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- iv) Shri R.C. Padhy
  - v) Shri Nageswar Rao
  - vi) Orient Paper Mills
3. Before actual hearing on the interim PPA, a pre-hearing conference was held on 20.11.2000 to narrow down the areas of disagreement that existed in the draft interim PPA submitted by GRIDCO.

During the first hearing on 23.03.2001, the Commission inter-alia ordered that the Director (Tariff) may go through the filings and submissions whereafter circulate a note incorporating his professional views on various aspects of the PPA to facilitate further hearing process.

4. Before discussing various issues involved in the interim PPA, the Commission examined the ambit of its jurisdiction in dealing of the present petition.
5. Section 43A(2) of the Electricity (Supply) Act, 1948 (hereinafter called the ES Act) provided that the terms, conditions and tariff for sale of electricity in respect of a Generating Company wholly or partly owned by one or more State Govts. shall be such as may be determined from time to time by the government or governments concerned. However Sec. 43A(2) of the ES Act was deleted with effect from 15<sup>th</sup> May 1999 by the Central Govt. The implication of the said deletion was clarified by Govt. of India in its letter dated 1<sup>st</sup> June 1999 to CEA the extract of which is given below.

“CERC and SERC in the States like Orissa and Haryana where Section 43A(2) has been dis-applied will, however, be entitled to deviate from such tariff notification issued by the Government. In case of such deviation, reasons will be recorded by the Commission. The Commission will adopt the principles contained in the notification and modify them as the circumstances require. However, the discretion has to be left to the CERC and SERC to follow the norms as they, in exercise of quasi-judicial power, consider just and proper. In doing so, the norms

of operation and PLF laid down by the CEA will be a guiding factor and not a binding factor”.

6. The Commission also noted that one of the functions of the Commission as described in Sec.11(e) of the OER Act 1995 is to regulate the purchase of electricity. The Transmission & Bulk Supply License issued to GRIDCO requires it to purchase power in an economical manner and under a transparent power purchase procurement process.
7. In view of the above provisions of the OER Act 1995, and Govt. of India guidelines, Commission clearly has the jurisdiction to decide various norms relating on which tariff for sale of electricity by Generating Companies would have to be determined.
8. The views of GRIDCO, OHPC and the objectors on various issues relating to Interim PPA were taken into consideration by the Commission. It also took note of the observation of CERC in para 1.2.7 of its order in Petition No.4/2000 dealing with operation norm for thermal generation which is extracted below:

“the tariff, terms and conditions framed by this Commission may constitute the guidelines for the State Electricity Regulatory Commissions and the Governments. This can bring about uniformity in approach for the country as a whole. This is however without prejudice to the jurisdiction statutorily conferred on the respective authorities”.
9. Having considered the above, we now go to various norms for hydro stations after hearing GRIDCO, OHPC and other objectors.

10. **Design Energy** :

- 10.1 GRIDCO, in its submission, proposed that design energy of HPS, Rengali, U.K. & Balimela may be taken in line with the tariff order of OERC dated 30.12.99, i.e.

<u>P.S.</u>		<u>MU</u>
HPS	--	1174
Rengali	--	750
U.K.	--	832
Balimela	--	1183
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	Total	3939

11. OHPC objected to the figure of 750 MU being considered for Rengali H.E. Project since as per project report the firm power is only 60 MW (525 MU). Further, OHPC argued that ‘design energy’ as defined by GOI is 95% of the ‘firm energy’ and as such 0.95 is to be factored into firm energy to arrive at design energy. They submitted their calculation of design energy as follows.

<u>PS</u>	<u>Firm Energy (MU)</u>	<u>Deisgn Energy (MU)</u>
HPS	1174	1115.30
Rengali	525	498.75
U.K.	832	790.40
Balimela	1183	1123.85
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Total :	3714	3528.30

To corroborate their point, they produced a letter from MOP, GOI. As such, they emphasized that OERC should consider annual availability of 3528 MU only from these power stations while calculating tariff. [Vide F.No.2/11/NHPC/Tariff/97 dated 20<sup>th</sup> January 1998] and not 3939 MU as claimed by GRIDCO.

12. Sri R C Padhi, one of the objectors, reiterated that OERC’s tariff order dt.20.12.99 assumed a designed energy of 3993.35 MU and OHPC cannot arbitrarily reduce this. He also pointed out that the design energy of Rengali after implementation of stage-II (2x50 MW) has increased by 225 MU. Before commenting on the

acceptability of Mr. Padhi's objections we must set the record straight by stating that the Commission assumed the total availability of power and drawal of 3993.35 MU and did not determine design energy at that stage.

13. Sri R P Mohapatra, in his submission, pointed out that as per GOI notification, the design energy is the quantum of energy that would be generated in a 90% dependable year with 95% availability of the machines. In other words, in case of Hirakud & Rengali, which releases water during monsoon for flood control, it is the energy that can be generated both from live storage as well as from flood discharge when all the units can be taken into service ensuring at least 95% availability of the machines during the time. According to Mr Mohapatra after implementation of stage-II Rengali, the design energy stands at 750 MU i.e. firm energy 525 MU + secondary energy 225 MU.
14. Sri M V Rao, representing UCCI also put forth similar argument and suggested that a design energy of 3927 MU should be considered by OERC.

We have considered the views expressed by OHPC, GRIDCO and other objectors on 'design energy' as defined by GOI in their notification. We agree with R.P. Mohapatra's explanation of 'design energy' particularly for projects like Hirakud and Rengali. In these two projects, flood discharge is a regular annual phenomenon even in 90% dependable year. The energy content in the flood discharge relating to 90% dependable year which can be extracted with 95% availability of the power station need to be added to the primary energy to arrive at 'design energy'.

15. However the contention of Shri Mohapatra and Shri Padhi that the project affords 225 MU of secondary energy in Rengali Project in 90% dependable year with implementation of phase-II (2x50 MW) is not acceptable to us. The techno-economic note of CEA for stage-II which was collected from CEA during discussions with them on 'design energy' puts the power potential of Rengali as under:

“The hydro electric potential of the project at Dam site power station has been assessed at 60 MW continuous (526 GWH annually) on firm basis. Besides, the project would afford secondary generation of 225 GWH **on an average**”, which implies clearly that the secondary energy generation of 225 GWH does not relate to 90% dependable year but is the average energy generation of the considered series for which power potential studies were carried out.

16. We are also convinced that flood discharge in 90% dependable year would take place and some secondary energy can be generated with 95% availability of 5x50 MW capacity power station but the secondary energy in 90% dependable year would be marginal and lowest of the considered series. We would have appreciated if the copy of the power potential studies carried out by CEA for the purpose of TEC was made available to commission by OHPC to arrive at the design energy of RHEP. However, we may take the clue from the stage-I report (3x50 MW) which reads at para 17.2 on power potential as follows:

“The reservoir offers a regulated discharge of 7000 cusecs in 90% dependable year. The average net head is 120", the firm continuous power available is 60 MW at 100% load factor.

The secondary power in 90% dependable year is negligible being only 2.74 GWH”.

17. The above secondary generation is for 3 units, which can be prorated for 5 units and factored by 0.95 for availability to get a closer value of secondary energy with implementation of Phase-II  $\frac{2.74 \times 250}{150} \times .95 = 4.3$  GWH

150

As such we may neglect this for the time being for the purpose of approval of interim PPA.

18. The next issue is the design energy of Hirakud Project consequent to R, M&U of Unit-I & II. Shri R. P. Mohapatra, Shri R. C. Padhi & Shri M.V. Rao in their

submissions reiterated that due to uprating, the project would offer additional 28 MU as per TEC of CEA for R, M&U of Unit-I & II of HPS.

19. The Techno-economic Appraisal Report of CEA on R, M&U of Unit-I & II was looked into. Para 5.3 of the report reads as under:

“The benefits due to uprating of the existing units each of 37.5 MW to 48.75 MW (30% increase) as proposed are likely to be available from Sept. to February i.e. for six months (varying from 45 MW to 48.75 MW). The energy benefits due to uprating are likely to be of the order of about 28 MU per annum’.

20. This does not specifically state that this quantum of energy would be available in all the years and whether it is 90% dependable. In view of this, it cannot be considered as a part of ‘design energy’ of the project. The projection of ‘likely’ increased amount cannot be treated as firm or dependable.
21. When CEA issued Techno-Economic Clearance for OHPC hydro projects it had not introduced or adopted the concept of Design Energy. It is only later that the CEA has been setting out Design Energy for new projects. Thus, the CEA has not determined Design Energy in respect of hydro projects of OHPC either at the time of issuing techno-economic clearance or at any time thereafter. Hence, in the light of discussion in earlier paragraphs, the Commission considers it appropriate that the Design Energy of the hydro projects of OHPC be considered same as that of firm energy as set out by CEA in their TEC. Accordingly design energy/firm energy of OHPC shall be taken at 3714 MU as at paragraph 11 above.
22. The contention of OHPC that ‘design energy’ is 95% of the firm energy is also not acceptable as the definition of ‘design energy’ as per GOI guidelines does not mean that. The guidelines clearly mean that 95% availability has to be ensured during spilling time (flood discharge) to get optimum energy generation from the flood discharge and thus factoring of 0.95 on the annual firm energy to arrive at design energy is totally misplaced.

23. We would now discuss whether it is necessary to review the ‘design energy’ of these projects before a long term, commercially enforceable PPA is executed between GRIDCO & OHPC.

23.1 OHPC argues that it is a necessity since the power potential studies were carried out some 30-35 years back and they might have lost relevance. To support its contention, it has claimed that hydrology for all the projects except that of Rengali has been consistently failing.

23.2 It further stated that changes in the yield series due to climatic conditions, upstream utilisation, progressive silting – all affect hydrology. Further CEA’s power potential study was based on rainfall run-off correlation and generation of a long term yield series through simulation. Now after implementation of the project, actual data have been generated. It will be therefore, fair that ‘design energy’ which finally determines the tariff is re-established with the latest actual data. Govt. of India, Ministry of Power and CERC also support review of the ‘design energy’ before long term PPA is entered into.

23.3 Taking note of the arguments of OHPC, GRIDCO and other objectors on review of the ‘design energy’ of projects, we direct OHPC to approach CEA to review the hydrology of all the hydro projects in view of changed circumstances, new commercial environment and latest norms of GOI.

23.4 Pending review, future two part tariff has to be based on the existing parameters.

#### 24. **Debt-Equity ratio & Return on equity**

The capital structure of these projects under operation as approved by Govt. at the time of transfer of assets (01.04.96) is as follows.

Net Fixed Asset	--	Rs.1196.8 Cr.
Equity	--	Rs. 300.0 Cr.
Debt	--	Rs. 896.8 Cr.



Both GRIDCO & OHPC in consultation with Energy Deptt. agreed to fix ROE at 12%.

- 24.1 OHPC, during prehearing conference claimed that the 100% investment made by them for RM&U after 01.04.96 be treated as equity and 16% return on equity be considered in line with GOI guidelines.
- 24.2 GRIDCO agreed to consider only 30% of the investment as equity and 12% ROE on that.
- 24.3 During hearing process however, OHPC finally withdrew the claim and agreed for 70:30 Debt equity ratio and 12% ROE on RM&U works.
- 24.4 Sri R. P. Mohapatra in his rejoinder, mentioned that the cost incurred by OHPC on RM&U may not be accepted as such unless it is approved by CEA.
- 24.5 UCCI representative suggested a Debt equity ratio of 75:25.
- 24.6 After hearing OHPC, GRIDCO and other objectors, Commission decides that Debt equity ratio be kept as 75:25 and ROE at 12% for investments made by OHPC after 01.04.96.
- 24.7 Further, in the light of latest available notification of GOI on RM&U, Commission feels that approval of CEA for the cost incurred by OHPC is not necessary and it is very much within competence of OHPC to do so.

## 25. **Pricing of Secondary Energy**

- 25.1 During hearing, OHPC argued that in view of latest hydro policy of GOI and notification dated 13<sup>th</sup> May 1999, the rate for secondary energy shall be equal to per unit cost of primary energy.

- 25.2 GRIDCO also admits that GOI guidelines stipulate same price for secondary energy only when two part tariff is considered i.e. capacity charge and energy charge are separately worked out. But in this case, it is single part tariff and as such the above norm is not applicable.
- 25.3 Sri R. C. Padhi, commenting on the issue stated that 1994 GOI notification is not applicable to these power stations. He suggested that K. P. Rao Committee recommendation prior to GOI notification 1994 fixing 5 paise/KWH of secondary energy can be adopted.
- 25.4 We have taken note of the fact that GOI 1992 tariff notification, where under a single part tariff the rate of secondary energy has been fixed at 5% of the average energy rate.
- 25.5 The present tariff proposal is single part tariff. But the project wise tariff has not been worked out and a combined tariff proposal in the shape of interim PPA has been posed before us. Although project wise design energy has been brought out during the process of hearing, project wise cost has not been indicated and as such whenever there is excess generation beyond design energy of 3714 MU as approved in para 21 of this order, in any particular year, that excess generation shall be payable @ 5% of the average energy rate for the purpose of tariff calculation of this interim PPA.

## 26. **O&M Expenses**

- 26.1 Govt. of India tariff notification dt.31.03.92 ammended upto 13<sup>th</sup> May 1999 provides that

‘O&M expenses including insurance expenses for the 1<sup>st</sup> year after commissioning shall be calculated at 1.5% of approved capital cost’.

- 26.2 In case of OHPC, to calculate the O&M cost from base year 1996-97, after transfer of assets on 01.04.96, it has adopted current capital cost of @Rs.3.19

Cr/MW as a base for calculation of O&M expenses with provision for 8% annual escalation.

- 26.3 This was objected to by Shri R P Mohapatra & representative of UCCI, on the ground that cost of hydro projects vary widely basing on head, location and other special features and no normative cost per MW should hold good.
- 26.4 OHPC explained that they had collected data of completed cost of some hydro projects from CEA relating to the time period and adopted the cost of Rs.3.19 Cr/MW in consultation with GRIDCO. GRIDCO also admitted to have discussed on this normative and after approval of their Board of Governors, allowed OHPC to provide for this normative.
- 26.5 The contention of Mr Mohapatra is convincing. OHPC should have given details of the projects from where references have been drawn. Commission would have appreciated had OHPC treated each project separately to arrive at its likely completed cost as on 01.04.96 in view of divergent features of each project.
- 26.6 During hearing the representative of OHPC, brought to our notice the contents of report “operating norms including O&M cost norms for Hydro Power Station” of M/s. WAPCOS [Report prepared for CERC] regarding likely completed cost in 1997-98 of 29 Hydro projects of India. The average cost per MW is above Rs.4 Cr.
- 26.7 OHPC’s Projects comprise of 2 nos. High head (680 MW) 3 Nos. medium head projects (580 MW). Adopting a cost/MW of Rs.3.19 Cr. for the combined installation with base year of 96-97 may not be very much out-of-place. Commission, rather feels that this figure is lower than actual completed cost.
- 26.8 As such, Commission agrees with OHPC & GRIDCO to adopt Rs.3.19 Cr./MW to calculate annual O&M expenses based on normative of 1.5%.

- 26.9 Some objectors suggested that Commission should consider O&M expenses to be based on actual annual expenditure figures of OHPC and not on normatives. OHPC stated that there are still many issues on O&M to be resolved – Cess, Income Tax, O&M charges for Dam appurtenant structure payable to W.R. Deptt. and ED on Auxiliary consumption payable to Govt., etc. As such the actual expenditure so far incurred would not reflect the final O&M charges. We agree that linking it to actual expenses will leave the tariff fixation open-ended and subject to dispute.
- 26.10 Commission also feels that allowing of actual expenses on O&M to OHPC would be discriminatory in view of the fact that OPGC & TTPS (NTPC) etc. avail the benefits on normative as per the PPA. However, annual escalation of 8% as provided in the PPA may be replaced and linked with consumer price index and whole sale price index as per the formula given below.

$$[0.3 (CPI_1/CPI_0) ++ 0.7 (WPI_1/WPI_0)]$$

Where,  $CPI_1$  - The Indian Consumer Price Index in effect on the last day of the most recent Month for which figures are available.

$CPI_0$  - The Indian Consumer Price Index in effect as on Commercial Operation Date of last unit.

$WPI_1$  - The Indian Whole Sale Price Index in effect on the last day of the most recent Month for which figures are available.

$WPI_0$  - The Indian Whole Sale Price Index in effect as on Commercial Operation Date of last unit.

## 27. Depreciation

- 27.1 Rate of depreciation has been taken as 3.98% in the draft PPA for the calculation of tariff.

- 27.2 One of the objectors, namely Shri R.P. Mohapatra, has submitted that the rate of depreciation assumed as 3.98% is unusually high. He claimed that total depreciation amount should be limited to 90% of the original book value over the life of the plant which is 35 years. Units 1 to 6 Burla and units 1 to 3 of Chipilima have been fully depreciated and no further depreciation should be allowed. OHPC should furnish the details of transfer cost of each of the power station and the cumulative figures of depreciation recovered for each of the stations upto 31.3.96. Further the amount of depreciation should be limited to the amount of loan to be repaid.
- 27.3 UCCI has submitted that the approved capital costs of individual projects together with cumulative depreciation recoveries should be obtained by OERC so that excess collection on account of depreciation is controlled. Charging depreciation @ 3.98% is penalizing the consumers.
- 27.4 On the question of asset base for the purpose of depreciation, there are two options either to go for the historical cost base or the depreciated replacement cost value as arrived by GOO on 1.4.96. The Commission in Case No.4/1997 at para 8.4 has observed that “revaluation of assets, etc. are beyond the scope of the Commission as these have been done either in consequence or through an Act of the legislature of which the Commission is a creature”. Therefore for the purpose of calculation of depreciation, the cost at which the hydro assets were acquired by OHPC as on 01.04.1996 would have to be considered.
- 27.5 We have carefully examined the views of various objectors. Our findings on depreciation as an element of fixed cost are indicated below:

OHPC has adopted the following rate of depreciation for different power stations as indicated against each.

- |    |                                    |   |       |
|----|------------------------------------|---|-------|
| 1) | Hirakud Power Station              | - | 4%    |
| 2) | Rengali Hydro Electric Project     | - | 3.64% |
| 3) | Upper Kolab Hydro Electric Project | - | 4.43% |
| 4) | Balimela Hydro Electric Project    | - | 3.5%  |

It has submitted a calculation sheet in its letter dated 10.05.2001 for rate of depreciation for individual power stations the weighted average rate of which works out to 3.98%.

27.6 For the purpose of calculation of depreciation the rate percentage as prescribed in the GOI notification of 1994 for various elements of components of cost of Rengali, Upper Kolab and Balimela Power Stations have been considered. The rates are as follows:

1)	Dam and Appurtenant works	-	1.95%
2)	Power House Civil Works including water conductor system and power house building	-	3.40%
3)	Hydro generating equipments	-	3.40%
4)	Generator transformer and switch gear and Switch yard etc.	-	7.84%
5)	Vehicles and battery	-	33.4%
6)	Air conditioning system	-	12.77%
7)	Communication equipments meters, office equipments internal wearing	-	12.77%

The depreciation of Hirakud Power System Burla has been considered as the weighted average rate of Balimela, Rengali of Upper Kolab Power Stations.

27.7 The issue of depreciation has been examined by the Commission as it is an important component of annual fixed costs for generating companies and may constitute 22 to 25% of the annual expenditure. As compared with other elements of annual operating costs, this expenditure is not a cash outgo for the companies but is a book adjustment representing a fraction of the asset costs and is recovered generally for replacement of capital subscribed. Pre-1992 situation stipulated a fair life and straight line method for recovery of depreciation but in 1992 and 1994 the GOI introduced higher depreciation/advance depreciation to enable private investors to recover 90% of their investment cost much earlier which require front loading on tariff.

- 27.8 The Commission also examined the option of adopting the rate of depreciation as provided in Supply Act, 1948 prior to 1992 on the revalued asset base as suggested during the course of the hearing.
- 27.9 The GoI notification dated 29<sup>th</sup> March 1994 is applicable for calculation of depreciation for the hydro assets of the Hydro Generating Stations. The CERC in para 3.5.10 in case No.32/2000 has ordered that depreciation shall be calculated annually by the straight line method as per pre-1992 in the schedule as notified under Supply Act, 1948. The CERC in para 1.2.7 in case No.4/2000 had observed that the tariff terms and conditions framed by the condition may constitute the guideline for the SERCs and State Govts. to bring about a uniformity in approach for the country as a whole without prejudice to the jurisdiction statutorily conferred on the respective authorities.
- 27.10 Taking all these factors into consideration, the Commission is of the opinion that since the March 1994 notification was the latest operational guidelines same rate should be applied for the purpose of calculation of depreciation stipulated therein for this interim PPA and accepted at 3.98%.
- 27.11 If at a later date the Commission in line with the thinking of the CERC accepts pre-1992 rates of depreciation, the total recovery of these assets shall be limited to 90% of the asset cost including the portion of asset cost already recovered from 01.04.96 to 31.3.2001 @ 3.98%.

## **28. Delayed payment surcharge**

- 28.1 OHPC insists that there should be DPS clause in the PPA in order to ensure that, GRIDCO pays the power bill in time. GRIDCO contends that, the interim PPA for 1997-98 stipulates that payment of DPS is subject to clearance of GOI on this issue. Till then, OHPC will raise bills towards all penal interest and any other interest suffered by OHPC on account of delayed payment from GRIDCO and the same shall be reimbursed by GRIDCO. None of the constituents including

GRIDCO are paying against DPS claim of NTPC and PGCIL. Hence as per said provision only penal interest is payable but not DPS. Further in the meeting held on 9.6.99 in the Deptt. of Energy it was decided to waive DPS upto 1998-99.

28.2 GRIDCO has further maintained that hydro stations are peak load plants. The availability of machines is the prime requirement for GRIDCO to meet its peak load. In two-part tariff there is penal provision for less availability of units. But in single part tariff no penal provision exists for less availability of units. The design energy can be achieved with 50% availability of units. Due to less availability of units GRIDCO is forced to purchase high cost of power. Poor availability of machines is causing much hardship to GRIDCO. Hence in the interim PPA adapting single part tariff, the DPS provision should not be kept. DPS provision can be incorporated on adoption of two-part tariff. OHPC however has clarified that DPS clause may be waived from the PPA in case GRIDCO agrees to make full payment of energy bills through Escrow Account or Letter of Credit.

28.3 The Commission has considered the contention of both OHPC and GRIDCO. In the financial restructuring plan of GRIDOC, it was suggested that all the stakeholders engaged in the power sector reform should make some sacrifice for making the reform process a success. Therefore OHPC should not insist for levy of DPS on the dues upto 31.3.2001. Further if GRIDCO can make full payment of energy bills through Escrow of LC the DPS clause may be waived and incentive for prompt payment may be built into the future PPA.

## 29. **Auxiliary consumption**

29.1 The Govt. of India guidelines dtd.30.3.92 provides for 1% of energy generated towards auxiliary consumption and transformation losses (0.5% each). The same percentage may be treated towards auxiliary consumption for the interim PPA under consideration. OHPC should provide metering arrangements for correct recording of auxiliary consumption which should also include meters for the static excitation (if any). It will be possible to redetermine the percentage of auxiliary consumption only when meter readings for a whole year is available. Until such



determination the normative rate as indicated in GoI guidelines is adopted. It is needless to say that auxiliary consumption has to be deducted from design energy of 3714 MUs.

30. In the view of the above, the Commission orders that GRIDCO and OHPC should recast their interim PPA for the year 1998-99, 1999-00 and 2000-01 in the light of the observations made and send copies of the PPA with tariff calculations distinctly for each year to the Commission for vetting.
- 30.1 OHPC is advised to move CEA within a period of three months to review the design energy of each of the hydro projects expeditiously for incorporation in future. GRIDCO should submit station wise PPA in respect of these stations based on a two-part tariff linking it to the performance with provision of penalty and incentive for the generators to be effective from 01.4.2001. If design energy cannot be established with approval of CEA within that period the PPA be submitted on the basis of design energy as established in this order.
31. The application for approval of interim PPA with tariff projection for financial year 1998-99, 1999-00 and 2000-01 is disposed of accordingly.

**(H.S. SAHU)**  
**MEMBER**

**(D.K. ROY)**  
**CHAIRMAN**