	Unit-5	Unit-6	Unit-7	Unit-1	Unit-2	Unit-3
Planned outage	613.10	1120.3	8.00	3.50	5006.45	1447.00	6.35	430.29	8784	0.00
Forced outage	509.35	9957.0	831.42	294.15	20.30	16.49	162.35	257.43	0.00	8784

**O & M Expenses:**

99. Additional estimated expenses towards wage revision has been included in O&M expenses.

100. Infrastructure development is for creating a healthy living atmosphere around the power house and the colony for the employees. There should be provisions in the ARR to this effect. The Commission may kindly consider the same for all generating stations.
101. Renovations of switchyard of Chiplima Power House at a cost of Rs. 2.50 crore is a major repair work and expenditure could not be met from the normal O&M expenses in ARR. There is an urgent need to renovate the switchyard which is more than 50 years old. At present, it has been proposed to install an automatic trash cleaning machine at the existing trash rack of all the units of Chiplima power house. The offers for the same are under evaluation.
102. The Commission in the tariff order for financial year 2008-09 allowed Rs.1 crore for purchase of turbine blade of RHEP and also advised to consider the balance Rs.2 crore in the financial year 2009-10.
103. Similarly, the Commission in tariff order for FY 2008-09 has allowed Rs. 7 crore towards major repair of governor and excitation system of UIHEP machines and balance Rs. 7 crore is to be considered in the financial year 2009-10.
104. O & M expenses has been computed based on the OERC and CERC guidelines taking into account the audited figures of 2007-08 and escalated @ 4% per annum. The suggestion of the objectors for taking into consideration the O&M expenses of 2008-09 for determining tariff of FY 2009-10 is not feasible as the audited figure of 2008-09 will be available only in the middle of FY 2009-10.
105. The increase in O&M expenses is due to provision for salary enhancement for current year and arrear salary from 01.01.2006 on the proposed implementation of 6<sup>th</sup> pay Commission recommendations. The contribution to O&M expenses due to pay revision has already been enunciated in the application.

**Depreciation:**

106. In case of Rengali and Upper Kolab depreciation of Rs.2.41 crore and Rs.2.89 crore respectively has been considered @ 2.57% on original cost of assets as on 01.04.1996 and additions made thereafter. For other power houses actual loan repayment to be made has been considered. The details of principal loan repayment to be made in the financial year 2009-10 is given below.

**Table-9**

**(Rs. in Crore)**

Units	Govt. Loan	PFC Loan	Deemed Loan	Total
RHEP	1.05	---	---	1.05
UKHEP	1.25	----		1.25
BHEP	0.95	9.60	3.00	13.55
HPS	0.64	6.52	5.34	12.50
UIHEP	---	32.08	----	32.08
Total	3.89	48.20	8.34	60.43

107. The audited annual report of OHPC for FY 2007-08 has already been submitted to the Commission on 27.12.2008.

**Interest on Working Capital:**

108. A prudent commercial organization need working capital to run day to day affair of the company as the sales proceeds can only be realized on placing bill on GRIDCO after the completion of a month. Therefore, interest on working capital as per the guidelines of CERC and OERC norms is followed by OHPC in calculation of Tariff. However, OHPC accepts the proposal as suggested by M/s GRIDCO of SBI PLR @ 12.25%.
109. Profit of OHPC is mainly due to sale of secondary energy and availability of machines above normative plant availability factor (NPAF) i.e. 85%. The realization from sale of secondary energy is not guaranteed in forthcoming years. Further, as far as part of profit for utilization in working capital is concerned, there is huge outstanding against GRIDCO till date, as such there is no availability of cash on that account.

**Interest on Loan:**

110. Interest on loans relating to projects is as per the norms and allowed to all other generators which may not be denied to OHPC. In earlier years, interest on deemed loan have been allowed in the tariff by the Commission.

**Return on Equity:**

111. As per OERC norms, return on equity @ 14% is being allowed to all generators who supply power to GRIDCO. Since OHPC is one among them & supplying power to GRIDCO should not be debarred from claiming return on equity @ 14% both on original cost and additions made thereafter.

**Interest during Construction:**

112. In response to the objection regarding interest during construction, OHPC replied that the Commission might decide this.

**Misc. Income:**

113. Some objectors pointed out that cash discounts received from PFC on repayment of loans taken from time to time and interest received on GRIDCO bonds be included in the ARR of OHPC. Miscellaneous income is small non-recurring income & mostly related to the prudential cost management. Such income does not find place in the CERC norms and therefore, is not considered in tariff.

**Utilisation of Secondary Energy Reserve Fund:**

114. The Commission in its Order dated 22.10.2005 in case no. 38 of 2005 clarified that “the revenue earned out of the sale of secondary energy may remain part of normal fund of OHPC but shall be utilized to replenish the shortfall in revenue due to less generation by

OHPC in years of hydrological failure to provide necessary comfort to the consumers of the state.” Due to huge outstanding against GRIDCO, there is no inflow of funds on account of sale of secondary energy during the past years.

**Grant received under APDP Scheme:**

115. The state Government has not yet changed the nature of Rs. 19 crore equity to grant.

**Truing Up:**

116. As per the existing guidelines, ARR is recovered through tariff on the generation up to design energy of the power station. The earning from generation of secondary energy shall be utilized to replenish the shortfall in revenue during year of hydrological failure. However, no compensation has been given to OHPC in the years of hydrology failure except in case of UIHEP for the year 2002-03. In the absence of any definite norms for revenue adjustment, the truing up treatment may not be applicable to hydro power stations of OHPC.

**Reservoir level & availability of power:**

117. As required by the objectors, the reservoir levels of OHPC power stations as on 01.11.2006 and 01.11.2007 and the actual generation from April 2007 to October 2007 are given below:

**Table-10**

<b>Name of the power station</b>	<b>Reservoir level as on 01.11.2006</b>	<b>Reservoir level as on 01.11.2007</b>	<b>Actual generation from April'07 to October'07 (in MU)</b>
HPS	627.65	627.39	745.941
BHEP	1512.50	1513.80	1104.015
RHEP	122.44	120.98	753.772
UKHEP	856.17	856.06	706.793
UIHEP	640.94	640.45	1878.756

**Primary and Secondary Energy charges:**

118. The issue of pricing of secondary energy has been discussed adequately in CERC tariff guidelines. The Commission in its tariff orders, of the previous years (in para 5.4.7 for 2007-08, in para 129 for 2008-09) have clarified that the rate of secondary energy shall be equal to the rate of primary energy. In order to encourage growth of hydro power, secondary energy charges should be priced at the same rate as applicable to the primary energy.
119. The primary energy charges are decided by the Commission based on the primary energy rate i.e. the lowest variable cost of the central sector thermal power stations of the region.

**Machhkund:**

120. The design energy of Machhkund Power Station as per the project report is 525 MU. As per the interstate agreement between Government of Orissa and Government of Andhra Pradesh, Orissa has 30% share in the O&M cost, and the State is entitled to draw up to 50% of design energy i.e. 262.5 MU. So, the question of taking project drawal of 342 MU is unjustified.

**Potteru Small H.E. Project**

121. An amount of Rs. 36,28,02,850/- has been spent upto 31.03.2008 (audited) for Potteru Small H.E. Project. Power House-1 of PSHEP was run and loaded up to 700 KW from 07.01.2008 to 12.01.2008.

**REPLY TO QUERIES RAISED BY THE DIRECTOR (TARIFF) AT THE HEARING ON 02.02.2009 (Para 122 to 148)**

122. The reply of OHPC to the issues raised by the Director (Tariff) during hearing on 02.02.2009 is summarized below:

**PPA for OHPC Old Power Stations:**

123. On the query related to finalization of PPAs for old power stations, OHPC replied that the long term PPA for old Power Stations of OHPC with the agreed changes / modification have been sent to GRIDCO for its opinion. GRIDCO has submitted its comments on invoice and payment clauses and the same was discussed to clarify the matter. Besides that some points regarding operational parameters of high head power stations are to be discussed and finalised. OHPC is in the process of finalization and submission of PPAs to the Commission.

**Status of Potteru Small Hydro Project:**

124. The construction of PSHEP (2x3 MW) with design energy 43.58 MU (2 x 21.79 MU) had started in June, 1993 by the then Irrigation Wing of I&P Department after approval from different agencies and available funding. Civil works of both Power Houses came to stand still for about 4 years due to law and order problems and completed in March, 2002. After getting clearance from WR department, spinning of both power houses was done on 30.06.2002.
125. Machine of P.H – I could not run continuously due to problem in governing system. During June, 2002 to December, 2007, the following major problems have occurred at different dates.
- (i) Problem in turbine guide vane and governing system.
  - (ii) Breach of canal and weed problem.
  - (iii) Drop of water level (Head) on loading the machine beyond 1.2MW.



- (iv) Disturbance due to antisocial elements.
- (v) Flood in that area.
- (vi) Damage of equipment due to fire.
- (vii) Evacuation problem in synchronization mode to SOUTHCO and there is load restriction in radial mode. (1.2 MW max.)

However, machine has been run successfully from 07.01.2008 and loaded up to 700 KW radially on 12.01.2008.

126. The machine of Power House-II was closed immediately due to heavy leakage in fore bay dam. As decided by the OHPC Board, the rectification work shall be taken up after successful operation of PH-I.
127. Present operational condition:
- (a) Taking into account different seasonal crops, DOWR can release water for 210 days in a year for 8 to 10 cumecs. Considering this, PH-I can be run at 800 KW to 1000 KW for 210 days and 10 hours per day. In this way, PH-I can generate 21,00,000 KWh annually by which, @ 2.50 the average monthly revenue realization is maximum of Rs.4,37,500. The monthly average generation is 1,75,000 Kwh.
  - (b) Against the EOI invited by OHPC, two firms have shown interest to run the PH-I on tariff based bid. It is under scrutiny. One firm has quoted Rs.2.43/unit with monthly minimum price Rs.10,15,000/- and other firm has quoted Rs.6.00/ unit with mobilization charge as extra (not mentioned).
  - (c) MOM is signed with the CEO, SOUTHCO on 27.01.2009 for evacuation of power from PH-I of PSHEP on isolated mode.
  - (d) M/s Best & Crompton have been asked to attend the commissioning activities including completion of balance of work.
  - (e) WR department has been also requested to maintain water supply for generation of power.
128. The original estimate prepared in 1982 for Rs.546 lakhs has increased to 2883 lakhs in the year 2003. Total expenditure is around 36.00 Crore as on 31.03.2008 including interest during construction. Further, investment of about 300 lakhs is required to complete the works such as 33KV line construction, fore bay dam repair (PH-II), Forest Clearance, motorized operation of stop log gate etc.

#### **Machkund HE (Jt.) Project**

129. Central Electricity Authority has already accorded Techno Economic Clearance in April, 2001 for R, M & U of Machkund Hydro Electric (Jt.) Project at an estimated cost of

Rs.124.45 Crore. Govt. of Orissa has also agreed that the Project execution may be done by APGENCO and has agreed to share 50% of the Project cost with share of rights. Before taking up R & M of Machhkund Hydro Electric (Jt.) Project, it is necessary for Govt. of Orissa and Govt. Of Andhra Pradesh to enter into a formal agreement necessitating modification of Inter-State Agreement of 1946 and 1978.

130. Accordingly, the Chief Engineer, Electricity of APGENCO, Andhra Pradesh has submitted the draft modified agreement in accordance with the minutes of high level meeting held at Hyderabad on 03.03.2008 between the delegates of Govt. of Andhra Pradesh and Govt. of Orissa on Machhkund H. E. (Jt.) Project vide his letter No. 212 dated 30.07.2008 for according concurrence at OHPC end. In response, OHPC has forwarded the above draft agreement incorporating its views to the Deptt. of Energy, Govt. of Orissa.
131. Deptt. of Energy, Govt. of Orissa has forwarded the above draft agreement incorporating its views to the Deptt. of Energy, Govt. of AP for their acceptance and communication of the same. On receipt of their views, a suitable date will be fixed by DOE, Govt. of Orissa for execution of the agreement in consultation with them, vide letter No. 12482 dated 05.12.2008 of DOE, Govt. of Orissa.

#### **Application of new CERC Tariff Regulations**

132. The station-wise ARR of OHPC for the FY 2009-10 with different components applying the norms as per new CERC Tariff Regulations, 2009 are given in the table below :

**Table-11**

(Rs. in Crore)

<b>Particulars</b>	<b>HPS</b>	<b>BHEP</b>	<b>RHEP</b>	<b>UKHEP</b>	<b>UIHEP</b>
Interest on Loan	7.06	10.81	0.31	0.37	2.88
Depreciation	18.88	14.16	4.46	5.34	56.78
Return on Equity	17.37	14.62	4.13	4.94	52.22
O & M Expenses	57.83	38.46	37.58	26.53	70.97
Interest on working capital	4.20	3.06	2.29	1.73	5.20
ED on Aux. Consumption @20 P/U	0.10	0.09	0.07	0.06	0.17
Interest during construction	1.10	1.35	0.74	1.23	0.00
<b>Total ARR / AFC</b>	<b>106.54</b>	<b>82.54</b>	<b>49.57</b>	<b>40.20</b>	<b>188.21</b>
<b>Average Tariff (P/U)</b>	<b>112.40</b>	<b>89.79</b>	<b>74.73</b>	<b>63.06</b>	<b>111.58</b>

133. In the above calculation, interest on loan capital has been calculated as per the actual rate of interest of individual loans and the deemed loans at PLR of SBI ie. @ 12.25%.
134. Depreciation has been calculated at the rate of 5.28% as per new CERC norms.

135. Return on equity has been computed on pre-tax basis at the base rate of 15.5% to be grossed up with the normal tax rate for the year 2008-09. The Minimum Alternate Tax (MAT) applicable to OHPC for the FY 2008-09 is @ 11.33% including surcharge and cess. ROE is thus calculated @ 17.481% [i.e.,  $15.50 / (1 - 0.1133)$ ].
136. Working capital includes Receivables equivalent to two months of fixed cost, Operation and maintenance expenses for one month, and Maintenance spares @ 15% of operation and maintenance expenses. The rate of interest on working capital shall be equal to SBI short term PLR as on 1.04.2009. SBI PLR of 12.25% has been considered as existed in Dec'08.
137. Operation and Maintenance expenses for the year 2009-10 has been calculated with 50% hike in employee cost on account of pay revision of the employees as per the norms in new CERC Tariff Regulations. Further, some additions have been made as was proposed in the ARR application. The O&M expenses of each power station are given bellow.

**Table-12**  
**Operation and Maintenance Expenses**

(Rs. in Crore)

Sl. No.	Particulars	HPS	BHEP	RHEP	UKHEP	UIHEP
1.	O&M expenses for FY 2009-10 with salary hike	41.69	29.19	22.94	15.65	44.08
2.	Major repair of machines, switchyard renovation and trash rack replacement.	4.00*	-	3.42 <sup>#</sup>	0.70 <sup>\$</sup>	8.00**
3.	Proposed infrastructure development(own colony and power houses premises)	1.00	1.00	1.00	1.00	1.00
4.	Arrear salary	11.14	8.27	10.22	9.18	17.89
<b>TOTAL(items 1+2+3+4)</b>		<b>57.83</b>	<b>38.46</b>	<b>37.58</b>	<b>26.53</b>	<b>70.97</b>

138. Further, interest during construction @ 13% i.e. the short term PLR of SBI have been considered for some capital works to be taken up in the FY 2009-10 in respect of each power station. The works will be taken into capital account after completion of work.
139. Electricity duty of Auxiliary consumption @ 20 paise/Kwh limited to 0.5% of the Design energy of each power station has been considered for calculation of ARR for the FY 2009-10.
140. The average tariff for individual power stations based on existing design energy and revised design energy are given below:

**Table-13**  
**Average Tariff**

<b>Name of the power station</b>	<b>Annual fixed cost (Rs. in crore)</b>	<b>Tariff based on existing design energy (Paise/KWh)</b>	<b>Tariff based on revised design energy (Paise/KWh)</b>
HPS	106.54	91.69	112.40
BHEP	82.54	70.50	89.79
RHEP	49.57	95.34	74.73
UKHEP	40.20	48.83	63.06
UIHEP	188.21	96.91	111.58
Total	467.06	83.11	96.21

**Recovery of Annual Fixed Cost (AFC)**

141. As per new CERC Regulations, the annual fixed cost of hydro generating stations shall be recovered on the basis of 50% from energy charge and 50% from capacity charge. But OHPC is of the view that such apportioning may be changed according to operational parameters and constraints on operation of different power houses of OHPC due to restrictions which are beyond the control of OHPC.
142. The annual fixed charges of the hydro generating stations shall comprise of Capacity Charge and Energy Charge and shall be computed as per the formula provided in Regulation 22 of new CERC Tariff Regulations.

**Tax on income:**

143. As per new CERC Regulations tax on the income streams of the generating company shall not be recovered from the beneficiaries provided that the deferred tax liability, excluding fringe benefit tax for the period up to 31.03.2009 shall be recoverable directly from the beneficiaries and the long term customers. So OHPC, may be allowed to recover deferred tax liability excluding fringe benefit tax from GRIDCO.

**Salary and Arrear Calculation**

144. Arrear salary estimation on account of probable implementation of Sixth Pay Commission's recommendation for employees of OHPC has been furnished to the Commission. There exists a difference in no. of employees as calculated in the arrear salary and the total employee list of OHPC as the employees of Machhkund were not considered, and the salary liability of Machhkund employees will be borne by APGENCO.

**Normative Annual Plant Availability Factor (NAPAF):**

145. As per the new CERC Regulations Normative Annual Plant Availability for hydro generating stations shall be determined by the Commission taking into account different criteria such as head variation between Full Reservoir Level (FRL) & Minimum Draw-

Down Level (MDDL), abnormal silt problems, other operating conditions and known plant limitations etc. Accordingly, OHPC has computed the plant availability factor of its different projects as given below:

**Table-14**  
**Normative Annual Plant Availability Factor (%)**

<b>Name of the power stations</b>	<b>NAPAF (%) considering head variation between FRL &amp; MDDL</b>	<b>NAPAF (%) after considering an Allowance of 5% due to operating conditions and known plant limitations</b>
<b>HPS (for different type of machines)</b>	84.53	80.30
	85.53	81.25
	90.00	85.50
<b>Rengali</b>	78.30	74.38
<b>Upper Kolab</b>	89.79	85.30
<b>Balimela</b>	89.01	84.55
<b>Upper Indravati</b>	90.00	85.50
<b>Chiplima</b>	55.00	-

**Submission of tax rate**

146. The tax rate applicable to M/s OHPC for the assessment year 2008-09 and 2009-10 is MAT and it is @ 11.33% P.A. Advance tax for an amount of Rs. 4,31,39,293 has been deposited. OHPC also has deposited Rs. 12,13,23,145 through challan deposit. The total amount comes out to Rs. 16,44,62,432. In the ARR application OHPC had furnished Rs. 15.51 crore as Income Tax. The balance amount shall be recovered from Tax department due to excess deposit of advance tax.

**Action Plan on the Recommendations of the Enquiry Team**

147. The detailed action plan in respect of compliance to the suggestions/ recommendations / observations made by the Enquiry Team formed by the Commission has been submitted vide this office letter No. 616 Dt: 24.01.2009.

**Outstanding against GRIDCO**

148. The total outstanding position of GRIDCO as on January is Rs.381.54 crore

**VIEWS OF GOVERNMENT OF ORISSA**

149. While responding to different issues having bearing on fixation of retail tariff of electricity for the year 2009-10, as communicated by the Commission in its letter No.2807 dtd.31.12.08, Govt. of Orissa vide their letter No.R&R-II-1/2009 dtd.17.02.09 has submitted its views which is indicated below:

- i) Govt. is taking active steps to make all the 34 Energy Police Stations including 29 new ones by deploying requisite staff. Posting of a Senior Police Officer in the rank of Addl. D.G./I.G. to oversee the function of the Energy Policy Stations will be decided soon.

- ii) State Govt. has already taken in-principle decision to provide capital investment of Rs.100 Crore to OPTCL in the form of share capital over a period of 3 years from 2008-09. Regarding strengthening 220/33 kV lines and replacement of grid stations in the inaccessible and unremunerative areas. A provision of Rs.5 Crore has already been proposed in the budget of FY 2009-10. OPTCL and OHPC have been allowed to fill up the vacant posts in level of Asst. Managers, Junior Managers and ITI passed non-executives.
  - iii) Govt. will not provide any subsidy to the DISCOMs as per Sec.65 of Electricity Act, 2003 on account of revenue loss incurred by them for supplying power to the BPL families. It is stated that BPL families may be asked to pay their electricity dues as per their consumption like ordinary consumers.
  - iv) The upvaluation of assets of GRIDCO/OPTCL and OHPC should be kept in abeyance from 2006-07 to 2010-11. RoE of GRIDCO and OHPC should also be freeze for the similar period.
  - v) Revised small/micro hydel policy has already been formalized. Two small hydro projects namely Middle Kolab and Orissa Power Consortium are expected to go for generation in the coming fiscal. Govt. has been making effort to leverage renewable energy sources through OREDA.
  - vi) Different Depts. including Energy Dept. and Finance Dept. have issued instructions to subordinate offices/PSUs/ULBs and Cooperatives to clear their electricity dues.
  - vii) In the matter of tariff hike for 2009-10 Government are of the views that their should be no tariff hike in 2009-10.
150. Regarding subsidy/subvention, Govt. of Orissa vide their letter No.R&R-II-1/2009/2329 dtd.28.02.09 has communicated to the Commission that Govt. of Orissa is reconsidering the aspect of providing subsidy to the power sector for year 2009-10. The decision of the Govt. in the matter would be intimated shortly.

**OBSERVATION OF THE STATE ADVISORY COMMITTEE (SAC) (Para 151 to 156)**

151. The State Advisory Committee (SAC) constituted under Section 87 of Electricity Act, 2003 met on 12, Feb 2009 to deliberate on the Annual revenue requirement and tariff application for the FY 2009-10 of utilities, namely OHPC, OPTCL, GRIDCO, SLDC, CESU, NESCO, SOUTHCO and WESCO.
152. The Director (Tariff) made a brief presentation on the ARR and tariff applications for FY 2009-10 of the above mentioned utilities. Members in general expressed their concern over the poor performance of the licensees particularly on distribution loss, poor consumer services and lack of investment etc.
153. Opening discussion on OHPC the members expressed their concern on the reduction of design energy by OHPC in spite of large amount of capital investment resulting in the

upward rise of generation cost. OHPC has projected revised design energy which is substantially lower than the original design energy. Against the design energy for sale approved by the OERC for 2008-09 at 5884.9 MU, OHPC is now showing the revised design energy for sale for 2009-10 at 5117.08 MU, the reduction being 764.66 MU. The Commission should give a very critical and serious look to the proposed revised design energy submitted by the OHPC.

154. OHPC should not be allowed additional capital expenditure unless design energy is improved.
155. When the water level during the current year remains more or less same as the corresponding month of previous financial year, it is not understood how there has been less generation of hydro power during the year 2008-09. However, for meeting the likely production of hydro power the requirement of water for industrial purposes and irrigation purposes have to be taken into account.
156. In complying with the views of the members of the SAC, OHPC had stated that in the last three years the efficiency of OHPC has increased. However, in the current year 2008-09 rainfall was around 30% less and reservoir levels has been depleted. By close coordination with SLDC till June, 2008, OHPC could remain at par with Hydro Power production of 2006-07. Now, the utility is being approached by National Companies for joint ventures. Regarding design energy verses capital expenditure, there are two measure factors which are responsible for proposed rise in tariff :
  - a) The revised design energy has been worked out by an independent agency engaged by OHPC as per the recommendation of OERC.
  - b) Impact of salary hike as per the recommendations of the Sixth Pay Commission.

The vacancy level in OHPC is now at 30%. In the meantime the Govt. has allowed for filing up the vacant posts.

#### **COMMISSION'S OBSERVATIONS AND ANALYSIS OF OHPC'S PROPOSAL (PARA 157 TO 206)**

157. The Commission is duty bound by statute to fix tariff for a generating company in respect of its supply of power to distribution licensees vide Section-62 (1)(a) of the Act. The generating company, for this purpose, is legally liable to file its ARR & tariff application. The tariff so determined would apply where a DISCOM purchases power directly from OHPC. The question that arises is whether the tariff so fixed is applicable when GRIDCO, a trader, purchases power form OHPC for the sole purpose of supplying to some DISCOMs under a contractual obligation. This is essentially a question of extended applicability of the tariff set by the Commission and not a question of power of the Commission to set tariff for generating companies supplying electricity to DISCOMs.

The question is whether applicability of the tariff so determined by the Commission can, in the special circumstances of a single-buyer model prevailing now, extend to a trader who under a contractual arrangement buys power from the generating company to the exclusion of all other buyers and sells power to only specified DISCOMs, and none others, so long as the requirement of such specified DISCOMs remains unfulfilled. Had there been no such contractual arrangement (PPAs and BSAs), the tariff determined by the Commission would not apply. But when such contractual arrangement exists, if the Commission does not apply this tariff, in respect of sales to GRIDCO, it would amount to allowing DISCOMs to obtain power at a price different from this tariff. DISCOMs would thus be circumventing this tariff. They would also be departing from the procurement price fixed by the Commission under law [Section-86(1)(b)] in the context of a single-buyer model. For this reason in these special circumstances of a single-buyer model which exists as a fact, a rate based on the tariff fixed for generating company qua DISCOMs has been thought necessary to be applied to purchases by GRIDCO functioning as the sole trader. Indeed GRIDCO is for the time being a single conduit for supply of power by the generating company to DISCOMs, such that in effect and substance the generating company is supplying power to DISCOMs. DISCOMs must not be free to depart from the Tariff set for supplies to them, by a generating company merely by reason of the technicality of the conduit of supply being a trader. The single-buyer model as prevailing in the State of Orissa is not repugnant to any provision of the Electricity Act, 2003. But if tariff determined by the Commission is not made applicable to the single-buyer it would frustrate the object of Section-62(1)(a) of the Act. It could not be the intention of the legislature that where the single-buyer model prevails the sale of power to DISCOMs should escape the tariff regime. Accordingly the tariff determined by the Commission shall be applicable for sale of power by OHPC to GRIDCO.

158. The Commission has thoroughly examined and analysed the proposal of OHPC. The written and oral submissions of the objectors have been considered while deciding the various parameters for determining tariff. The tariff proposal of OHPC contains technical parameters such as type of hydro stations, capacity index, potential of energy generation and financial details like loans, capital cost, calculation of depreciation, interest etc. OHPC has furnished the technical and financial details in respect of each of the old power stations as well as of UIHEP. The station-wise apportionment of capital cost in respect of all these stations has also been provided along with tariff calculations.
159. During the course of public hearing, the objectors had raised certain issues having direct impact on tariff of OHPC. Issue-wise response were submitted by OHPC. Commission's analysis to the following pertinent issues related to tariff of OHPC are discussed as under:



- Review of Design Energy
- Status of Individual Station-wise PPAs
- Power Procurement from OHPC
- Capital cost of UIHEP
- Annual Fixed Cost which shall consist of
  - (i) Interest on loan capital
  - (ii) Depreciation
  - (iii) Return on Equity
  - (iv) Operation and Maintenance Expenses
  - (v) Interest on working capital
- Income Tax
- Electricity Duty
- Two-part Tariff (Capacity Charge & Energy Charge)
- Treatment of Revenue Earned from Excess Generation
- Normative Annual Plant Availability Factor (NAPAF)
- Machkund Hydro Electric Project
- Perspective Hydro Development in the State
- Renovation and Modernization

**Review of Design Energy:**

160. As per the directives given by the Commission in its order dtd. 10.06.2005 at Para 6.5, which states that ‘the reassessment should be done by appointing an independent group of Consultants under the auspices of this Commission before November, 2005, OHPC has taken steps for reassessment of design energy. An independent consultancy agency M/s SPARC was awarded the job of reassessment of Design Energy. The Commission has regularly monitored the progress in respect of reassessment of design energy. After completion of the job by M/s SPARC, the Commission directed OHPC to make a detailed presentation on 19.01.2008 regarding the matter. Thereafter, the Commission in its Order dtd. 20.03.2008 gave a directive to OHPC as follows: “OHPC shall file the *Final Report on determination of design energy of its power stations duly vested by OHPC Board.*” Accordingly, OHPC submitted the reports to the Commission on 31.05.2008 for approval. Thereafter, the Commission requested CEA to review and communicate their comments and suggestions on the said Reports to facilitate approval of the same, since the revised design energy has got bearing on hydro tariff of the State. CEA suggested that OHPC and the consultants (M/s SPARC Ltd.) should make a

presentation with regard to the proposal/methodology adopted for review of design energy. A presentation was made by M/s SPARC before CEA in the presence of OHPC and OERC officials. CEA has made the following observations:

“From the presentation made by OHPC/ M/s SPARC Ltd. and from perusal of the ‘Reports on Re-assessment of Design Energy’ of the OHPC projects furnished earlier, it is seen that the guidelines issued by CEA have been broadly followed by OHPC while carrying out the review. However, authenticity/accuracy of the various data adopted for the review may be ascertained by OERC at their end.”

161. Many objectors have vehemently opposed to the proposal of OHPC for reduction of design energy from 5676 MU to 4903.63 MU. They pointed out that the so-called revision of design energy is alarming and the generation by OHPC stations during the recent years has been much higher than that proposed for FY 2009-10. As re-determination of design energy of the existing HEPs under OHPC has important bearing on determination of retail tariff, the objectors requested the Commission to finalize the revised Design Energy only after conducting a public hearing inviting all stakeholders.
162. The Commission feels that the finalization of design energy through the process of public hearing would require time. Authentication of data used by M/s SPARC is to be ascertained as suggested by CEA and this would also require adequate time and manpower. In view of this, the Commission decided to adopt the existing level of design energy for sale at 5619.24 MU including Indravati for the year 2009-10 and the proposal of revised design energy by OHPC shall be taken up by the Commission later.

**Status of Individual Station-wise PPA:**

163. The Commission wanted to know the status of separate PPAs for each of the power stations of OHPC. In its reply, OHPC has submitted that the long term PPAs for old Power Stations of OHPC with the agreed changes / modifications have been sent to GRIDCO for its opinion. GRIDCO has submitted its comments on invoice and payment clauses and the same was discussed to clarify the matter. Besides, some points regarding operational parameters of high head power stations are to be discussed and finalised. OHPC is in the process of finalization and submission of PPAs to the Commission.
164. Some objectors had raised the issue of separate PPA for Hirakud & Chiplima Power Stations to which OHPC has replied that at present there is no such proposal for separate PPA for Hirakud and Chiplima. However, OHPC accepts the advice of objectors in this regard. The Commission observes that OHPC should make all efforts to present separate PPAs for Burla and Chiplima and present separate tariff filing for Burla and Chiplima from FY 2010-11 onwards.

### Power Procurement from OHPC

165. The installed capacity of various Hydro Stations owned by Orissa Hydro Power Corporation (OHPC) is 2062 MW as on 1<sup>st</sup> of April 2009 including Orissa share of Machhkund. The details of drawal approved by the Commission for 2008-09 and the projections made by GRIDCO for 2009-10 are presented in the following table:

**Table - 15**  
**Hydro Drawal and Projections For 2009-10**

Sl. No.	Name of the HE Project	Installed Capacity (MW)	Design Energy (MU)	Commission's Approval for 2008-09 (MU)	Proposed Drawl by GRIDCO for 2009-10 (MU)
1	Hirakud (Burla & Chiplima)	347.50	1174.00	1162.26	1132.79
2.	Balimela	510	1183.00	1171.17	1171.17
3.	Rengali	250	525.00	519.75	817.74
4.	Upper Kolab	320	832.00	823.68	826.65
	<b>Total (Old Stations)</b>	<b>1427.50</b>	<b>3714.00</b>	<b>3676.86</b>	<b>3948.35</b>
5.	UIHEP	600	1962.00	1942.38	1971.09
6.	<b>Machhkund (Orissa Share)</b>	34.50	<b>262.50</b>	<b>265.00</b>	<b>265.00</b>
	<b>Total Hydro</b>	<b>2062</b>	<b>5938.50</b>	<b>5884.24</b>	<b>6184.44</b>

166. In accordance with Section 61(a) of the Electricity Act, 2003, the Commission is to be guided by the principles and methodologies specified by the CERC for determination of tariff applicable to generating companies. The new CERC (Terms & Conditions of Tariff) Regulations, 2009 has already been notified on 19.01.2009 which shall come into force w.e.f. 01.04.2009 and shall remain in force for a period of five years from the date of commencement.
167. Auxiliary energy consumption for surface hydro electric power generating stations with static excitation system is to be determined at 0.5% of energy generated and transformation loss from generation voltage to transmission voltage is to be calculated at 0.5% of energy generated. Accordingly, energy sent out from the generating stations in respect of OHPC should be determined deducting 1% on gross generation treating 0.5% towards auxiliary consumption and 0.5% towards transformation loss.
168. As indicated in the above table, the annual energy generated by OHPC's old stations, in a year of normal hydrology, is 3714 MU. After deduction of auxiliary consumption and transformation loss, energy sent out to GRIDCO comes to 3676.86 MU. In case of UIHEP, the design energy is 1962.00 MU. After deduction of auxiliary consumption and transformation loss, energy sent out to GRIDCO comes to 1942.38 MU.
169. OHPC has furnished a tentative monthly generation programme for its different units. The same has also been furnished by OHPC to GRIDCO in regard to generation during 2009-10. GRIDCO has projected the power purchase from OHPC stations based on the

latest generation plan submitted by OHPC for different stations. GRIDCO has considered 6184.44 MU of availability from OHPC hydro stations as per this generation plan after deduction of 16.60 MU of allocations to CSEB from Hirakud Power Station and 0.5% auxiliary consumption and 0.5% transformation loss.

170. As indicated earlier, the design energy of OHPC old stations in a year of normal hydrology being 3676.86 MU, it is premature to predict the rainfall at this point of time. The Commission cannot accept a figure exceeding 7000 MU as suggested by some of the objectors as generation shall depend on rainfall, MDDL of the reservoir and water use by other agencies. Acceptance of such a high figure would mean reduced drawal from high cost energy sources, which in turn would affect the power purchase cost in case of reduced hydro generation. As such, the Commission considers it appropriate to accept and approve a figure of 3948.35 MU as energy available from these stations and 1971.09 MU in case of UIHEP for the year 2009-10.

#### **Machhkund**

171. This hydro power station is a joint venture of Government of Orissa and Andhra Pradesh with an installed capacity of 114.5 MW. Based on the 50% share of GRIDCO the quantity comes to 262.50 MU. GRIDCO has projected drawl of 265 MU for the FY 2009-10. The Commission approves 265 MU to be drawn from this station during 2009-10 based on the drawl during the previous years.
172. The Commission's approval of power to be purchased by GRIDCO for 2009-10 from various stations of OHPC is given in the table below.

**Table - 16**  
**Drawl From Hydro Stations (2009-10)** (In MU)

<b>Source of Generation</b>	<b>Commission's Approval (2008-09)</b>	<b>GRIDCO Proposal (2009-10)</b>	<b>Commission's Approval (2009-10)</b>
Hirakud (Burla & Chiplima)	1162.26	1132.79	1132.79
Balimela	1171.17	1171.17	1171.17
Rengali	519.75	817.74	817.74
Upper Kolab	823.68	826.65	826.65
OHPC (Old stations)	3676.86	<b>3948.35</b>	<b>3948.35</b>
Upper Indravati	1942.38	1971.09	1971.09
Machkund	265.00	<b>265.00</b>	<b>265.00</b>
<b>Total Hydro</b>	<b>5884.24</b>	<b>6184.44</b>	<b>6184.44</b>

#### **Capital Cost of UIHEP:**

173. Some objectors have raised the issue of determination of capital cost of UIHEP in their submissions and also during public hearing. In this regard OHPC has contended that after long discussions and deliberations on the project cost of UIHEP during the hearing for tariff application for 2007-08, the Commission in its order dated 22.03.2007, had

approved Rs. 1195.42 crore as the final capital cost of UIHEP (600 MW capacity) for the purpose of determination of tariff. The tariff proposal of UIHEP is based on this approved capital cost.

174. Since the Commission after taking the diverse views expressed in the matter of determination of the project cost of UIHEP had concluded and approved the project cost at Rs.1195.42 crore, the issue should not be reopened once again. Thus, the final approved project cost of Upper Indravati Hydro Electric Project is Rs.1195.42 crore for determination of tariff.

**Annual Fixed Cost:**

175. For the purpose of computation of Annual Fixed Cost as per CERC Regulation, a detailed analysis of the following components has been made as under:

**Interest on Loan:**

176. The loan liabilities of OHPC consists of State Govt. loans and PFC loans. These loan liabilities outstanding as on 01.04.1996 are summarized in the table below.

**Table - 17**  
**Statement of State Government Loans**

<b>(Rs. in crore)</b>		
<b>Sl. No.</b>	<b>Description of Loan</b>	<b>Amount as on 01.04.1996</b>
1	9.8% loan	39.20
2	13% loan (UIHEP)	497.86
3	Interest free loan (UIHEP)	132.14
4	13% loan (Potteru)	14.3
5	Zero coupon Bond-I	383.10
6	Zero coupon Bond-II	383.10
7	Other loan	0.99

As revealed from the above table, the State Government loan of Rs.39.20 crore carries interest rate of 9.8% with repayment period of 15 years. There is a moratorium on principal repayment for five years starting from 2001-02. The Commission during 2001-02 and 2002-03 had allowed the repayment of principal amount of Rs.3.89 crore/annum. The same loan quantum would reduce to Rs.11.97 crore by 01.04.2009 after adjustment of repayments towards principal.

As per the recommendations of the Kanungo Committee and the subsequent Govt. of Orissa Notification dtd.29.01.2003, the effect of up-valuation of assets would be kept in abeyance from the financial year 2001-02 prospectively till 2005-06 or till the sector turns around, whichever is earlier. In the meanwhile, the Commission has suggested to the Govt. of Orissa for extension of these financial benefits to the consumers of the State

beyond 2005-06. The State Govt. has responded vide Lr. No. 1704 dtd. 17.02.2009 that the Finance Deptt. has also already conquered the proposal of keeping in abeyance of upvaluation of assets of GRIDCO/OPTCL and OHPC and freezing of RoE to GRIDCO and OHPC from the year, 2006-07 to 2010-11 and the matter would be placed before the State Cabinet for a decision. Accordingly, the interest impact of all other State Government loans except the above-mentioned Rs.39.20 crore (Rs.11.97 crore outstanding as on 01.04.2009) is not considered for the purpose of tariff.

The PFC loans were obtained in connection with projects like Chiplima, Burla and Upper Indravati and for extension of units 7 & 8 of Balimela. The outstanding PFC loan amount as on 01.04.2009 is indicated in the table below:

**Table - 18**  
**PFC Loan Outstanding**  
(Rs. in Crore)

	As on 01.04.2008	As on 01.04.2009
(a) Unit 3 & 4 Burla	52.14	45.59
(b) Unit 7 & 8 Balimela	86.40	76.80
(c) UIHEP	64.15	32.08
<b>Total</b>	<b>202.69</b>	<b>154.47</b>

For OHPC old stations, interest on loan including Guarantee Commission aggregates to Rs.16.85 crore and in case of UIHEP it comes to Rs.2.88 crore for the year 2009-10 as compared to Rs.18.95 crore and Rs.5.70 crore respectively for the FY 2008-09 as summarized in the table below:

**Table – 19**  
**Statement of OHPC Loans and Interest on Loan**

Source of Loan	Loan Outstanding		Interest on Loan	
	As on 1.04.2008	As on 1.04.2009	2008-09	2009-10
Govt. loan @ 9.8%	15.86	11.97	1.55	1.17
PFC Loan for 3 & 4 Burla	52.14	45.59	4.21	3.65
PFC Loan for Balimela 7 & 8	86.40	76.80	7.88	6.95
Deemed loan	8.29	22.56	0.99	1.82
Deemed loan for Balimela	27.00	24.00	3.24	2.18
Govt. Guarantee Commission	-	-	1.08	1.08
<b>Sub total (Old Stations)</b>	<b>189.69</b>	<b>180.92</b>	<b>18.95</b>	<b>16.85</b>
UIHEP (PFC Loan)	64.15	32.08	5.70	2.88

As such the Commission approves interest payment of Rs.16.85 crore for OHPC old stations and Rs.2.88 crore for UIHEP for the FY 2009-10.

**Depreciation:**

177. Depreciation is an important component of annual operating cost of the generating companies and it constitutes between 20 to 25% of the annual expenditure. In the instant case, the capital assets have been re-valued nearly 3 times of its historical cost. Earlier, upto FY 2000-01, the Commission had calculated depreciation on prevalent norms i.e. post'94 rate which substantially raised the revenue requirement due to upfront loading. Since 2001-02, as a part of corrective measures depreciation was limited to the principal loan repayment during a particular year. However, during 2003-04, as per the directions of the High Court of Orissa, depreciation was calculated at pre-1992 norms notified by Govt. of India on the book value of the assets. During 2004-05 again, the Commission calculated depreciation limiting to principal repayment.

For the purpose of determination of Annual Fixed Cost, depreciation computed @ 2.57% on the project cost is considered for FY 2009-10. However, in case of Hirakud Power System and Balimela where loan repayment is more than the computed depreciation @ 2.57%, the differential amount has been considered and the depreciation amount has been extended to meet full repayment of principal loan for the FY 2009-10. The details of repayment of loan as submitted by OHPC for old stations is as under:

**Table – 20**  
**Statement of Repayment of Loans (Rs. in Crore)**

<b>Power Stations</b>	<b>2008-09</b>	<b>2009-10</b>
RHEP	1.05	1.05
UKHEP	1.25	1.25
BHEP	13.55	13.55
HPS	10.72	12.50
<b>Total</b>	<b>26.57</b>	<b>28.35</b>

For the year 2009-10, depreciation is claimed in the tariff applying 2.57% in case of RHEP, UKHEP whereas for BHEP and HPS the requirement for actual loan repayment is considered for recovery through depreciation by OHPC as summarized below:

**Table-21**

<b>Name of the Power Station</b>	<b>Depreciation (Rs. Crore)</b>	<b>Remark</b>
<b>RHEP</b>	2.41	2.57(%)
<b>Upper Kolab</b>	2.89	2.57(%)
<b>Balimela</b>	13.55	Equal to loan repayment
<b>HPS Burla</b>	12.50	Equal to loan repayment
<b>Total</b>	<b>31.35</b>	

The amount of depreciation of Rs.31.35 crore is approved by the Commission for the FY 2009-10 for the old power stations of OHPC. In respect of UIHEP, the principle of depreciation linked to loan repayments provided in its PPA has been approved by the Commission. Following this principle, the amount to be recovered through depreciation is of the order of Rs.32.08 crore during the FY 2009-10 which is being passed on to tariff of UIHEP.

**Return on Equity:**

178. The new CERC Tariff Regulations for the period 2009-14 provides the following:
- (a) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 12.
  - (b) Return on equity shall be computed on pre-tax basis at the base rate of 15.5% and the rate of return on equity shall be computed by grossing up the base rate with the normal tax rate for the year 2008-09 applicable to the concerned generating company.
  - (c) Rate of return on equity shall be rounded off to three decimal points and be computed as per the formula given below:  
$$\text{Rate of pre-tax return on equity} = \text{Base rate} / (1-t)$$

Where t is the applicable tax rate.
179. Accordingly, the rate of return for OHPC power stations comes to 17.481% for the year 2009-10.
180. In regard to the equity base of OHPC, the same was already decided in the Commission's tariff order dtd.19<sup>th</sup> April 2002 in Case No. 65 of 2001 & Case No. 04 of 2002 vide Para 6.4.17 through Para 6.4.21. The relevant extract of the said order is reproduced below:
- "6.4.17 Thus, 5(i) para (B) and (ii) of the said notification should be replaced to state clearly that the break up of the provisional project cost of Rs.1195.42 Crore of UIHEP will be as under.*
- (b) Rs.320 Crore as loan from PFC*
  - (ii) Rs.576.561 Crore as Government debt carrying no interest from 1 April 2000 onwards till set oral turn around.*
  - (iii) Rs.298.85 Crore as Government equity*
- 6.4.18 These measures will go a long way in bringing down the cost of OHPC power.*
- 6.4.19 The Zero Coupon Bonds issued to the State Government for Rs.400 Crore by GRIDCO against revaluation of assets was not to carry any interest for a period of five years. Suitable amendments may be made to the relevant provisions of*



*the transfer scheme notification allowing zero coupon bonds to continue for a further period of five years or more depending on sectoral turn around.*

6.4.20 *The Commission on its part would like to take the following decisions in the matter of approval of PPA between OHPC and GRIDCO in the public interest to bring down the cost of OHPC power and the cost of transmission and distribution by allowing no return on equity of Rs.300.00 Crore created on account of asset revaluation of old OHPC station until sectoral turn around.*

6.4.21 *However, the Commission will allow appropriate rate of return on OHPC's own investment in R&M equity of Rs.22.56 Crore and on the equity of Rs.298.70 Crore of UIHEP. Dividends, if any, payable for the first four years should be ploughed back as fresh loan to OHPC by Government of Orissa."*

181. Based on the contents of the above order and subsequent Govt. Notification dtd.29.01.2003, the Return on Equity for the year 2004-05 was allowed to OHPC on new investments made only after 01.04.1996. In the meantime, the time frame notified by the Government to keep the effect of up-valuation in abeyance up to the financial year 05-06 or the time by which the sector turns around, has been completed. The Commission vide its letter No.2807 dtd.31.12.2008 has advised the Government to keep in abeyance the up-valuation of assets and other policy measures beyond 2005-06 till 2012-13, as the sector has not yet turned around.
182. For old stations RoE is calculated @ 17.481% on OHPC's own investment of Rs.58.10 crore in case of HPS and Rs.54.76 crore in case of Balimela. Thus RoE comes to Rs.10.16 crore in case of HPS and Rs.9.57 crore in case of Balimela. Similarly, for Rengali and Upper Kolab the RoE comes to Rs.0.14 crore and Rs.0.21 crore respectively. The total RoE for OHPC old stations comes to Rs.20.08 crore for FY 2009-10 .
183. The proposal of OHPC to allow return on 25% of the original book value of asset is not approved by the Commission.
184. In case of UIHEP RoE is calculated @ 17.481% on Government equity of Rs.298.70 crore which comes to Rs.52.22 crore. The Commission approves RoE @ 17.481% in line with new CERC norms to this project with a view to encourage the growth of hydropower in the State. OHPC should make all attempts to explore the possibilities on a long-term basis for utilization of hydro potential in the State. The Commission approves return on equity to OHPC amounting to Rs.72.30 crore for 2009-10 as summarized in the table below:

Table – 22

(Rs. in Crore)

Name of the Power Station	Return on Equity 2008-09 (@ 14%)	Return on Equity 2009-10 (@ 17.481%)
<b>RHEP</b>	0.11	0.14
<b>Upper Kolab</b>	0.16	0.21
<b>Balimela</b>	7.66	9.57
<b>HPS Burla</b>	7.19	10.16
<b>UIHEP</b>	41.82	52.22
<b>Total</b>	<b>56.95</b>	<b>72.30</b>

**O&M Expenses:**

185. OHPC has projected the O & M expenses for the FY 2009-10 in each of the power stations as follows:

Table – 23

(Rs. in Crore)

Particulars	HPS	BHEP	RHEP	UKHEP	UIHEP
Actual O & M Expenses for FY 2007-08 (Audited)	42.39	23.16	20.93	16.10	43.87
FBT and wealth tax based on A&G Expenses	0.03	0.02	0.02	0.06	0.09
Less: Expenses for rotor pole repair	-	-	-	-	(-)5.00
Total for FY 2007-08	42.42	23.18	20.95	16.16	38.96
O&M with 4% Escalation for FY 2008-09.	44.12	24.10	21.79	16.81	40.52
O&M with 4% Escalation for FY 2009-10.	45.88	25.07	22.66	17.48	42.14
Major repair of machines, switchyard renovation and trash rack replacement.	4.00	-	3.42	0.70	8.00
Proposed infrastructure development (own colony and power houses premises)	1.00	1.00	1.00	1.00	1.00
Effect of salary revision	8.45	6.11	4.51	3.07	6.42
i) Salary enhancement for current year					
ii) Arrear salary	11.14	8.27	10.22	9.18	17.89
<b>TOTAL (items 6+7+8+9)</b>	<b>70.47</b>	<b>40.45</b>	<b>41.81</b>	<b>31.43</b>	<b>75.45</b>

- Operation & Maintenance (O&M) expenses of UIHEP includes Rs.1 crore towards purchase of Fuji spares and Rs.7 crore towards major repair of governor

& excitation system (out of estimated Rs.14 crore, Rs.7 crore has already been allowed by the Commission in FY 2008-09 and balance Rs.7 crore has been proposed in the FY 2009-10).

- In case of HPS, addition of Rs.4.00 crore in O&M expenses includes Rs.1.50 crore, towards trash rack replacement of Units 1 & 2 of Burla Power House and Rs.2.50 crore towards renovation of switchyard of Chiplima Power House.
- In case of RHEP, addition of Rs.3.42 crore in O&M expenses includes Rs.1.20 crore towards procurement of M/s BHEL spares for generator and turbine and Rs. 0.22 crore towards replacement of UE relays of Unit-1 and Rs.2.00 crore towards purchase of turbine blades.
- In case of UKHEP, addition of Rs.0.70 crore has been proposed in O&M expenses for replacement of governor and excitation system of Units 1 & 2.
- Further, OHPC has proposed Rs. 1 crore for each of the power stations towards infrastructure development of own colony and powerhouse premises under this O & M head.
- A total amount of Rs. 85.26 crore has been proposed in O&M expenses for all the power stations towards salary revision including arrear salary.

186. As per new CERC Tariff Regulations 2009, which shall be applicable for the period 2009-14, the normative O&M expenses shall be as follows:

The actual O&M expenses for the years 2003-04 to 2007-08 shall be escalated @5.17% per annum to bring it to the 2007-08 price level and then averaged to arrive at the O&M expenses of the generating station at 2007-08 price level. Then it is to be escalated @5.72% per annum to arrive at the O&M expenses for the year 2009-10.

187. As per Para 122 (iv) of the Order dtd. 20.03.2008 of the Commission, Rs.2 crore had been considered towards major repair of turbine at RHEP and Rs.7.00 crore was allowed for major repair of governor and excitation system of UIHEP machines for the FY 2009-10.

188. OHPC has proposed to include Rs.28.56 crore towards salary enhancement of the ensuing year and arrear amount Rs.56.70 crore for the previous years under O&M head towards salary revision on implementation of 6<sup>th</sup> Pay Commission recommendations. Since OHPC has not yet submitted the approval of its Board of Directors on the mode of payment of arrear dues on implementation of the said salary revision, the Commission approves only the current enhancement in the salary of the employees of OHPC power stations in O&M expenses for the FY 2009-10.

189. Accordingly, the O&M expenses for the FY 2009-10 is calculated and the comparative provision of O&M expenditure approved for 2008-09 and 2009-10 is given in the table below:

**Table – 24**  
**Approved O&M Expenses**

Name of the Stations	2008-09	2009-10	
	Commission's Approval	OHPC proposal	Commission's approval
HPS	34.97	70.47	43.93
BHEP	26.37	40.45	30.95
RHEP	23.10	41.81	26.03
UKHEP	17.87	31.43	16.39
<b>Old Stations</b>	<b>102.31</b>	<b>184.16</b>	<b>117.30</b>
UIHEP	41.12	75.45	50.93
<b>Total</b>	<b>143.43</b>	<b>259.61</b>	<b>168.23</b>

**Interest on Working Capital:**

190. As per the new CERC Regulations the basis for calculation of working capital shall include the following:

- (i) Receivables equivalent to two months of fixed cost
- (ii) Maintenance spares @ 15% of Operational and Maintenance expenses and
- (iii) Operation and maintenance expenses for one month.

The rate of interest on working capital shall be the short-term prime-lending rate of State Bank of India. In accordance with CERC guideline, the interest on working capital shall be payable on normative basis as shown in table below:

**Table – 25**  
**Interest on Working Capital for FY 2009-10**

Description	(Rs. in Crore)	
	OHPC Old Stations	UIHEP
Receivables equivalent to two months of fixed cost.	32.14	23.75
Maintenance spares @ 15% of Operational and Maintenance expenses	17.60	7.64
Operation and maintenance expenses for one month.	9.78	4.24
<b>Total Working Capital</b>	<b>59.52</b>	<b>35.63</b>
<b>Interest on working capital calculated @ 12.25%</b>	<b>7.29</b>	<b>4.36</b>

**Total Annual Fixed Cost**

191. Based on the above parameters the station-wise ARR and tariff calculated for the year 2009-10 is indicated in the table below:

**Table – 26**  
**STATION-WISE TARIFF APPROVED FOR 2009-10**

**(Rs. in Crore)**

<b>Details of expenses</b>	<b>RHEP</b>	<b>UKHEP</b>	<b>BHEP</b>	<b>HPS</b>	<b>Sub-Total</b>	<b>UIHEP</b>	<b>Total</b>
Saleable Design Energy (MU)	519.75	823.68	1171.17	1162.26	3676.86	1942.38	<b>5619.24</b>
Interest on loan	0.31	0.37	10.05	6.12	16.85	2.88	<b>19.73</b>
Return on Equity	0.14	0.21	9.57	10.16	20.08	52.22	<b>72.30</b>
Depreciation	2.41	2.89	13.55	12.50	31.35	32.08	<b>63.43</b>
O&M expenses	26.03	16.39	30.95	43.93	117.30	50.93	<b>168.23</b>
Interest on working capital	1.36	0.89	2.24	2.80	7.29	4.36	<b>11.65</b>
<b>Total ARR (Rs. crore)</b>	<b>30.26</b>	<b>20.75</b>	<b>66.36</b>	<b>75.51</b>	<b>192.87</b>	<b>142.47</b>	<b>335.34</b>
<b>Average cost (P/U)</b>	<b>58.22</b>	<b>25.19</b>	<b>56.66</b>	<b>64.96</b>	<b>52.46</b>	<b>73.35</b>	<b>59.68</b>

**Income Tax**

192. As per new CERC Tariff Regulations, 2009, *Tax on the income streams of the generating company or the transmission licensee, as the case may be, shall not be recovered from the beneficiaries, or the long-term transmission customers, as the case may be:*

*Provided that the deferred tax liability, excluding Fringe Benefit Tax, for the period up to 31st March, 2009 whenever it materializes, shall be recoverable directly from the beneficiaries and the long-term customer.*

193. Accordingly, income tax i.e. Minimum Alternative Tax paid by OHPC during the FY 2007-08 to the tune of Rs.8.74 crore in case of UIHEP, Rs.6.65 crore in case of Balimela and Rs. 0.12 crore in case of Rengali power stations as submitted by OHPC is to be reimbursed directly from GRIDCO.

**Electricity Duty on Auxiliary Consumption**

194. As per the agreed PPA between OHPC and GRIDCO, the taxes and duties including ED on auxiliary consumption etc payable by OHPC to the State Government and other statutory bodies shall be passed on to GRIDCO in the shape of supplementary bill raised by OHPC and GRIDCO will make payment accordingly within 30 days of receipt of bills. To facilitate reimbursement of electricity duty, GRIDCO should include the same (based on the Design Energy), in its Annual Revenue Requirement prior to beginning of the year.

195. Accordingly, ED on Auxiliary consumption of all the hydro-electric projects to the tune of Rs.0.57 crore is to be reimbursed by OHPC from GRIDCO through separate billing. The details of ED on auxiliary consumption and income tax are summarized in the table below:

**Table-27**

**(Rs. in Crore)**

<b>Component of Costs</b>	<b>RHEP</b>	<b>UKHEP</b>	<b>BHEP</b>	<b>HPS</b>	<b>Sub-Total</b>	<b>UIHEP</b>	<b>Total</b>
<b>ED on Auxil. Consumption</b>	0.05	0.08	0.12	0.12	<b>0.37</b>	0.20	<b>0.57</b>
<b>Income Tax (MAT)</b>	0.12	0.00	6.65	0.00	<b>6.77</b>	8.74	<b>15.51</b>
<b>Total</b>	0.17	0.08	6.77	0.12	<b>7.14</b>	8.94	<b>16.08</b>

## Two-Part Tariff

196. Two-part tariff structure i.e. recovery of Annual Fixed Cost (AFC) through capacity charge and energy charge have already been implemented at Upper Indravati Power Station since FY 2005-06 and subsequently extended to all old power stations of OHPC from the FY 2007-08 onwards. As per Regulation-22 of new CERC Tariff Regulations, 2009, the tariff for supply of electricity from a hydro generating station shall comprise of capacity charge and energy charge to be derived in the manner as indicated below:

*Computation and Payment of Capacity charge and Energy Charge for Hydro Generating Stations.*

- (1) *The fixed cost of a hydro generating station shall be computed on annual basis, based on norms specified under these regulations, and recovered on monthly basis under capacity charge (inclusive of incentive) and energy charge, which shall be payable by the beneficiaries in proportion to their respective allocation in the saleable capacity of the generating station, that is to say, in the capacity excluding the free power to the home State:*

*Provided that during the period between the date of commercial operation of the first unit of the generating station and the date of commercial operation of the generating station, the annual fixed cost shall provisionally be worked out based on the latest estimate of the completion cost for the generating station, for the purpose of determining the capacity charge and energy charge payment during such period.*

- (2) *The capacity charge (inclusive of incentive) payable to a hydro generating station for a calendar month shall be*

$$AFC \times 0.5 \times NDM / NDY \times ( PAFM / NAPAF ) \text{ (in Rupees)}$$

*Where,*

*AFC = Annual fixed cost specified for the year, in Rupees.*

*NAPAF = Normative plant availability factor in percentage*

*NDM = Number of days in the month*

*NDY = Number of days in the year*

*PAFM = Plant availability factor achieved during the month, in percentage*

- (3) *The PAFM shall be computed in accordance with the following formula :*

$$PAFM = 10000 \times \sum_{i=1}^N DC_i / \{ N \times IC \times ( 100 - AUX ) \} \%$$

Where,

*AUX* = Normative auxiliary energy consumption in percentage

*DCi* = Declared capacity (in ex-bus MW) for the *i*th day of the month which the station can deliver for at least three (3) hours, as certified by the nodal load dispatch centre after the day is over.

*IC* = Installed capacity (in MW) of the complete generating station

*N* = Number of days in the month

- (4) The energy charge shall be payable by every beneficiary for the total energy scheduled to be supplied to the beneficiary, excluding free energy, if any, during the calendar month, on ex power plant basis, at the computed energy charge rate.

Total Energy charge payable to the generating company for a month shall be :

$(\text{Energy charge rate in Rs. / kWh}) \times \{\text{Scheduled energy (ex-bus) for the month in kWh}\} \times (100 - \text{FEHS}) / 100.$

- (5) Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis, for a hydro generating station, shall be determined up to three decimal places based on the following formula, subject to the provisions of clause (7) :

$$\text{ECR} = \text{AFC} \times 0.5 \times 10 / \{ \text{DE} \times (100 - \text{AUX}) \times (100 - \text{FEHS}) \}$$

Where,

*DE* = Annual design energy specified for the hydro generating station,

In MWh, subject to the provision in clause (6) below.

*FEHS* = Free energy for home State, in per cent, as defined in regulation 32.

- (6) In case actual total energy generated by a hydro generating station during a year is less than the design energy for reasons beyond the control of the generating company, the following treatment shall be applied on a rolling basis:

- (i) in case the energy shortfall occurs within ten years from the date of commercial operation of a generating station, the ECR for the year following the year of energy shortfall shall be computed based on the formula specified in clause (5) with the modification that the *DE* for the year shall be considered as equal to the actual energy generated during the year of the shortfall, till the energy charge shortfall of the previous year has been made up, after which normal ECR shall be applicable;
- (ii) In case the energy shortfall occurs after ten years from the date of commercial operation of a generating station, the following shall apply:

*Suppose the specified annual design energy for the station is DE MWh, and the actual energy generated during the concerned (first) and the following (second) financial years is A1 and A2 MWh respectively, A1 being less than DE. Then, the design energy to be considered in the formula in clause (5) of this Regulation for calculating the ECR for the third financial year shall be moderated as (A1 + A2 – DE) MWh, subject to a maximum of DE MWh and a minimum of A1 MWh.*

(iii) *Actual energy generated (e.g. A1, A2) shall be arrived at by multiplying the net metered energy sent out from the station by 100 / (100 – AUX).*

(7) *In case the energy charge rate (ECR) for a hydro generating station, as computed in clause (5) above, exceeds eighty paise per kWh, and the actual saleable energy in a year exceeds { DE x ( 100 – AUX ) x ( 100 – FEHS ) / 10000 } MWh, the Energy charge for the energy in excess of the above shall be billed at eighty paise per kWh only:*

*Provided that in a year following a year in which total energy generated was less than the design energy for reasons beyond the control of the generating company, the energy charge rate shall be reduced to eighty paise per kWh after the energy charge shortfall of the previous year has been made up.*

(8) *The concerned Load Despatch Centre shall finalise the schedules for the hydro generating stations, in consultation with the beneficiaries, for optimal utilization of all the energy declared to be available, which shall be scheduled for all beneficiaries in proportion to their respective allocations in the generating station.*

197. In the new CERC Regulations, 2009 the concept of primary and secondary energy have been done away with the term ‘energy’ only. Similarly the concept of Capacity Index is replaced with Normative Annual Plant Availability Factor (NAPAF). The annual fixed cost of a generating station is apportioned into capacity charge and energy charge on 50:50 basis. Further, in the context of OHPC power stations the concept of free power to home state does not apply. Hence, the Energy Charge Rate (ECR) for OHPC power stations shall be computed with the following formula.

$$ECR = AFC \times 0.5 \times 10 / \{ DE \times ( 100 - AUX ) \times 100$$

Where,

DE = Annual design energy specified for the hydro generating station, in MWh

AUX = Normative auxiliary energy consumption in percentage



198. Accordingly, the Commission approves the rate of energy charge and the capacity charge of OHPC power stations for FY 2009-10 as summarized in the table below:

**Table-28**  
**Energy Charge and Capacity Charge for 2009-10**

Name of the Power Stations	Annual Fixed Cost (Rs. crore)	Capacity Charge (Rs. crore)	Energy Charge (Rs. crore)	Energy Charge Rate (P/U)
Rengali HEP	30.26	15.130	15.130	29.11
Upper Kolab HEP	20.75	10.375	10.375	12.60
Balimela HEP	66.36	33.180	33.180	28.33
Hirakud Power System	75.51	37.755	37.755	32.48
Upper Indravati HEP	142.47	71.235	71.235	36.68

The recovery of capacity charge and energy charge for a calendar month shall be as per new CERC Tariff Regulations, 2009.

**Treatment of Revenue Earned from Excess Generation**

199. The Commission in its Order dtd.10.06.2005 in Case No.153/2004 had directed to maintain a separate fund to deposit the revenue earnings out of sale of secondary energy. OHPC had come with a petition explaining the difficulties for maintenance of such a separate fund and requested that the amount so earned should be earmarked and maintained as a part of OHPC's revenue. Accordingly, the Commission has issued a clarificatory Order vide Case No.38/2005 dt.22.10.2005 confirming that *"the revenue out of the sale of secondary energy may remain as part of normal fund of OHPC but shall be utilised to replenish the shortfall in revenue due to less generation by OHPC in years of hydrological failure to provide necessary comfort to the consumers of the state in accordance with para 6.5(e) of our order dt. 10.06.05"*.
200. The new CERC Tariff Regulations, 2009 has done away with the concept of secondary energy. Therefore, the Commission is of the view that the revenue earned by OHPC from sale of excess energy beyond design energy of its power stations may remain as a part of the normal fund of OHPC, but shall be utilized to replenish the shortfall in revenue in the years' of less generation by OHPC power stations due to hydrological failure.

**Normative Annual Plant Availability Factor (NAPAF)**

201. Regulation 27 (i) of the new CERC Tariff Regulations, 2009, stipulates the following:  
*The norms of operation as given hereunder shall apply to hydro generating station:*

- (i) Normative annual plant availability factor (NAPAF) for hydro generating stations
  - (1) Normative annual plant availability factor (NAPAF) for hydro generating stations shall be determined by the Commission as per the following criteria :
    - (i) Storage and Pondage type plants with head variation between Full Reservoir Level (FRL) and Minimum Draw Down Level (MDDL) of up to 8%, and where plant availability is not affected by silt : 90%
    - (ii) Storage and Pondage type plants with head variation between FRL and MDDL of more than 8%, where plant availability is not affected by silt: Plant-specific allowance to be provided in NAPAF for reduction in MW output capability as reservoir level falls over the months. As a general guideline the allowance on this account in terms of a multiplying factor may be worked out from the projection of annual average of net head, applying the formula:  
 (Average head / Rated head) + 0.02  
 Alternatively in case of a difficulty in making such projection, the multiplying factor may be determined as:  
 (Head at MDDL/Rated head) x 0.5 + 0.52
    - (iii) Pondage type plants where plant availability is significantly affected by silt: 85%.
    - (iv) Run-of-river type plants: NAPAF to be determined plant-wise, based on 10-day design energy data, moderated by past experience where available/relevant.
  - (2) A further allowance may be made by the Commission in NAPAF determination under special circumstances, e.g. abnormal silt problem or other operating conditions, and known plant limitations.
  - (3) A further allowance of 5% may be allowed for difficulties in North East Region.
  - (4) In case of a new hydro electric project the developer shall have the option of approaching the Commission in advance for fixation of NAPAF based on the principles enumerated in sub-clauses (1), (2) and (3) of this regulation.
  - (5) Based on the above, the Normative annual plant availability factor (NAPAF) of the hydro generating stations already in operation shall be as follows:

X      X      X      X      X

202. OHPC in its compliance to the queries of Director (Tariff) has mentioned the following:  
 As per clause-27(i)(1) of CERC (Terms and Conditions of Tariff) Regulations, 2009, the Normative Annual Plant Availability Factor (NAPAF) for hydro generating stations is determined as follows:

- (1) (i) Storage and pondage type plants with head variation between Full Reservoir Level (FRL) and Minimum Draw Down Level (MDDL) of up to 8% and where

plant availability is not affected by silt is 90%. The head variation for OHPC power stations are as given in table below:

**Table-29**

Name of the power station	FRL	MDDL	Maximum head	Minimum head	% head variation
HPS	630 ft	590 ft	35.5 m	26.5 m	25.35 %
Rengali	123.5 m	109.72 m	46.5 m	28.0 m	39.78%
Upper Kolab	858 m	844 m	265.73 m	241.72 m	9.03%
Balimela	1516 ft	1440 ft	289 m	257 m	11.07%
Upper Indravati	642 m	625 m	379 m	358 m	5.54%

(ii) For all other power stations except UIHEP, the head variation between FRL and MDDL is more than 8%. Hence, an allowance is to be provided in NAPAF for reduction in MW capacity as indicated in the table below:

**Table-30**

Name of the power station	% head variation	Unit No.	Rated head	Head at MDDL	Multiplying factor (Head at MDDL/Rated head) x 0.5+0.52	NAPAF (in %)
1	2	3	4	5	6	7(Cl.6x0.9x100)
HPS	25.35%	1 &2	31.6 m	26.5 m	0.9393	84.53
		3&4	30.78 m		0.9504	85.53
		5,6&7	26.5 m		1.02*	90.00
Rengali	39.78%		40.0 m	28.0 m	0.87	78.30
Upper Kolab	9.03%		253.0 m	241.72 m	0.9977	89.79
Balimela	11.07%		274.0 m	257.0 m	0.989	89.01

\*Since the multiplying factor is more than one so the multiplying factor is taken as 1.00.

(iii) Pondage type plants where plant availability is significantly affected by silt is 85%, which is not applicable to OHPC.

(iv) Run of river plants: NAPAF to be determined plant-wise based on 10 day design energy date, moderated by past experience, where available/relevant. This is applicable to Chiplima power station.

Availability (%) of Chiplima power stations given below:-

**Table-31**

Power station	2003-04	2004-05	2005-06	2006-07	2007-08
HPS-II Chiplima	50.80	50.91	47.98	53.21	53.91

As seen from the above table for last five years the plant availability has not crossed 55%. This is mainly due to weed menace in the power channel. Plant has to be taken on regular shut down to remove the weeds from the trash rack and choking of trash rack resulting in reduction in head. So OHPC proposes, NAPAF of 55% for Chiplima power house in line with CERC Tariff Regulations, 2009 wherein a NAPAF of 55% has been considered for Tanakpur (3x31.4 MW) Hydro Electric Project of NHPC.

(2) As per Clause-27(i)(2) of CERC (Terms and Conditions of Tariff) Regulations, 2009, “A further allowance may be made by the Commission in NAPAF determination under special circumstances e.g. abnormal silt problem or other operating conditions, and known plant limitations”.

The plant limitations for different power stations of OHPC are given below:-

#### **HPS (Burla and Chiplima)**

Extra 5% downtime is required as the upstream Reservoir Level has been advised to be kept at 598.15 Ft. by Water Resources Department instead of the normal 590.00 Ft.

For Chiplima it is 55% as stated above.

In case of HPS since the design energy is taken considering both Chiplima and Burla Power House, the NAPAF factor for both the power houses included should be the weighted average capacity of both the power houses.

NAPAF(%) when both Burla and Chiplima are combined equals to

$$= ( 49.5 \times 2 \times 80.30 + 32 \times 2 \times 81.25 + 37.50 \times 3 \times 85.50 + 24 \times 3 \times 55 ) / 347.5 \\ = 76.91\%$$

So OHPC proposes NAPAF (%) of 76.91 for both the power houses combined together.

#### **Rengali Hydro Electric Project:**

NAPAF will be 78% as calculated.

#### **Balimela Hydro Electric Project:**

The machines are very old and thus CERC’s proposal of further allowance of 5% on NAPAF may be made applicable. The machines shall be gradually taken up for renovation and modernization shortly.

#### **Upper Indravati Hydro Electric Project:**

Upper Indravati has been facing a peculiar problem of choking of trash rack by logs and silt. An extra maintenance of 15 days is necessary apart from routine maintenance during which all the four units shall remain out of service. At UIHEP, if a single unit is taken for planned/forced outage, the availability becomes 75%. In view of the above, a further allowance of 5% may be applicable.

#### **Upper Kolab Hydro Electric Project:**

The machines are very maintenance prone and hence, an allowance of 5% in NAPAF may be applicable.

(3) In addition to the factors above, the generating stations of OHPC are very old i.e. more than 15 years except UIHEP. The prime objectives of construction of dams were for flood control and irrigation. The Irrigation Department is the owner of the dam and downstream canals. Even during rainy season when water flows in canals, generation is restricted, as it leads to creation of flash flood in downstream. Further, in many cases in summer season, the release of water through power stations is controlled for downstream irrigation requirement which also restricts the generation. Therefore, the generating stations of OHPC may not be able to declare their full available capacity on account of restrictions on use of water.

(4) In view of the above, a further allowance of 5% may be allowed by the Commission for all the OHPC Power Stations as indicated below:

**Table-32**

Name of the power station	NAPAF (%) considering head variation between FRL & MDDL	NAPAF (%) after considering an Allowance of 5% due to operating conditions & known plant limitations
HPS	84.53	80.30
	85.53	81.25
	90.00	85.50
Rengali	78.30	74.38
Upper Kolab	89.79	85.30
Balimela	89.01	84.55
Upper Indravati	90.00	85.50
Chiplima	55.00	-

203. In its oral submission during hearing, OHPC had expressed that in the last two years, the generation at OHPC Power Stations was more than the design energy due to good rain fall. This exceptional case may not happen in future years. Because during the last 10 years the generation of OHPC Power Stations has been less than design energy in most of the years. In the current year also, OHPC may or may not achieve the design energy. As per the new CERC Tariff Regulations, 2009, the Annual Fixed Cost is apportioned to capacity charge and energy charge on 50:50 basis. In case of low generation, OHPC may not get its full energy charge. On the other hand, OHPC Power Stations are very old and require frequent maintenance for availability of their generation capacity. In case the availability of the Power Stations happens to be less than the Normative Annual Plant Availability Factor (which are to be fixed by the Commission), the capacity charge shall be reduced and OHPC Power Stations may not be able to recover their Annual Fixed

Cost. As a result of non-recovery of costs, the power stations may become gradually sick due to want of adequate funds for required maintenance and Renovation & Modernization of the plants and equipments. Hence, the Commission should fix the NAPAF (%) of each power station taking into consideration the plant limitations and operating conditions as submitted by OHPC.

204. The Commission looked into the provisions of new CERC Tariff Regulations, 2009 on determination of NAPAF for hydro generating stations and also the views of OHPC in this regard. The Commission feels that it needs indepth analysis to determine the NAPAF of each power station of OHPC. Further, the revised design energy of OHPC power stations are also to be analyzed for finalization by the Commission. Therefore, the Commission, for the FY 2009-10 provisionally fixed the NAPAF of 80% for low head power stations like HPS (Burla & Chiplima) and Rengali where there is a substantial impact of head variation and 85% for high head power stations like Balimela, Upper Kolab and Upper Indravati where impact of head variation is negligible. The monthly capacity charge shall be calculated based on this NAPAF(%) for the year 2009-10.

#### **Machhkund Hydro Electric Project**

205. OHPC has proposed the tariff of 13.90 P/U for Machhkund Power Station for the year 2009-10 based on 50% of the design energy i.e. 262.50 MU. The Commission has taken into consideration the net share payable by Orissa towards O&M expenses for the year 2007-08 (actual) which is to the tune of Rs.2.60 crore. Allowing an escalation of 4% per annum for the year 2008-09 and 2009-10, O&M expenses come to Rs. 2.81 crore. The rate per unit comes to 13.90 paise for the year 2009-10 considering the procurement cost of Rs.3.65 crore and 50% of the design energy ie. 262.50 MU. The Commission approves the procurement cost of Rs.3.65 crore for payment towards the energy of 262.50 MU from Machhkund HEP for FY 2009-10.

#### **Perspective Hydro Development in the State**

206. Many objectors raised that OHPC and the State Govt. should take initiatives to explore the possibilities of development of hydro power in the State. In its reply OHPC has expressed that the matter has been taken up with the State Govt. for development of Sindol-I project and nine other newly identified hydro electric projects. Since the development of hydro power is very crucial for the power sector in Orissa to supply power at affordable cost to the consumers of the State where people below poverty line in 46.4% OHPC and the Govt. of Orissa should give due importance to the suggestions made by very eminent hydro experts during the course of public hearing.

**Renovation and Modernization:**

207. The Commission is very much conscious about the renovation and modernization of the OHPC power stations for which directions were given in the previous Tariff Orders. In the meantime, independent expert teams have been engaged by the Commission to look in to the functioning of OHPC generating stations at Burla, Chiplima, Rengali, Upper Kolab, Upper Indravati & Balimela. The reports for Burla, Chiplima & Rengali power stations have been submitted earlier to the Commission and reports for rest power stations have been recently submitted. The team has suggested various measures like improvement of intake gates / pumping system / water conduit system / thrust & collar bearings / fire fighting system / excitation system / cables etc. The team has suggested for optimal utilization of the reservoir level. The team has also stressed upon the safety aspect of the power house & switch yard. The Commission has reviewed the report for Burla, Chiplima & Rengali in the presence of the enquiry teams and the OHPC officials and has directed OHPC to take following necessary steps:

- Proper maintenance of the hydro stations & optimum use of hydro potential of the State so as to meet the electricity demand of the State.
- Delegate the financial/ administrative/ technical powers up to the middle level with proper accountability.
- Take account of the added security requirement.
- Filling up of vacant posts.
- Suitable inventory management in place with sufficient spares for timely maintenance.
- Maintaining the history sheets & registers of the equipments in a proper manner.

208. In its reply, OHPC has reported that it has already taken up the short term measures for immediate compliance and then the compliance relating to long term measures shall be subsequently taken up.

209. **The application of OHPC for approval of its Annual Revenue Requirement and fixation of generation tariff for the FY 2009-10 thus stands disposed.**

**The Tariff now approved shall be operative from 01.04.2009 and continue until further order.**

Sd/-  
**(K. C. BADU)**  
**MEMBER**

Sd/-  
**(B. K. DAS)**  
**CHAIRPERSON**