BEFORE THE CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No.24/2000

Coram :

1. Shri S.L. Rao, Chairman
2. Shri D.P. Sinha, Member
3. Shri G.S. Rajamani, Member
4. Shri A.R. Ramanathan, Member

In the matter of

Proposal for purchase of power by PTC from HIRMA Mega Power Project and sale of such power on back to back basis to SEBs .

In the matter of :

M/s. Power Trading Corporation of India Ltd., (PTC)

1115-16, Hemkunt Chambers

89, Nehru Place, ……… Petitioner

New Delhi-110 019.

AND

1. M/s. Southern Energy Asia -Pacific Ltd. (SEAP)

2. Gujarat State Electricity Board

1. Rajasthan State Electricity Board
2. Madhya Pradesh Electricity Board
3. Haryana Vidyut Prasaran Nigam Ltd.
4. Punjab State Electricity Board
5. Power Grid Corporation of India Ltd. (PGCIL)..…Respondents

The following were present on behalf of the parties on 01-09-2000.

1. Shri T.N. Thakur, CMD, PTC Petitioner

2. Shri Rakesh Nath, Dir. , PTC -do-

3. Shri S. Seth Vedantham, Adviser, PTC -do-

4. Shri Mahendra Kumar,GM, PTC -do-

5. Shri R.K. Mehta, Advocate, PTC -do-

6. Shri A.K. Maggu, Sr.Manager, PTC -do-

7. Shri Sanjay Kapoor, Country Manager,SEAP Respondents

8. Shri Victor Choi, Sr.Project Analyst, SEAP -do-

9. Shri Larry Beards, Eng. Manager, SEAP -do-

10. Shri Sanjeev Aggarwal, Fin. Analyst, SEAP -do-

11. Shri Parag P. Tripathi, Sr.Advocate, SEAP -do-

12. Ms. Mamta Tiwari, Advocate, SEAP -do-

13. Shri G.M. Aggarwal, SE(P&P) RVPN -do-

14. Shri L.N. Nimawat, XEN, RVPN -do-

15. Shri Satjit Singh, Dy Mgr. PSEB -do-

16. Shri I.C. Jain, Addl. CE(IPC), MPEB -do-

17. Shri S.P. Degwekar, SE(Can.), MPEB -do-

18. Shri U.N. Challu, SVP, SBI Cap. Consultants

19. Shri Harsh Gupta, AVP, SBI CAP. -do-

20. Shri Rajan Gupta, SVP, SBI CAP. -do-

21. Ms. Meghana Pawar, Mgr., SBI Cap. -do-

22. Shri Rajat Misra, Manager, SBI Cap. -do-

23. Shri J.P. Chalasani, VP, Reliance Power

24. Shri Samir Saran, Dy Mgr, Reliance Power

The following were present on behalf of the parties on earlier hearings.

1. Shri K.B. Gopala Krishnan, Sr. V.P., SBI Caps - Consultants.

2. Shri J.F. Nagori, V.P. (Projects), Black & Veatch - - do -

3. Shri Thomas Scott Morey, Ex-Director, SEAP, HK - Respondent

4. Shri G. Chandra Sekran, Co-ord. Manager, SEAP - Respondent

5. Shri Sameer Gupta, Fin. Analyst, SEAP - Respondent

6. Shri P. Zutshi, Chief Engineer, (PPM), RVPNL - Respondent

7. Shri V.K. Gupta, S.E., RVPNL - Respondent

8. Shri J.M. Vashisht, Chief Engineer, PSEB - Respondent

9. Shri H.S. Bedi, Director, PSEB - Respondent

10. Shri R.K. Arora, XEN, HVPN - Respondent

ORDER

(DATE OF FINAL HEARING : 01.09.2000)

A.R. RAMANATHAN

MEMBER

THE PETITION

M/s Power Trading Corporation of India Limited (PTC) with its registered office at Hemkunt Chambers, 89, Nehru Place, New Delhi, filed this petition on 31st March, 2000, praying for approval of tariff for the proposed Mega Power Project with a net capacity of 3960 MWs (6x660 MW). The Project is proposed to be developed by M/s Consolidated Electric Power (Asia) Ltd. (CEPA) in the State of Orissa as a pit head Plant. The power generated from this Project is proposed to be transmitted to five States, viz., Gujarat and Madhya Pradesh in the Western Region and Haryana, Punjab and Rajasthan in Northern Region. All these State Electricity Board/Utilities have been impleaded as Respondents in this case. The prayer is for approval of a two part tariff consisting of Fixed Charges and Fuel Charges. "The Fixed Charge component is proposed to be levelised for a period of 30 years at Rs.1.27/kWh without Flue Gas Desulpharisation Unit (FGD) or at Rs.1.35/kWh with FGD Unit, if stipulated by the indian environment regulatory authority." The term "tariff" used in this Order invariably refers to the fixed charges unless otherwise specifically recognised.

We have already issued a summary order on 5th September, 2000 on this petition reflecting our decision on the Tariff prayed for. Since we came to a conclusion on the tariff based on the assumption of sub critical boiler technology, we directed the parties concerned to assist the consultants viz., SBI Caps Ltd. to rework that tariff on the assumption of use of super critical boilers both at constant and current prices on 74 % and 88 % front loading of the tariff. Respondent No.1 communicated that since the tariff does not appear to them to be viable, they would prefer not to assist the consultants in doing this exercise. Consequently, the consultants did the working on their own. We express our strong disapproval of this attitude of Respondent No.1 particularly, because they had undertaken on affidavit that the Order of the Commission on the Tariff for this project shall be binding on them.

2. The Fixed Charge according to the petition is to comprise of two

   elements viz., Capacity Charge and Operation & Maintenance (O&M) Charge. Capacity Charge is to contain two components viz., US Dollar and Rupees in the ratio of 50:50 for the first 12 years and 25:75 in the next 18 years. The Dollar component is to be converted at prevailing exchange rates during the term of the Power Purchase Agreement (PPA). The fixed charge is to be based on guaranteed off take at 68.5 % Plant Load Factor (PLF) with incentive payment at 25 % of the Fixed Charge for any drawal above 68.5 % PLF. The incentive payment shall be convertible at Rs.35/- per US Dollar. The fixed charge includes income tax on ROE not exceeding 16% with applicable tax holiday. The fixed charge is also based on exemption from customs duty on imported Plant & Machinery. The O&M charge is to be indexed after fixing the same on the Commercial Operation Date (COD). The fixation is to be done by freezing the rupee component at 1 US Dollar is equal to Rs.35/- and the component converted into rupees at the exchange rate prevailing on the date of commercial operation of the Plant and the first escalation to be effective one year after the Commercial Operation Date (COD). CEPA was to achieve financial closure by 31st December, 2000 with liberty to parties to terminate the PPA or mutually agree for further extension in case financial closure is not achieved. PTC was at liberty to offtake power beyond the level of 68.5 % PLF and make sales to third parties after the payment of the incentive charges. Denomination of fixed charge component into dollar and rupees is on the premise that the project is financed through 100 % foreign exchange. In case of change, suitable alteration will be made in the tariff denomination. The tariff will be subject to adjustment on account of any statutory variation in taxes and duties or on account of change in law to be defined in PPA. The fuel charge component is to be based on net station heat rate as stipulated in the petition plus secondary fuel oil consumption to be based on average consumption obtaining in any NTPC's 500 MW Units excluding consumption levels of Units not operating at optimum level due to grid system conditions. For coal, cost at mine end and for secondary fuel oil cost at Free on Rail (FOR) Plant site would be the basis.

3. The petition narrates the various chronological events commencing

   from September, 1994 when a Memorandum of Understanding (MOU) between Power Grid Corporation of India Ltd. (PGCIL) and M/s Consolidated Electric Power Asia Limited (CEPA, Hong Kong) for purchase of power from the project was signed. Thereafter, the MoU was amended and PTC became the signatory in the place of PGCIL. CEPA also made different offers in December, 1996, August, 1999 and October, 1999. The Government of India announced a revised mega power policy in October, 1998. A Tariff Committee was constituted by the Government of India in June, 1999 which recommended revision of the Tariff proposed by CEPA. The validity of the MoU was extended up to 22nd September, 2000 and discussions were organised among PTC, CEA, Power Grid, beneficiary States/SEBs and the State of Orissa. The Standing Independent Group (SIG), constituted by the Government of India considered the recommendations of the Tariff Committee and ultimately in December, 1999 it suggested reference of the tariff finalising process to the Commission. Accordingly, this petition was filed on 31^{st} March, 2000.

THE INITIAL PROCEEDINGS

4. The petition was taken up for hearing on 5^{th} May, 2000 when it was found that the Respondent No.1 viz. M/s Consolidated Electric Power Asia Limited has changed its name. The Petitioner company was not agreeable for substituting the changed name of the Respondent No.1 and sought further time to react on this issue. Subsequently, on 31^{st} May, 2000 by an application, the petitioner company prayed for substitution of the name of Respondent No.1. This was allowed and the name of Respondent No.1 was substituted as Southern Energy Asia Pacific Limited (SEAP) with registered office at Cedar House, 41, Cedar Avenue, Hamilton HM12, Bermuda with its representative office in New Delhi. Thereafter the question regarding the jurisdiction of the Commission was discussed. The parties have agreed during the proceedings and through subsequent affidavits to abide by the tariff that will be determined by us. Accordingly, we decided to take up this petition under section 13(h) of the Electricity Regulatory Commissions Act which contemplates arbitration of disputes involving generating companies with regard to matters connected with tariff. We have also sought clarification regarding our jurisdiction in view of the mega power policy of the Government of India which contemplated a Standing Independent Group (SIG) as the apex body in respect of such projects to handle such matters. The Government of India has now confirmed through an Affidavit that SIG has ceased to exist. As such it is established that the commission has full jurisdiction to determine the tariff in respect of this project.

4. According to the CERC (Conduct of Business) Regulations, 1999 the

generation tariff is to be determined based on the actual cost of the project. In this case, however, the Commission is to determine the tariff in advance with the investment decision in the project to follow suit. In view of the fact that the Electricity Regulatory Commissions (ERC) Act provides for "regulation" of tariff, which has a wider connotation and that the Commission is mandated to promote investment, the Commission was convinced that it is necessary to determine the tariff in advance of implementation of the project. Such a process has also been contemplated in the Commission's Consultation Paper on bulk tariffs. In view of the above, Commission decided to proceed with the hearing of the petition.

5. M/s CEPA, in its reply filed on 1^{st} May, 2000 have dealt with issues relating to the admission of this petition wherein they have drawn the attention of the Commission to Regulations 79, 80 and 86. It has submitted that the Commission has jurisdiction to determine the tariff and that there is no conflict between the parties on this score. The reply has also underscored the need for urgent disposal of the petition on merits as the matter is long pending, it relates to the largest power project in India involving investment of between Rs.18000 to 20,000 crores and that there is an in-principle acceptance for contribution to infrastructure development in the State of Orissa. In addition, the Respondent has also sought directions for supply of certain documents relied upon by the petitioner company.

THE CONCILIATORY PROCESS

6. The Commission took up this petition more as a conciliation proceeding than adversarial proceeding in view of the broad agreement between the two parties to pursue this project. We therefore suggested that the parties should endeavour to narrow down areas of difference between them. It was suggested that an independent institution of experts may be appointed to interact with the parties with a view to resolving the differences between them. We directed the parties to furnish two panels of three technical and financial experts for this purpose and also specify the areas of agreement and disagreement. The areas of disagreement were to constitute the terms of reference for the experts. The cost incurred on account of the experts was to be shared equally between petitioner and respondent No.1. This approach was agreed to by all parties and the panels of names were also suggested by the petitioner and respondent No.1. It was also agreed that the experts appointed should not have been associated with the project at any stage and that if they had any dealings with any of the parties in the past, they shall also be disclosed. In pursuit of this approach, both the parties submitted names of experts in which the common name which featured was of M/s SBI Capital Markets Limited (SBI Caps). In the meanwhile, the terms of reference were also finalised with the involvement of Commission's staff. We also sought the consent of the parties that SBI Caps may associate appropriate technical consultants to look into the technical aspects. We further directed SBI Caps

to submit their quotation for the assignment so that the concurrence of the parties on the remuneration could be obtained. It was also decided that a public notice shall be given so that any person interested in making submissions in the matter could do so before the Commission. The time schedule for completion of the assignment and for hearing was also fixed.

At this stage of the proceedings in view of the consensus on the part of all parties the process of filing pleadings was left behind with the understanding that the parties would be given due opportunity to react on the consultants' report. At the hearings held on 28th and 31st July, 2000, all parties confirmed their agreement to the appointment, the terms of reference to SBI Caps and sharing of the fees payable. Before confirming the appointment of SBI Caps, the final offer of SBI Caps was brought to the notice of all concerned. It was explained that their initial offer of a fee of Rs.1.7 crores was further brought down to Rs.99.5 lacs inclusive of out of pocket expenses. The necessary concurrence to the appointment of SBI Caps including the involvement of M/s Black & Veatch Corporation of USA as Technical Consultants was given by all the parties. The necessary disclosures as sought were also made by the parties. After the concurrence of the parties, it was decided that the parties including state level beneficiaries may each designate a person to be associated with the consultants to ensure transparent and expeditious finalisation of the report. The Commission also took upon itself the task of reviewing the work of the Consultants in the presence of the parties with schedule for such review meetings. Dates for final public comments and objections were also announced. The entire proceedings were to be conducted in a transparent manner.

TERMS OF REFERENCE FOR CONSULTANTS

8. The terms of reference (TOR) for the Consultants were as follows:

i. CERC's order dated 21.6.2000 on Petition No.24/2000 directed appointment

of SBI Caps as Consultants for evaluation of the proposals of Petitioner and simultaneously match with the proposal of Respondent No.1 in order to arrive independently at the most competitive tariff and terms and conditions. The consultant may associate appropriate technical consultant preferably an Indian consultant. However, the overwhelming objective shall be the effective discharge of function as per the terms of reference and not their place of origin.

ii. The consultants will review the tariff contained in the petition filed by the PTC and hold discussions with the concerned parties to assist the bench in assessing the rival contentions of the parties. The areas of disagreement are as furnished by PTC in its submission of 10th June, 2000.
iii. In the light of the tariff objectives of Mega Power Policy of the Government of India, the consultants shall take into account the various policies, relief and concessions provided for evaluating the competitiveness of the tariff.
iv. Compare the fixed components of tariff of the Project at 68.5 % annual PLF/availability and also at 75%, 80% and 85% annual PLF/availability of Hirma Project with other CEA cleared coal based thermal power projects with appropriate correction for size and number of units, economies of scales and any other relevant issues as considered relevant by the consultants.
v. Study and suggest the reasonableness of tariff at higher operating levels of 75%, 80% & 85% duly taking into account the commitment made by the SEBs, and the avoided cost of electricity for the five off taking SEBs.
vi. Benchmark the Hirma tariff with any other competitively bid power project in India.
vii. Examine the various issues raised by the SIG as contained in the minutes of SIG meeting of 30th December, 1999, and analyse their impact on tariff with suitable recommendations.
viii. The consultants shall take up any other issues as directed by CERC with a view to properly assess the feasibility and competitiveness.
ix. The consultant shall furnish detailed reasons in support of any recommendation on above issues.
x. The consultants may seek any further clarifications/information required from the parties concerned and shall afford adequate opportunity to the parties before finalising the recommendations.

The terms of reference can be broadly identified as three major tasks to beperformed by the Consultants:

i. to independently arrive at the most competitive tariff and terms and conditions;
ii. to hold discussions with concerned parties with a view to narrow down the areas of disagreement.
iii. compare the fixed components of tariff with other Central Electricity Authority (CEA) cleared coal

based thermal power projects of considerable size and scale, including suggesting reasonable tariff at higher operating levels above 68.5%. This is to be done in the context of the mega power policy of the Government of India.

THE APPROACH OF CONSULTANTS

8. The Consultants have reported the following steps on taking up the assignment-

a. Appointment of M/s Black & Veatch International Co. of USA to obtain assistance on the indicative pricing, cost estimates, recommendation of boiler technology including a techno-economic comparison between super and sub-critical boilers and examination of the impact on fixed and variable charges based on station heat rates, operations and maintenance expenses as well as comparison of the proposed project with other coal based projects after appropriate corrections.
b. Series of extensive discussions with the petitioner and the respondents on the rival contentions between the parties.
c. Examination of various documents to

i. assess the rival contentions of the parties including detailed project reports. The process also included a study of the application of Lahmeyer's curve for economy of scale.
ii. in order to assess the competitiveness of the tariff proposal in the light of the mega power policy and comparing fixed components of the tariff at various PLF/Availability levels with other CEA cleared coal based thermal power projects, the relevant documents relating to the comparable projects were also studied.

The Commission's staff attended various meetings organised by

the Consultants between the parties. The Commission also reviewed the progress of work of the Consultants four times during the course of evaluation.

AREAS OF AGREEMENT BETWEEN PARTIES

9. SBI Caps have reported the areas of agreement which form the basis for the final tariff offer by SEAP, which are as follows:

- The tariff will comprise of fixed charges and variable charges.
- Fixed charges shall comprise of capacity and O&M charge
- Fixed charges will be based on an annual take or pay level of 68.5% PLF
- Fixed charges will be denominated in US$ & Rupees in the ratio of 50:50 in the first 12 years and 25:75 in the remaining 18 years
- The Rupee component of fixed charges will be converted at 1 US$ = Rs.35
- Merry Go Round (MGR) cost and Operation and Maintenance (O&M) charges on the same are included in the fixed charge component of tariff
- Capacity charges will be fixed and not subject to indexation
- For power sold above 68.5% annual PLF level, an incentive @ 25% of total fixed charge will be payable in Indian Rupees only and no additional O&M charge will be payable. Incentive charges will be converted at 1 USD = Rs.35
- The fixed charge component of tariff is inclusive of income tax limited to Return on Equity not exceeding 16% of the equity
- Dividend tax, if any, would not be a pass-through
- Tax on other streams of income, if any, payable by SEAP will also not be pass-through in tariff
- Fixed charge component is based on the custom duty exemption as per the Indian Mega Power Policy
- There would be a mechanism for tariff adjustment on account of variaitons in statutory taxes and duties (change in law) from the levels assumed by SEAP. The detailed assumptions on taxes & duties and underlying SEAP's offer are annexed as Exhibit 1 of SEAP's offer letter.
- SEAP would be allowed the right of sale of power to third parties subject to first right of refusal by Respondents 2-6
- The tariff as per SEAP's latest offer of October, 1999 (subject to areas of disagreement) at a guaranteed availability of 68.5% is as below –

PLF 68.5%	**YEARS 1-12**	**YEARS 13-30**
Capacity Charges	(US 2.159 cents + Rs.0.756)/kWh	(US 0.302 cents + Rs.0.317)/kWh
O&M charges	Rs.0.074/kWh	Rs.0.074/kWh
Levelised Charges	**US 3.4431 cents/kWh, viz. Rs.1.4633/kWh**	

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POINTS OF INITIAL DISAGREEMENT

10. The points of initial disagreement which are set out in Chapter IV of the Report are tabulated below:

Sl. No.	ISSUE	PTC'S STAND	SEAP'S STAND
01	Boiler Technology	Use of Super Critical Boilers as recommended by CEA	Strong reservation against Super Critical Boiler
02	Fixed Charge Component	Levelised Fixed charge of Rs.1.27/kWh without FGD or Rs.1.35/kWh with FGD with two elements viz., Capacity Charge and O&M limited to 5% of capacity charge for 30 years. Indexation to be limited to O&M only.	Fixed Charge at minimum guaranteed off take at 68.5% with two levelised streams of 1-12 years and 13-30 years at Rs.1.7475 and Rs.0.5185 per kWh levelised at Rs.1.4633/kWh for the 30 year period.
03	Operation & Maintenance Charges	To be limited to 5% of capacity charges Or Charge of 0.21 cents converted at the Exchange Rate on COD of 1st Unit with GOI Indexation Rates Or 2% of actual project cost with Indexation as per GOI Rates	Offered 4 alternatives viz., 0.21 Cents converted at current rates and Indexed Or 0.21 Cents converted on COD of Unit 1 and indexed as per GOI Rules Or 2% of actual project cost (including insurance) and indexed as per GOI Rates OR 2.5% of project cost and indexed as per GOI Rules
04	Additional Indexation for Delay in Financial closure	All conversion to be done at Rs.35/- to a Dollar with option to terminate MoU if financial closure is not done by 31.12.2000 or to	Sought adjustment in exchange rate of Rs.35/- for escalation in Exchange Rate after 31.12.2000.

		extend the contract on fresh terms	
05	Front Loading of Tariff	To be limited to 70/74%	Extending the Loading upto 88 %.
06	Availability Vs. PLF	Fixed Chargaes payable at guaranteed off take of 68.5% PLF	Take pay at 68.5% PLF
07	Adjustment for Taxes and Duties for Statutory Variation	Acceptable to any variation due to change in law.	Listed Taxes and Duties for which adjustment sought
08	Means of Financing	Should be 100% Foreign Exchange, if changed suitable tariff adjustment to be done.	Not agreeable. If so desired, PTC can bear the extra exchange rate variation risk
09	Average Net Station Heat Rate (NSHR)	Actual of the previous year. For the 1st year it shall be the actual with a ceiling as per Manufacturers Load Curve for Super Critical Boiler	Opposed to Super Critical Boiler
10	Cost of Coal/Oil	Coal cost at Mine end. Fuel oil – FOR at plant site with Fuel Supply Agreement to be approved by PTC	Cost of coal should be at loading point of MGR
11	Secondary Fuel Oil Consump-tion	As per NTPC's normal consumption for 500 MW Units with exceptions.	Formally disagreed.

CONSULTANTS' ASSESSMENT OF PROJECT COST & TARIFF

11. The first major task as per the TOR is to independently arrive at the

competitive tariff for the project. In order to arrive at a bench mark level of tariff with a view to verifying independently the competitiveness of the tariff offered, M/s Black & Veatch were required by SBI CAPS to estimate the likely capital cost of the project. Based on the cost estimates, SBI Caps developed an optimal financing plan for the project based on the current market conditions and considering the size and nature of the project. Thereafter, the operating norms of the Government of India for MoU based project were applied to arrive at the resultant indicative tariff level. Of course, they did not do an independent study on operational cost based on the capital cost but took the Government of India norms as granted.

The total cost estimate for the project as per M/s Black & Veatch

works out to Rs.20,477.4 Crores (without Taxes and duties) amounting to a capital cost of Rs.4.74 Crores per MW based on gross capacity. The details of the EPC turn key cost are set out in the report. The Engineering Procurement Construction (EPC) cost includes the Merry Go Round (MGR) system including rolling stock and the environmental requirement of Flue Gas Desulpharisation (FGD) unit. The non turn key cost and overheads to the extent of 4.5 % of the project cost were included which in other projects is approximately 5%. The size of the project justifies this disparity. The land cost has been taken from the

Draft Project Report (DPR) already submitted. The duties and taxes (except works contract taxes) have not been considered for estimating the project cost and in case the duties and taxes are actually made applicable, the tariff would have to be increased. SBI Caps on their experience and keeping in view the market conditions have worked out the financing cost and Interest During Construction (IDC). Based on the above project cost estimate, the fixed charge component of tariff has been determined by applying the GOI guidelines as follows at the various operating levels:

PLF ESTIMATED FIXED CHARGE

PER KwH AT CONSTANT PRICES

AT 100% AT 95% AT 90%

ESTIMATIED ESTIMATED ESTIMATED

CAPITAL COST CAPITAL COST CAPITAL COST

68.49% Rs.1.8504 Rs.1.7609 Rs.1.6714

75% Rs.1.6912 Rs.1.6094 Rs.1.5277

80% Rs.1.5865 Rs.1.5098 Rs.1.4332

85% Rs.1.4940 Rs.1.4219 Rs.1.3498

It may be noted that estimation errors have been contemplated upto 10 %. The two prominent figures thrown out by the independent study are the Capital Cost per MW and the Fixed Charges per kWh at 85% PLF. Though the SEAP offer is a stand alone tariff irrespective of the costs, the figures independently arrived at can be used to assess whether there is any abnormality in the project cost and tariff. For this purpose, it is necessary to compare the capital cost per MW independently arrived at with the capital cost of comparative projects. This comparison is reflected in the following table:

Comparison of Project Costs with Taxes and Duties

Sl No	Name of Project	Capacity MW	Date of Clearance	Project Cost: Fgn.Curr.Mn.	Ex rate	FC in Rs Crs	Indian in Rs Crs	Total	Cost/MW Rs Crs
1	North Madras (Vediocon)	1050	3/04/96	585.96	34.50	2021.56	2402.24	4423.80	4.21
2	Mangalore	1000	10/07/96	751.57	31.50	2367.46	1580.89	3948.35	3.95
3	Vizag	1040	25/07/96	943.75	35.00	3303.13	1324.99	4628.12	4.45
4	Simhadri	1000	12/08/96	433.95	35.00	1518.83	2278.06	3796.89	3.80
5	Korba east	1070	30/12/96	863.95	35.50	3067.02	1623.04	4690.06	4.38
6	Cuddalore	1320	13/08/99			4318.72	2036.50	6355.22	4.81
			US $	488.19	42.00	2050.41			
			GBP	203.99	68.00	1387.15			
			FF	1258.81	7.00	881.17			
7	Hirma*	4320		3369.00	42.50	14318.25	6159.20	20477.45	4.74

*as estimated by BVI without taxes and duties

The above comparison has to be considered in the background of the fact that Hirma has the addition of FGD and MGR in the capital cost. With this background, it is clear that there is no abnormality in the capital cost.

Based on the above capital cost the tariff numbers evolved by

consultants reflects a levelised fixed charge of Rs.1.4940/kWh at the highest and Rs.1.3498/kWh at the lowest. As against this, the offer of SEAP at 85% PLF at constant prices is Rs.1.3981. This includes a cost of Rs.0.06 (app) for FGD Unit. As such, the tariff offer is within the zone of our consideration.

CONCILIATION ON AREAS OF DISAGREEMENT

12. Before proceeding to compare the Hirma tariff with other projects, it is

necessary to ensure that a consensus exists on various areas of disagreement. The consultants have reported that the disagreement has been narrowed to limit it to Fixed charges and the denomination of such fixed charges. As such we deal with the issues regarding areas of disagreement and how they have been reconciled.

13. A major task for the consultants as set out in the terms of reference relates to narrowing down the areas of disagreement between the parties through a process of discussion with the active involvement of the technical consultants M/s. Black and Veatch. The consultants have reported on the conciliation efforts after detailed discussions on the various areas of original disagreement as follows:-

i. On boiler technology: SEAP has agreed to implement the project with super-critical boiler. However, it requires additional time of 3 months to implement the first unit i.e. from 36 months to 39 months from financial closure and has agreed to bear any increase in financing charges due to the delay in implementation schedule beyond 36 months. As per the consultants' analysis the use of super critical boiler would lead to a marginal increase in levelised fixed charges and reduction in the levelised variable charges (excluding secondary fuel charges). The increase in fixed tariff is 0.74% at current prices. The use of super critical boiler is economically justified at PLF of around 80% and above. The technical consultants have recommended that super critical boilers are appropriate for projects of this size. In view of this, the issue regarding super critical boiler stands settled, though the beneficiaries have to commit fixed charges at 85 % availability.
ii. Fixed charge component of tariff: This issue is being dealt with separately hereunder. However, the following broad parameters for the purpose of fixed charges have been conceded by all the parties:-

   a. Guaranteed availability of 85%
   b. Guaranteed recovery of full fixed charges at 85% PLF including deemed generation, which is the same as `Availability'.
   c. Capacity charges of US Dollars per kwh, 46% of which would be converted into rupees at the current exchange rate and 54% would be converted at Rs.35 (rupee component for the first 12 years) after COD. The ratio would become 23% and 77% respectively for the years 13 to 30.
   d. O&M charges in US Dollars, 100% of which will be converted into rupees at the exchange rate prevailing on COD of unit 1. O&M charges to be indexed as per GOI guidelines.
   e. Incentives for despatch above 85% PLF would be calculated as 1 paisa per kwh for 1% increase in despatch above 85% PLF, 2 paisa per kwh for 2% increase in despatch above 85% PLF and so on.

i. Indexation of O&M charges: After exploring various alternative options for indexation of O&M charges there appeared to be a consensus that the O&M charges in US Dollars be converted into rupees at the exchange rate prevailing on the COD of unit No.1 and thereafter indexed as per GOI guidelines. The consultants in their report have also recommended this procedure after considering all the alternatives and also taking into account the O&M charges independently arrived at by the technical consultants. We are in agreement with the recommendation of the consultants.
ii. Indexation of SEAP's offer due to extension of financial closure - In view of considerable time having elapsed since the initial tariff offer of SEAP, the consultants have considered it appropriate to provide for indexation on the rupee component of the capacity charge. The consultants have devised the

following structure for indexation: A milestone date of 30th June 2001 has been determined for signing the following agreements namely, power purchase agreement between SEAP and PTC and between PTC and the 5 SEBs, fuel supply agreement, the implementation agreement (State support agreement), and security package. The rate of Rs.35 per US Dollar would constitute the frozen exchange rate. This frozen exchange rate could be indexed further based on the depreciation of the rupee versus the US dollar as per the formula given below:-

- Base exchange rate would be the simple average of the SBI TT buying rates for the period from 2 working days before and 2 working days after the milestone date.
- The formula for calculating the indexation amount would be

$$\frac{(\text{Depreciated exchange rate} - \text{Base exchange rate})}{\text{Base exchange rate}}$$

- The depreciated exchange rate would be SBIs TT buying rate for the period 2 working days before and 2 working days after the new indexation date.

  The new indexation date would be: earlier of the date of financial closure and the date falling12 months after the milestone date or a date falling 12 months after the actual date of signing the last of the 4 agreements referred to above if such date is later than the Milestone date. The frozen exchange rate would be indexed accordingly on a percentage basis. In case the indexation amount is negative no adjustment would be made to the frozen exchange rate. We agree with the recommendations of the consultants and there are no objections from any of the parties.

i. Front loading of tariff: Front loading of tariff to the extent of 74% is a feature which has been found in all the comparable projects. All the beneficiary states have uniformly agreed to a front loading upto 74%. However, during discussions, looking to the attractive tariff after 13 years which probably was the consequence of the tax advantage accruing to the generator, some of the SEBs indicated their willingness to accept upto 88% front loading. At the same time apprehensions were expressed that if the tariff is so heavily loaded at the front, in the subsequent period the generator may not have any commitment to run the project to the imperilment of the beneficiaries. This apprehension however has to be addressed appropriately in the power purchase agreement and this cannot be a tariff issue. The consultants have presented the tariff structure at both 74% and 88% front loading. We have also considered it appropriate to leave it to the parties to opt upto 88% front loading on a consensus basis for which liberty has been given. On a comparable basis therefore we have determined the tariff at 74% front loading in line with all comparable projects, and as agreed to by all the parties. It should be noted that the levelised tariff at 74 % front loading is at current prices and figure derived from the offer figure.

ii. Availability versus plant load factor: After detailed deliberations by the consultants with the parties a consensus regarding 85% availability with guaranteed off-take at this operating level has been arrived at. The tariff has also been determined accordingly. This in turn means that the beneficiaries shall pay fixed charges at 85% availability irrespective of the actual off take.

iii. Mechanism for tariff adjustment on account of statutory variations in taxes and duties: A major apprehension for investors in mega projects is the continued availability of total exemption from customs duty in respect of import of plant and machinery for the project. This concession is part of the Revised Mega Power Policy of the Government of India. One of the areas of disagreement is that in case the exemption from customs duty is withdrawn in the process of execution of the project, as to who should bear the financial impact of the duty. It was the contention of SEAP that a heavy financial outgo of this magnitude cannot be borne by them. PTC on the other hand has no objection to such financial impact being recovered through tariff over a period of time; however, it is not willing to pay this amount in one go. The parties are also reported to have explored the possibility of getting an assurance from the Government of India regarding the certainty of the concession being available for this project. However, no definite assurances could be obtained.

   The background of the concession of waiver of import duty is the larger policy decision of the Government to encourage private sector participation and foreign direct investment in the power sector. It has also been recorded that power sector development is the key to economic development of the country. In fact the Government has gone to the extent of permitting 100% foreign direct investment in the power sector without going through the formal approval route. Looked at from this background there should be no apprehension that this concession would be withdrawn abruptly. Further the gestation period being about 4 years the possibility of reversal of the policy in such a short time appears remote. All the same the apprehensions of the investor must be dispelled. **We therefore consider it appropriate to advise the Government that a clear ruling on the availability of the duty concession for this project may be considered as an advance ruling so that the investor can be assured of the availability of this benefit in the interest of ultimate consumers. We strongly recommend this advance ruling by the Ministry of Finance for which appropriate steps may be initiated by the Ministry of Power in the larger interest of the power sector. A copy of this order shall be forwarded to the Ministry of Power and the Ministry of Finance, for this purpose.**

As regards corporate tax, the investors have based their tariff offer assuming the tax holiday available under Section 80 (IA) of the Income Tax Act 1961. According to this provision 100% of the taxable profit is deductible from the income for the first 5 years and 30% of the profit in the next 5 years. It is also open to the assessee to choose the initial assessment year from which the tax holiday begins so that it does not fall beyond the 15^{th} assessment year starting from the previous year in which the undertaking generates power. The tariff offer is obviously based on the optimisation of the corporate tax benefit to the company in the initial years. It is due to this that SEAP had been advocating higher front loading of the tariff. However, a heavy front loading should not result in large proportionate rate of post tax returns in the initial years and thereby resulting in a much lower post tax return on equity in the later years. The implication is that if the income tax has been collected upfront in the initial years and subsequently the tax is reduced due to change in tax laws, there should be an adjustment for the tax benefit in the later years. However, this is purely a PPA issue which is to be taken care of at the time of signing the PPA. As such, the consultants have recommended a general clause to be incorporated in the PPA that "in the event of the underlying assumptions for computation or exemption in tax, duties etc. being incorrect due to mis-interpretation/mis-classification of the items, the increased burden of taxes would have to be borne by the party who has erred in the judgement". We are in agreement with this recommendation of the consultants and accordingly we leave this issue to be appropriately taken care of by the parties in the PPA.

iv. Means of financing: The stand of PTC is that the denomination of fixed charges component of tariff is based on the premise that the project is financed through 100% foreign exchange (debt/equity). Accordingly denomination of fixed charges in US Dollars and Rupees into 50:50 in the first 12 years and 25:75 in the subsequent 18 years which stands revised to 46:54 and 23:77 is justified. However, if there is any change in the financing of the project, suitable adjustment in the denomination of the fixed charge component is necessary. This contention of PTC is opposed by SEAP on the ground that the funding and the foreign exchange risk in the project lie with the project company. As such it will not be appropriate to enter into a negotiation on the means of financing which should be left totally to the investor. However, SEAP was willing to allow PTC to take the entire risk on foreign exchange rate variation in case they chose to do so.

The question of change in the composition of the denomination of fixed charge component consequent to the possible change in means of financing was also raised by the Gujarat State Electricity Board. The consultants have ultimately recommended that the denomination of fixed charges in US dollar and rupees may not be linked to the financing mix ultimately achieved by SEAP. As such this issue remained unresolved.

We have given a careful consideration to the issue raised. We find that the comparable projects and even other Public Sector Undertakings (PSU) projects in India are financed by both rupee and foreign exchange currencies. It is also the normal practice that the beneficiaries have to bear the exchange rate variation in respect of both principal and interest payments on the foreign loans as well as dividend on foreign equity limited to 16 %. We do not therefore find any reason as to why the same treatment should not be accorded to this project also. The merit of this project on the other hand is that even though the entire financing is to be done through foreign exchange, only a part of the fixed charges is designated in dollars and the balance is designated in rupees. To that extent the consumers are benefited. At the same time it can be seen that the foreign exchange component in this project tariff is higher than that in comparable projects. As such when comparison at current prices is made the economics of tariff from this project takes an adverse turn. However, this cannot be helped. In the circumstances we are in agreement with the consultants in principle. In our view, so long as SEAP is the promoter of this project, the denomination of the tariff in US dollar and rupees should not undergo a change depending upon the means of financing adopted. In case of any change in the promoter of the project resulting in a change in means of financing the same should be subject to our approval when this issue can be considered once again.

v. The average net station heat rate (NSHR): There did not appear to be any serious controversy between the parties on this score excepting that SEAP had initial reservations on the use of super critical boiler technology. The technical consultants are reported to have studied this matter in detail and have recommended a net station heat rate of 2411 Kcal/kWh at 100% load (including degradation) for super critical boilers subject to the heat rate Vs. output curve as given by the technical consultants. There does not appear to be any conflict between the parties on this recommendation of the technical consultants. In view of this we approve this heat rate without prejudice to the Commission prescribing its own norms for other regulated entities as this is an agreed position between the parties.

vi. The cost of coal: The cost of coal has also not been a seriously contended issue. It appears that the parties have arrived at a consensus that this cost may be calculated at the loading point of the MGR system. We also consider this recommendation of the consultants as appropriate. Similarly the cost of secondary fuel oil shall also be on FOR basis at plant site.

vii. Secondary fuel oil consumption: This also does not appear to be a

seriously contested issue. In any case the technical consultants have examined this in detail and have suggested levels of consumption for various types of start ups in their report which appear to be fair and reasonable and as such shall be adopted.

The above review of the conciliation efforts of consultants has produced an agreed/settled base for assessing the tariff and to compare such tariff with other comparable projects.

COMPARATIVE STUDY OF TARIFF OFFER AT CONSTANT PRICES:

14. The next exercise is to compare the tariff offer with the CEA cleared coal based thermal power projects in the context of the mega power policy. For this purpose, the consultants have selected six projects techno economically cleared by CEA viz., (1) Korba Thermal Power Station (2 x 520=1040 MWs); (2) Vishakapatnam Thermal Power Station (2 x 520=1040 MWs); (3) Simhadri Thermal Power Station (2 x 500=1000 MWs); (4) Mangaore Power Project (4 x 250=1000); (5) North Madras Thermal Power Project II (Videocon) (2 x 525=1050 MWs); (6) Cuddalore Thermal Power Project (2 x 660=1320 MWs). The comparison is limited to the Fixed Charges only. The variable cost is to be decided on normative heat rates on actual fuel cost.

The above projects were selected based on the consideration of type of fuel, size of project i.e. 1000 MWs and above, Unit size mostly 500 MWs and information availability.

The comparison of the projects has been done under two scenarios namely:

1. Upscaling of all comparable projects and introducing MPP benefits to them and
2. Keeping the scales of projects as they are but assuming MPP benefits for all.

The first scenario is intended to reflect the inherent merits in any project, scales being the same. However, the process of upscaling has possibilities of error in assumptions. The second scenario is intended to reflect the merits of scale advantage in their respective projects since the mega power benefits are assumed for all the projects.

Since the parties have already agreed on off-take of power at 85% availability it is unnecessary for us to compare the tariff at other levels namely 75% and 80% which information has also been submitted by the consultants. SEAP in their offers have always been submitting the tariff in two streams namely first 12 years and subsequent 18 years. These streams have also contained US Dollar and Rupees denominated charges. As such, SEAP’s offer at 74 % Front Loading has been at current prices and not at constant prices. The Consultant’s however have de-escalated the current prices to constant prices by removing the escalation factors as assumed by them. As such, the tariff of 74% front loading at current prices when de-escalated may not result in the same extent of front loading. However, the consultants have presented these figures as comparable ones in their tables. Accordingly tariff of the other projects have been compared with the derived figure from SEAP’s offer. It is learnt that the margin of error in this adjustment is not material.

We take up first for consideration the comparative data at constant prices for drawing our conclusions.

COMPARATIVE LEVELISED TARIFF AT CONSTANT PRICES*

(With Upscaling) (Rs./kWh

Project/PLF # #	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer**
68.49%	1.7454	1.7988	1.9114	1.4333	1.4170	1.6123	1.6842	1.6442
85%	1.4095	1.4525	1.5432	1.1580	1.1448	1.3022	1.3601	1.3981

Including deemed generation

*Extract from page 15 of the Supplementary Report dated 2.9.2000.

**Derived figure from the corresponding current prices data after adjusting for escalations.

The above statement has put Hirma Project and the comparable

projects on the same footing both in respect of size, specifications as well as in respect of mega power policy benefits so that the difference, if any, in comparison would clearly reflect the inherent economies of the respective projects.

Yet another comparative study made by consultants is to compare the actual tariff of all the six projects with the offer from SEAP without adjustment for the size of the projects so that the economies of scale if any would be clearly reflected. This has been done with two assumptions viz., extending the mega power benefits to all the projects and without extending the benefits. Since a meaningful comparison on scale can only be by reflecting the scale differences by assuming MPP benefits for all, such exercise was attempted. The comparison showed the following results:

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COMPARATIVE LEVELISED TARIFF AT CONSTANT PRICES (Rs./KwH)*

(Without Upscaling and with MPP Benefits)

Project/PLF# #	Korba	Vizag	Simhadri	Mangalore	Videocon	Cuddalaore	SEAP's**
68.49%	1.8440	1.7097	1.5436	1.9328	1.6672	1.6689	1.6442
85%	1.4886	1.3808	1.2465	1.5612	1.3470	1.3474	1.3981

Including deemed generation

* Extract from page 16 of the Supplementary Report dated 2nd September, 2000.

**Derived figure from the corresponding current prices data after adjusting for escalation.

APPRAISAL OF PROJECTS AT CONSTANT PRICES

15. The above comparison has to be understood and interpreted in the context of the mega power policy of the Government of India which was revised in 1998. The policy has contemplated Hirma Project as one of the Mega Power Projects to be taken up. The Policy also contemplates adoption of principles of competitive

bidding as far as possible while obtaining tariff offers. It is also anticipated that economies of scale of mega projects would substantially bring down the tariff and thus provide relief to State Electricity Boards from rising tariffs. The large projects are to be set up at viable pit head sites, to eliminate unnecessary movement of fuel. In the light of these expectations, it is necessary to compare and confirm that the benefits as contemplated in the policy have really fructified while approving the tariff of this Project.

The comparison after upscaling of the comparable project costs brings out in bold relief that the SEAP offer of levelised tariff is higher than the adjusted levelised tariff of four projects viz., Simhadri, Mangalore, Videocon and Cuddalore. These disparities need to be analysed in order to convince ourselves about the competitiveness of the SEAP offer. In this connection, the following justifications are available in the Consultants report:

1. In the opinion of Black & Veatch, there may be a higher margin of error in upscaling the Mangalore project from a unit size of 250 MWs to 660 MWs.
2. In case of Simhadri, it is an NTPC project using a package wise contract approach. The liquidated damage (LD) provisions are much lower and there is no single point responsibility for implementation. Although such an approach may lead to lower hard costs still the IDC would be higher since the implementation schedule is longer.
3. In case of Videocon project being an extension project, it has been reported that there are certain shared facilities with the beneficiary state for which adjustment has been made in the capital cost resulting in the two projects not being strictly comparable.

4. In case of Cuddalore project, it has been reported that there is an additional jetty facility for handling coal which is absent in Hirma project, which upsets the comparison.

The comparison of actual tariff of each of the comparable projects with SEAP’s offer (no table provided) after adjustments demonstrates a clear advantage in favour of Hirma Project except in relation to Simhadri. Still this advantage cannot be carried too far. This is particularly because the comparable projects do not have the MPP benefits of duty. Hence instead of making such a comparison it s appropriate to assume that all the comparable projects are allowed the MPP benefits of duty and then compare with SEAP’s offer without upscaling. In other words, the comparison should bring out the inherent benefits of efficiency if any and the benefits of scale since the entrepreneur is different and the size of the project is different. Such a comparison is more meaningful and realistic. This is reflected in the table shown above at constant prices. The ranking in this case at 85% availability is as follows:

1. Simhadri : Rs.1.2465/kWh

2. Videocon : Rs.1.3470/kWh

3. Cuddalore : Rs.1.3474/kWh

4. Vizag : Rs.1.3808/kWh

5. SEAP : Rs.1.3981/kWh

It can be clearly seen from the above ranking that the Simhadri project comes out in bold relief as most economical as far as fixed charges are concerned, though Videocon and Cuddalore are also competitive enough.

The gap with the Vizag Project is insignificant.

Regarding the Simhadri project, the consultants have pointed out that this being an NTPC project, it enjoys a number of cost advantages over a normal IPP Project due to the package approach to contracting, inhouse engineering, less stringent LD proivsions, balance sheet funding, longer time frame etc. Further adjustments for the following parameters are required to be done in order to meaningfully compare with Hirma Project:

- Foreign-domestic equity ratio – 50:50
- Implementation time:36-39 months for Units I & II
- Financing Costs based assumptions for other IPP Projects.
- EPC cost 10 % increase in the works cost as per TEC. Though this is an indicative figure, the

actuals would depend on the risk factors and performance assurances.

- Based on analysis of TECs of projects under comparison, the EPC costs of IPPs are approximately 15-20 % higher than the works cost of Simhadri project. Hence adjustment has been done for works cost increase in a range of 7.5 % to 15 %.
- Adjustment for cost of FGD and MGR

After considering all the above differences, the consultants have

reported that an NTPC Project is not an ideal yardstick for comparison.

Though the above distinctions do warrant recognition, all the same, from the ultimate consumers point of view, it is necessary to examine whether there is scope for obtaining cheaper bulk power than from the proposed project. It appears that all the above merits which are available for an NTPC project could be preserved in case a public sector company like NTPC or it could itself take up such a project. This may be in the interest of the ultimate consumer which should be the test for judging the competitiveness of the project. However, we have to be realistic as to the practicability of taking up a project of such size as Hirma by the public sector power company. It has been found that the programme of NTPC as per Corporate Plan is to expand their capacities over the next 12 years totals upto 20000 MWs (approx) thereby, making an average of less than 2000MWs per annum. A look at the expansion actually done by NTPC in the past shows that the average capacity expansion had not been more than 1100 MWs per annum. Consultants have also reported that given the NTPC's balance sheet size of around Rs.30,000 crores and its debt service obligations, it does not appear probable that NTPC would be in a position to undertake financing and execution of projects of such size and magnitude. We agree with this observation. We however, hasten to add that this does not in any way adversely reflect on the capability or managerial expertise of NTPC to handle such large sized projects, but it recognises its financial and organisational limitations as at present.

The Government of India has enunciated a policy in 1991 allowing private enterprise a larger role in the power sector. This was recognised because of the limitations in giving budgetary support to public sector undertakings due to the growing demands from other sectors. Certain major policy initiatives were also taken to promote private participation in the power sector including 100 % foreign equity participation on the automatic approval route. Another possibility is that of a joint venture project with a PSU as a partner. The financial limitations of the PSUs do not give the confidence that they can become equal partners in a project with size of this magnitude. Further there is also the need for more projects of this size tomeet India's growing needs. In the circumstances, we consider it inappropriate to compare the economics of this project with a PSU promoted project of a smaller size. It may therefore be proper to only consider whether economies are available in this project with reference to IPPs which in this case happen to be the Videocon and Cuddalore Projects.

Videocon and Cuddalore projects when adjusted for mega power project benefits result in a levelised tariff (fixed charges) of Rs.1.347/kWh as opposed to SEAP's offer of 1.398/kWh. It has already been noted that there are certain common facilities in case of Videocon project which may have a favourable impact on cost. Regarding Cuddalore project, comparability is distorted due to the jetty facility for handling the fuel. Apart from these distortions, it is also necessary to note that there are differences in the project cost due to the inclusion of the MGR system and the FGD in Hirma Project. As per the petition, FGD cost alone at 85 % PLF works out to 6 paise per kWh. A comparison between the Videocon and Cuddalore project and the SEAP's offer reflects a difference of 5 paise per kWh and hence there is a difference of about 1 paise per kWh. In addition, the technical consultants have clearly brought out that there is a further saving in fuel cost on account of the use of super critical boiler, which can neutralise the marginal additional cost in the project to the extent of 0.74 %. Hence the SEAP's offer is clearly better than the tariff of Videocon and Cuddalore projects at constant prices. However, it may be argued that the ultimate consumer may not be strictly concerned with the environmental benefits of using super critical boiler but may be concerned with the net cost of the power supplied to him. Further, we have also to keep in view that in the cases of Videocon and Cuddalore, the cost of transmission and the management fee for PTC may have to be matched against the transportation cost of fuel. Since the mega power policy contemplates pit head plants, the present project carries this advantage which has to be matched against the avoided cost on account of transportation etc., in case of Videocon and Cuddalore.

In this background as against the Tariff of Rs.1.3981/kWh (derived) offered by SEAP, consultants have finally recommended a levelised tariff of Rs.1.3646/kWh at constant prices, which is still marginally higher than the tariff of comparable projects. No justification is available for this recommendation. According to the consultants, this tariff is equivalent to Rs.2.2628/kWh at current prices. Both these recommendations are on the assumption of sub critical boilers which need to be adjusted for super critical boilers, in which case the tariff will be higher by 0.74%.

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COMPARATIVE STUDY OF TARIFF AT CURRENT PRICES

16. The above comparison of tariff numbers is based on the assumption that the existing exchange rate between rupee and dollar would remain constant and no adjustment for inflation of O&M is required. This however is not a realistic assumption. All the comparable projects are also financed by foreign currency loans/equity and there is bound to be impact on tariff due to exchange rate variation in future. In case of Hirma project as already stated a part of the fixed charges is designated in dollars which will have to be converted at the exchange rate that will prevail at the time of the actual payment of tariff. Therefore, it is only appropriate to project the future tariff for both Hirma and comparable projects based on the past experience of exchange rate variation and inflation rates in India and USA. The consultants have carried out this exercise based on the assumption of an annual depreciation of the rupee at the rate of 5.9% per annum and assuming the inflation rates of 6% per annum for Wholesale Price Index (WPI) and 7% per annum for Consumer Price Index (CPI) and US inflation rate at 2% per annum. These assumptions have enabled the consultant to project the tariffs in the future years converted at the anticipated exchange rates commencing from the first year of operation. In fact they have derived the constant tariff numbers from the projected current tariff numbers supplied by SEAP at 74 % front loading. A similar exercise has been carried out in respect of comparable projects also. The comparative charts of tariffs at current prices reflects both these (a) by upscaling the comparable projects and (b) not upscaling but assuming MPP benefits for comparable projects. The two comparative tables one after upscaling and the other without upscaling but providing MPP benefits are reflected below:

COMPARATIVE LEVELISED TARIFF AT CURRENT PRICES*

(WITH UPSCALING) Rs/kwh

Project/PLF # #	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's** Offer#
68.49%	2.8267	2.9652	3.0769	2.1830	2.2425	2.5350	2.7400	2.8349
85%	2.2852	2.3968	2.4869	1.7666	1.8145	2.0502	2.2154	2.3575

Including deemed generation

*Extract from page 15 of the Supplementary Report dated 2nd September, 2000

**Levelised from the two streams of tariff for 1st 12 years and subsequent 18 years.

On upscaling the ranking of the projects is as follows:-

Simhadri	Rs.1.7666/kwh
Mangalore	Rs.1.8145/kwh
Videocon	Rs.2.0502/kwh
Cuddalore	Rs.2.2154/kwh
Korba	Rs.2.2852/kwh
SEAP's offer	Rs.2.3575/kwh

The above comparison shows that five of the six projects are above SEAP's offer. However the exercise of upscaling is not totally foolproof. Hence in order to see clearly the scale benefits a comparison keeping the scale as it is but adjusting for MPP benefits was carried out. This is reflected by the following table:

COMPARATIVE LEVELISED TARIFF AT CURRENT PRICES*

(WITHOUT UPSCALING) Rs/kWh

Project/PLF# #	Korba	Vizag	Simhadri	Mangalore	Videocon	Cuddalaore	SEAP's Offer**
68.49%	3.2007	3.0765	2.1126	3.3541	2.6233	2.9745	2.8349
85%	2.5837	2.4844	1.7069	2.7123	2.1228	2.4012	2.3575

*Extract from page 16 of the Supplementary report dated 2nd September, 2000.

**Levelised from the two streams of tariff for the 1st 12 years and subsequent 18 years

Including deemed generation

Bhadravati has not been included as break-up of taxes & duties is not available

The following is the ranking of the projects based on the above table:

Simhadri	Rs.1.7069/kwh
Videocon	Rs.2.1228/kwh
SEAP's offer	Rs.2.3575/kwh

It can be seen from the above that Simhadri is distinctly most competitive though Videocon is also comparatively competitive. It is of course necessary to bridge this gap to the extent of the FGD provision in the Hirma project which brings down the SEAP's offer by 6 paisa per kWh at constant prices. Yet Simhadri and Videocon are competitive enough.

<u>APPRAISAL OF PROJECTS AT CURRENT PRICES</u>

17. We have to bear in mind that this distortion in numbers arises mainly

due to the tariff structure of Hirma as compared to the other two projects. In case of other comparable projects the content of foreign exchange in the tariff structure is relatively less. The Hirma tariff structure is already acceptable to the petitioner as well as to all other respondents. There is no prayer in the petition for altering their tariff structure to the level of comparable projects. There had been certain averments on the part of some SEBs that in case the financing pattern undergoes a change from 100% foreign exchange then a suitable adjustment in the dollar-rupee component of the tariff should be done. This argument however has been contested by respondent No.1 who says that this should be possible only if the beneficiaries are willing to take up the complete foreign exchange rate risk as applicable in other projects, which is not acceptable to the beneficiaries. The consultants have also recommended in their report that the denomination of fixed charges in US dollars and rupees may not be linked to the financing mix ultimately achieved by SEAP. During the discussions it was also pointed out that SEAP's offer is a **Stand-alone Tariff Based Offer** (STBO) and as such there is no scope for getting into the structure of the tariff. The petitioners have also not seriously pursued the contentions regarding change of the structure of the tariff. Of course, a technical correction which resulted in the denomination of US Dollar and Rupee at 46:54 has been already done by the consultants. Under the current prices, the consultants have recommended a levelised tariff of Rs.2.2628/kWh which is still higher than the levelised tariff of Simhadri and North Madras (Videocon). They have again given no justification. The figure needs to be revised for use of super critical boilers.

CONCLUSIONS AND JUSTIFICATIONS

18. The only project whose tariff appears to be most competitive is that of Simhadri. There has been a marginal difference in case of the Videocon project at current prices which when considered in the context of constant prices becomes immaterial once adjustment is made for the additional FGD installation for Hirma. Thus the comparison shows that NTPCs Simhadri project is the only project which has certain inherent advantages which have already been dealt with. We are also convinced that a repeat of Simhadri in the scale of Hirma project is not practicable to be handled by a public sector power company and as such it would be inappropriate to dispense with the Hirma project as non-competitive. Also, the fact that many of the comparative projets which are IPPs are non starters reflects their unacceptability to investors. All the same, it is found that the gap between Hirma tariff and that of Videocon is not fully bridged. Further, at constant prices the gap between Hirma and Cuddalore is also not fully bridged. It is necessary in the light of the mega power policy for us to be fully satisfied that there is a distinct scale benefit from the proposed project in terms of tariff. **Accordingly we consider it appropriate to determine the tariff of the Hirma project at a constant price of Rs.1.33/kWh towards fixed charges which shall amount Rs.2.2067/kWh at current prices based on subcritical boiler. It is necessary to record here that as against the SEAP's offer of Rs.1.3981 at constant prices the consultants have recommended a tariff of Rs.1.3646 at 74% front loading with sub-critical boilers. We find this recommendation is higher than the comparable projects of Videocon and Cuddalore which are at Rs.1.35/kWh (approx.) per kwh as such our conclusion of Rs.1.33 would make Hirma project most competitive compared to all the comparable projects except Simhadri which is considered as an exceptional case.**

The levelised tariff of Rs.1.33/kWh as determined by us at constant prices for sub-critical boiler, has to be translated to the equivalent number for super critical boiler. The equivalent figure for super critical boiler as worked out by consultants is Rs.1.3398. This again, has to be translated into Dollar and Rupee denomination for the first 12 years and the subsequent 18 years. This exercise has been carried out by the Consultants based on the methodology as adopted by SEAP for their earlier tariff quotation. Accordingly, the Dollar and Rupee denomination shall be as follows:

PLF 85%	Years 1-12	Years 13-30
Capacity Charges	(US 1.5545 cents+ Rs.0.6387)/kWh	(US 0.7241 cents + Rs.0.8485)/kWh
O&M Charges	Rs.0.0735/kWh	Rs.0.0735/kWh
Levelised Charges	US 3.4989 cents/kWh , viz. Rs.1,3398/kWh	

In arriving at the Dollar and Rupee denomination, the ratio has been kept at 46:54 respectively for the first 12 years and 23:77 thereafter. This correction from the original figure of 50:50 appears to have been done consequent basically to the incentives as originally contemplated above 68.5% PLF now being fitted into the fixed cost and translated in Rupee terms only. Hence the change in denomination. We approve this denomination accordingly.

As regards variable cost based on super-critical boiler, the average net station heat rate shall be 2411 Kcal/KWH at 100% load (including degradation) subject to the detailed recommendations of the Technical Consultants which constitute a part of the Consultant's Report dated 21st August, 2000 and the Supplementary Report dated 2nd September, 2000. The cost of coal shall be considered at the loading point of the MGR system. The cost for secondary fuel oil consumption shall be based on the levels suggested by the technical consultants in their report, which forms part of the Consultant's Report.

We have kept in view while comparing these tariff numbers that

respondent No.1 in its affidavits has stated that it has given a commitment to spend towards infrastructure development in Orissa after the project achieves commercial operation at US $5 million per annum per unit aggregating to US $30 million per annum over the entire 30 year period of the project amounting to application of roughly 4 paisa per kwh out of SEAP's earnings. Though full details are not available about this commitment, we consider this as an appropriation from the profits for which no further provision in the tariff could be made. As such we have not made any special provision on account of this commitment. We have also considered the fact that respondent No.1 is planning to take full advantage of the tax holiday by possible front loading of tariff. We have also allowed liberty to respondent No.1 to further front load the tariff to the extent of 88% if all parties concerned agree to this being done in which case the applicable tariff will be Rs.1.1788 as reported by the consultants based on our decision of Rs.1.33/kwh at 74% front loading with sub-critical boilers. For super critical boiler this shall be Rs.1.1875/kWh. In case there is no consensus for the 88% front loading the applicable tariff at 74% with super critical boilers will be Rs.1.3398/kwh.

In view of the scope for tax planning available in the project and in view of the fact that the norms are set for the next 30 years without any intervention by the regulator we are convinced that the investor has enough scope to economise on operations to further improve his rate of return. Any economies on account of efficiency improvement shall fully accrue to the investor. We have also kept in view that the Hirma project being a mega power project, in accordance with the policy announced by the Government of India it would be entitled to all the benefits of the payments security mechanism. This feature distinguishes a mega project from all other IPPs where escrow arrangements are the only resort. The security mechanism for mega projects is distinctly more superior than escrow arrangements. In the circumstances the tariff determined by us is both competitive and remunerative to the consumers and the investor. We have received very scanty response from the public in these proceedings. The responses received however have all uniformally emphasised the need for expeditious disposal of the petition as well as determination of competitive tariff. However, no generating company in public sector or private sector raised any issues. These aspects were kept in view by us in our conclusions.

OTHER TERMS AND CONDITIONS

19. We have already reached the conclusion that the appropriate levelised tariff for fixed charges shall be Rs.1.3398/kwh at 85% PLF with 74% front loading and with the use of super critical boilers. The detailed break up of this tariff for the first 12 years and the next 18 years both in rupee terms and dollar denomination has been set out earlier in this Order.

The above fixed charges are on the assumption that the project will be implemented as per the following schedule:

COD of first unit : 39 months from the financial closure

COD of subsequent units: At 3 months interval thereafter.

Any time escalation shall be at the cost of the promoter. The parties shall incorporate appropriate clauses to this effect in the PPA.

PTC shall file at an appropriate time a separate petition for their management fee. PTC shall also immediately finalise the requisite transmission arrangements with Powergrid Corporation of India Ltd. (PGCIL) for evacuation of the power from this project. PGCIL shall come up with an appropriate petition for determination of the transmission tariff.

This order shall be subject to the project complying with all legal requirements and approvals as may be required by law before the announcement of commercial operation. This order shall be valid provided the installation agreement, fuel supply agreement, power purchase agreement and payment security arrangements are concluded by 30th June, 2001 and financial closure achieved within 12 months of signing of the last of the above said 4 agreements. In case of any delay on any one of these agreements/arrangements parties are at liberty to seek extension of time.

Parties are given the liberty to seek any clarification on this Order in the process of implementation.

Sd/-	**Sd/-**	**Sd/-**	**Sd/-**
(A.R. Ramanathan)	**(G.S. Rajamani)**	**(DP. Sinha)**	**(S.L. Rao)**
Member	**Member**	**Member**	**Chairman**

New Delhi dated 26th September, 2000