

Petition No. 24/2000 dated 31st March 2000

before the

CENTRAL ELECTRICITY REGULATORY COMMISSION

in the matter of

6x660 MW HIRMA POWER PROJECT

**Supplementary Report
to Consultants' Report dated 21st August 2000**

Submitted by



SBI CAPITAL MARKETS LIMITED

202, Maker Tower E, Cuffe Parade, Mumbai 400005, India

2nd September 2000

FOREWORD

This Supplementary Report is submitted by the Consultants at the end of the process of Public Hearings, which were held at the CERC between 29th August 2000 and 1st September 2000.

The Supplementary Report presents and addresses the following -

- Typographical errors which inadvertently crept into the Consultants' Report
- Further clarifications sought by the Parties to the Petition
- Suitable revisions and additions to the Consultants' Report to take into account the discussions and deliberations during the process of public hearings
- Final Recommendations regarding Tariff and other issues

CORRIGENDA

(The page / paragraph numbers refer to those in the Consultants' Report of 21st August 2000)

Page No. 40

The tables giving the comparison between the estimated fixed charge component of tariff by applying the GoI guidelines for two part tariff (fixed and variable charges) for power projects as outlined in the GoI Notification dated 30th March, 1992 as amended from time to time and SEAP's offer should be read as follows -

PLF #	Estimated Tariff Using 2 Part Formula at Constant Prices			SEAP's Offer *	SEAP's Offer **	SEAP's Offer ***
	With EPC Cost as per B&V estimate	With EPC Cost at 95% of B&V estimate	With EPC Cost at 90% of B&V estimate			
68.49%	1.8504	1.7609	1.6714	1.4633	1.6442	1.5615
75%	1.6912	1.6094	1.5277	1.3652	1.5343	1.4570
80%	1.5865	1.5098	1.4332	1.3008	1.4619	1.3883
85%	1.4940	1.4219	1.3498	1.2438	1.3981	1.3276

Including deemed generation

* SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%

** SEAP's offer at 74% Front Loading at Current Prices

*** SEAP's offer at 84% Front Loading at Constant Prices

PLF #	Estimated Tariff Using 2 Part Formula at Current Prices			SEAP's Offer *	SEAP's Offer **	SEAP's Offer ***
	With EPC Cost as per B&V estimate	With EPC Cost at 95% of B&V estimate	With EPC Cost at 90% of B&V estimate			
68.49%	2.9776	2.8316	2.6855	2.4705	2.8349	2.4975
75%	2.7226	2.5892	2.4559	2.2851	2.6216	2.3118
80%	2.5549	2.4298	2.3048	2.1631	2.4813	2.1896
85%	2.4069	2.2892	2.1715	2.0555	2.3575	2.0818

Including deemed generation

* SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%

** SEAP's offer at 74% Front Loading at Current Prices

*** SEAP's offer at 84% Front Loading at Constant Prices

Page No. 41

The caption for the second table on the page no. 41, which presently reads as –

‘LEVELISED TARIFF COMPARISONS AT CONSTANT PRICES’

Should read as –

‘LEVELISED TARIFF COMPARISONS AT CURRENT PRICES’

Page Nos. 41, 42 and 43

Pursuant to feedback received from CERC, for optimization of tax benefits, depreciation earlier taken as per Straight Line Method was modified to Written Down Value method. Further, the assumption regarding foreign exchange protection for incentives were modified

to reflect the current position. Taking this into account, the revised tables reflecting the tariff figures of the projects under comparison are presented below -

Method 1 (Page 41)

Rs/KWh

LEVELISED TARIFF COMPARISONS AT CONSTANT PRICES										
Project PLF ##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	1.7454	1.7988	1.9114	1.4333	1.4170	1.6123	1.6842	1.4633	1.6442	1.5615
75%	1.5954	1.6441	1.7469	1.3103	1.2954	1.4738	1.5394	1.3652	1.5343	1.4570
80%	1.4966	1.5423	1.6387	1.2294	1.2154	1.3826	1.4442	1.3008	1.4619	1.3883
85%	1.4095	1.4525	1.5432	1.1580	1.1448	1.3022	1.3601	1.2438	1.3981	1.3276

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%

SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices

@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Rs/KWh

LEVELISED TARIFF COMPARISONS AT CURRENT PRICES										
Project PLF##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	2.8267	2.9652	3.0769	2.1830	2.2425	2.5350	2.7400	2.4865	2.8349	2.4975
75%	2.5848	2.7113	2.8133	1.9970	2.0513	2.3184	2.5056	2.2997	2.6216	2.3118
80%	2.4256	2.5442	2.6399	1.8746	1.9255	2.1759	2.3514	2.1768	2.4813	2.1896
85%	2.2852	2.3968	2.4869	1.7666	1.8145	2.0502	2.2154	2.0684	2.3575	2.0818

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%

SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices

@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Method 2 (Page 42 & 43)

Rs/KWh

ACTUAL TARIFF AT CONSTANT PRICES										
Project PLF##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	2.0075	1.8648	1.9966	1.6624	2.0637	1.8297	1.8619	1.4633	1.6442	1.5615
85%	1.6204	1.5058	1.6119	1.3423	1.6668	1.4779	1.5029	1.2438	1.3981	1.3276

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Rs/KWh

TARIFF WITH MEGA PROJECT BENEFITS AT CONSTANT PRICES										
Project PLF##	Korba	Vizag	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@	
68.49%	1.8440	1.7097	1.5436	1.9328	1.6672	1.6689	1.4633	1.6442	1.5615	
85%	1.4886	1.3808	1.2465	1.5612	1.3470	1.3474	1.2438	1.3981	1.3276	

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

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

Rs/KWh

ACTUAL TARIFF AT CURRENT PRICES										
Project PLF##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	3.4511	3.3202	3.2870	2.2533	3.5546	2.8685	3.2776	2.4865	2.8349	2.4975
85%	2.7855	2.6807	2.6539	1.8204	2.8738	2.3203	2.6455	2.0684	2.3575	2.0818

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Rs/KWh

TARIFF WITH MEGA PROJECT BENEFITS AT CURRENT PRICES										
Project PLF##	Korba	Vizag	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@	
68.49%	3.2007	3.0765	2.1126	3.3541	2.6233	2.9745	2.4865	2.8349	2.4975	
85%	2.5837	2.4844	1.7069	2.7123	2.1228	2.4012	2.0684	2.3575	2.0818	

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

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

Page No. 47

For ample clarity, the following paragraph –

‘The Depreciated Exchange Rate would be the average of SBI's TT Buying Rate for the period 2 working days before and 2 working days after the New Indexation Date (both days inclusive). The New

Indexation Date would be the earlier of the date of Financial Closure and the date falling 12 months after the Milestone Date or the actual date of signing the last of the agreements among those listed above if such date is later than the Milestone Date.’

May be read as –

‘The Depreciated Exchange Rate would be the average of SBI’s TT Buying Rate for the period 2 working days before and 2 working days after the New Indexation Date (both days inclusive). The New Indexation Date would be the earlier of –

- (a) the date of Financial Closure, and
- (b) the date falling 12 months after the Milestone Date or the actual date of signing the last of the agreements among those listed above if such date is later than the Milestone Date.’

Page Nos. 48 & 54

Option 1: Bulleted Point 3

Capacity charges of US\$ 0.0362 per KWh in the years 1 to 12, 50% of which would be converted into Rupees at the current exchange rate (\$ component) and 50% would be converted @ Rs. 35 (Re. Component). The ratio would become 25% and 75% respectively for the years 13 to 30 while the capacity charges would be US\$ 0.0101 in years 13 to 30 after COD. The levelised tariff (fixed charges) assuming a current exchange rate of Rs. 42.5, works out to Rs. 1.2376 per KWh at 85% PLF (as against Rs. 1.2249 per KWh assuming O&M charges converted at Rs. 35).

Page Nos. 49 & 54**Option 2: Bulleted Point 3**

Capacity charges of US\$ 0.0432 per KWh in the years 1 to 12, 50% of which would be converted into Rupees at the current exchange rate (\$ component) and 50% would be converted @ Rs. 35 (Re. Component). The ratio would become 25% and 75% respectively for the years 13 to 30 while the capacity charges would be US\$ 0.0121 in years 13 to 30 after COD. The levelised tariff (fixed charges) assuming a current exchange rate of Rs. 42.5, works out to Rs. 1.2436 per KWh at 85% PLF (as against Rs. 1.2309 per KWh assuming O&M charges converted at Rs. 35).

Option 2: Bulleted Point 5

Incentive @ 20% of fixed charges to be paid for PLF (including deemed generation) beyond 68.5% upto 85%. Incentives will be calculated by converting fixed charges at the rate of 1 US\$ = Rs. 35 and will not be eligible for indexation.

Page No. 51**Point VII.7**

For further clarification, the following should be read after the 2nd paragraph -

In any case, the parties have been discussing the tax assumptions, which are presented in Exhibit 1.

Annexure IV:

Revised sheets as a result of the discussions and deliberations are enclosed.

ADDENDA

(The page / paragraph numbers refer to those in the Consultants' Report of 21st August 2000)

The tariff comparisons have been done at constant and current prices, the assumptions being as under -

Constant Prices

Nil inflation and no rupee depreciation vis-à-vis US\$.

Current Prices

Inflation at 7.5% CPI and 6% WPI, Rupee depreciation of 5.39% p.a. vis-à-vis US\$.

The above assumptions have been discussed with and agreed to by all parties.

VI.2 Fixed Charge Component of Tariff

Estimation of fixed charge component of tariff

The total project cost has been estimated to be Rs. 20,477 crore at an exchange rate of Rs. 42.5 per US\$ (without taking into account any customs/excise/sales taxes). This cost works out to Rs. 4.74 crore per MW.

Since the EPC cost for the project has been estimated by the Technical Consultant based on budgetary offers received from equipment manufacturers and in-house data, the final price after actual negotiations may be lower than that estimated now by a margin of 5% to 10%. Sensitivities have been carried out for an EPC cost at 95%

and 90% of that estimated by the Technical Consultants respectively. On taking the EPC cost at 95% of that estimated by the Technical Consultant, the project cost works out to Rs. 19,469 crore (Rs. 4.51 crore per MW) and by taking the EPC cost at 90%, the project cost works out to Rs. 18,460 (Rs. 4.27 crore per MW). The tariffs at various PLFs and under constant and current prices at the above sensitivities as presented in Annexure IV.

A comparative analysis of the project cost in Rs. crore per MW (without the above taxes and duties) for the other projects under comparison is given below -

Sr. No.	Project	Project Cost (Rs. Crore / MW)
1.	Korba	4.54
2.	Vizag	4.70
3.	Simhadri	3.83
4.	Cuddalore	4.33
5.	Videocon	4.22
6.	Mangalore	4.50

It may, however, be kept in view that Hirma’s project cost includes costs of an FGD and MGR amounting to US\$ 227 mn. as estimated by the Technical Consultants and which are not reflected in the capital costs of other projects (except Mangalore). If these costs are excluded, the cost per MW of Hirma as estimated by the Consultants works out as under -

Sensitivity	Project Cost (Rs. Crore per MW)
Base Case	4.47
EPC Cost @ -5%	4.25
EPC Cost @ -10%	4.03

Comparison with other Projects

To ensure a meaningful and informed comparison, it is essential to keep in view the current status of the projects under comparison with regard to the progress made in terms of signing of important agreements like PPA, achieving financial closure and likely date of commissioning.

- **Mangalore Power Project**

This project was being developed by Cogentrix and was one of the fast track counter guaranteed power projects. However, the project experienced inordinate delays due to various reasons including public interest litigation against the project and Cogentrix ultimately walked out of the project. As per the latest reports, although China Light and Power have taken over the project, there are no reports on any progress being made by the project.

- **Vishakhapatnam Power Project**

This project is being developed by Hindujas and National Power, UK. The PPA has been signed but, as per the latest reports, APTransco have asked the promoters to bring down the project cost and negotiations are currently going on in this regard. Further, there are outstanding issues regarding the coal transportation arrangement

and availability of escrow cover. The project is unlikely to make progress unless these issues are resolved.

- **Bhadravati Power Project**

This project is being developed by the Ispat Group and the PPA has been signed. As per the latest reports, however, due to various reasons, there has not been much progress on the project and it is unlikely to achieve financial closure in the near future.

- **Korba East Power Project**

This project was being developed by Daewoo, Korea and ABB. However, it faced considerable delays primarily on account of the escrow issue in Madhya Pradesh. As per latest reports it appears that both promoters are not pursuing the project.

- **North Madras Power Project**

This project is being developed by the Videocon Group and National Power, UK. The project is in an advanced stage of achieving financial closure pending settlement of final project cost and agreement on the shared facilities.

- **Simhadri Power Project**

This project is being developed by NTPC and is in an advanced stage of implementation. The orders for the main plant and equipment were reportedly placed early last year and construction activity is in full swing at the site.

- **Cuddalore Power Project**

The TEC for the project was granted in August 1999. However, no other information is available regarding the status of the project.

Of the above projects taken for comparison, therefore, only two projects, viz. Simhadri (which has started construction) and Videocon (which is nearing financial closure) have really taken off while the others either are still in various stages of negotiations or have been abandoned by the initial promoters.

The most relevant and meaningful analysis for the purpose of assessing the reasonableness and competitiveness of SEAP's tariff offer would, therefore, be with these two projects. Nonetheless, a detailed comparative tariff analysis has been carried out considering all the above projects.

Comparative Analysis

The comparison of levelised tariff (fixed charges) of Hirma with other projects has been carried out by the following methods -

Method 1: Comparison of the levelised tariff at constant and current prices of SEAP's tariff offer with the estimated tariff of other projects with suitable correction for size, number of units, MGR, FGD and Mega Power Project benefits.

Method 2: Comparison of the levelised tariff at constant and current prices of SEAP's tariff offer with the estimated actual tariff of other projects, with and without Mega Power Project benefits.

For all comparison, it would be necessary to adjust SEAP's offer to arrive at the same front loading level as of the normal two part tariffs since the reduction in levelised tariff due to higher levels of front

loading is essentially on account of the tax holiday available to such a project.

A normal two part tariff has a front loading level of 74% at current prices and 84% at constant prices. However, due to SEAP's tariff offer having a different profile than a two part tariff, SEAP's tariff offer does not result in the same tariff translating into a front loading of 74% at current prices and 84% at constant prices. The comparative analysis has, therefore, been carried out taking SEAP's offer at front loading levels of both 84% at constant prices and 74% at current prices.

With regard to payment terms like discounts for prompt payment etc., the same have not been considered for tariff comparison as we are of the view that they are not tariff issues but commercial issues regarding payment terms to be settled separately. Further, any such discounts, in accounting terms, would essentially be in the nature of cash discounts that are not treated as part of tariff income and accounted for separately.

The following tables give the tariffs as per Methods 1 & 2 for the projects under comparison as well as SEAP's offer of October, 1999 under constant and current prices at 85% PLF -

Method 1

Rs/KWh

LEVELISED TARIFF COMPARISONS AT CONSTANT PRICES										
Project PLF ##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	1.7454	1.7988	1.9114	1.4333	1.4170	1.6123	1.6842	1.4633	1.6442	1.5615
75%	1.5954	1.6441	1.7469	1.3103	1.2954	1.4738	1.5394	1.3652	1.5343	1.4570
80%	1.4966	1.5423	1.6387	1.2294	1.2154	1.3826	1.4442	1.3008	1.4619	1.3883
85%	1.4095	1.4525	1.5432	1.1580	1.1448	1.3022	1.3601	1.2438	1.3981	1.3276

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Rs/KWh

LEVELISED TARIFF COMPARISONS AT CURRENT PRICES										
Project PLF##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	2.8267	2.9652	3.0769	2.1830	2.2425	2.5350	2.7400	2.4865	2.8349	2.4975
75%	2.5848	2.7113	2.8133	1.9970	2.0513	2.3184	2.5056	2.2997	2.6216	2.3118
80%	2.4256	2.5442	2.6399	1.8746	1.9255	2.1759	2.3514	2.1768	2.4813	2.1896
85%	2.2852	2.3968	2.4869	1.7666	1.8145	2.0502	2.2154	2.0684	2.3575	2.0818

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Method 2

Rs/KWh

ACTUAL TARIFF AT CONSTANT PRICES										
Project PLF##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	2.0075	1.8648	1.9966	1.6624	2.0637	1.8297	1.8619	1.4633	1.6442	1.5615
85%	1.6204	1.5058	1.6119	1.3423	1.6668	1.4779	1.5029	1.2438	1.3981	1.3276

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Rs/KWh

TARIFF WITH MEGA PROJECT BENEFITS AT CONSTANT PRICES										
Project PLF##	Korba	Vizag	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@	
68.49%	1.8440	1.7097	1.5436	1.9328	1.6672	1.6689	1.4633	1.6442	1.5615	
85%	1.4886	1.3808	1.2465	1.5612	1.3470	1.3474	1.2438	1.3981	1.3276	

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

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

Rs/KWh

ACTUAL TARIFF AT CURRENT PRICES										
Project PLF##	Korba	Vizag	Bhadravati	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@
68.49%	3.4511	3.3202	3.2870	2.2533	3.5546	2.8685	3.2776	2.4865	2.8349	2.4975
85%	2.7855	2.6807	2.6539	1.8204	2.8738	2.3203	2.6455	2.0684	2.3575	2.0818

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

Rs/KWh

TARIFF WITH MEGA PROJECT BENEFITS AT CURRENT PRICES										
Project PLF##	Korba	Vizag	Simhadri	Mangalore	Videocon	Cuddalore	SEAP's Offer*	SEAP's Offer#	SEAP's Offer@	
68.49%	3.2007	3.0765	2.1126	3.3541	2.6233	2.9745	2.4865	2.8349	2.4975	
85%	2.5837	2.4844	1.7069	2.7123	2.1228	2.4012	2.0684	2.3575	2.0818	

Including deemed generation

*SEAP's offer dated 27th October 1999 with guaranteed availability of 68.49%# SEAP's offer dated 27th October 1999 with 74% Front Loading at Current Prices@ SEAP's offer dated 27th October 1999 with 84% Front Loading at Constant Prices

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

Since any purchaser of power would be concerned more about the actual tariff charged, the true comparison for determining the competitiveness of a project would be with the actual tariffs rather than with tariff figures as derived under Method 1, as the same are only notional.

Further, as has been stated by the Technical Consultant, adjustments for economies of scale are based on statistical curves and may lead to some distortions, which are more pronounced while comparing projects at two extremes of the spectrum, as is apparent in the case of Mangalore, where even though the actual tariff is the highest among all projects under comparison, the tariff after applying the economies of scale factor is among the lowest. Further, there are many project specific aspects that may not be adequately captured by applying the factors for economies of scale adjustment.

Again, as any purchaser of power would be concerned more about the actual tariffs, it would be more appropriate to compare tariffs in current price terms.

Keeping the above in view, a comparative analysis of SEAP's offer (at a front loading level of 74% at current prices and Mega Power Policy Benefits) with the Simhadri and Videocon projects, at current prices and at 85% PLF is summarized below -

Rs./KWh

TARIFF OF SIMHADRI WITH MEGA PROJECT BENEFITS AND CORRECTION AS IPP AT CURRENT PRICES	
EPC Increase (Refer Note 2)	SIMHADRI TARIFF
7.5%	2.1509
10%	2.1874
12.5%	2.2240
15%	2.2605

The tariff of the Videocon Project works out to Rs. 2.1228 /KWh at 85% PLF.

As against the above, SEAP's Offer of Oct. '99 is Rs. 2.3575 at 85% PLF, 74% front loading and current prices.

The following would, however, have to be kept in view while comparing the above tariffs -

- Videocon enjoys a number of facilities like Shore Unloaders, Coal unloading berth at Ennore Port, conveyor belt, water supply channel, ash disposal facilities etc. which are shared with the adjacent North Madras Power Plant of TNEB for which an amount of only Rs. 10 crore has been provided in the project cost in the TEC given by CEA. However, as the actual cost of these facilities is expected to be much higher, for meaningful comparison of the tariff of this project, suitable loading would have to be done in the project cost, which would lead to a higher tariff. The impact of the cost of the shared facilities on the tariff has not been factored due to lack of firm information regarding these costs.

The Simhadri project, as already explained in the Consultants' Report dated 21st August 2000, is a project being set up by NTPC and enjoys a number of cost advantages over a normal IPP project due to the package approach to contracting, in house engineering, less stringent LD provisions, balance sheet funding, longer implementation time frames etc. A comparative analysis has thus been done with the Simhadri project, after making the following adjustments to the project parameters -

- Foreign to Domestic Equity Ratio: 50:50
- Implementation Time: 36 and 39 months for Units 1 & 2 respectively

- Financing Costs: As per assumptions for other IPP projects given in Annexure 2 to the Consultants' Report
- EPC Cost: 10% increase in the Works Cost as per TEC. However, it may be pertinent to note that this figure is only an indicative figure and the actual EPC cost would be dependent on the risk factors and performance assurances that are stipulated in the EPC contracts. EPC costs are specific to each project and where performance guarantees are of a high order and project risks, especially completion risk, invite stiff penalties, it has been observed that EPC costs tend to be higher.
- Further, as per analysis based on the TEC's of the projects under comparison, the EPC costs per MW of the IPP projects are approximately 15% - 20% higher than the works cost per MW for the Simhadri project. Thus, a sensitivity has been done for Works cost increase in a range of 7.5% to 15%.
- Adjustments for costs of FGD based on CEA cleared costs for Mangalore (similar sized project) and MGR based on cost estimates of the Technical Consultant for the Hirma Project and adjustment for locos and wagons.

As such, considering the differences in NTPC (Public Utility) projects and projects set up by IPPs (Private Sector), in our opinion, an NTPC project is not an ideal yardstick for comparisons.

It is also pertinent to note that given NTPC's Balance Sheet size of around Rs. 30,000 crore and its debt service obligations, it does not appear probable that NTPC would be in a position to undertake execution of projects of such size and magnitude.

VII.4 Adjustment factor for SEAP's Offer if Financial Closure not achieved by 31st December 2000

The milestone dates have been suggested as 30th June 2001 and 31st March 2001 for Options 1 and 2 respectively to compensate for the fact that the degree of protection against Rupee depreciation in Option 2 would be lower since the incentive amount in this option is converted at Rs. 35 only.

FINAL RECOMMENDATIONS

Pursuant to the submission of the Consultants' Report of 21st August, 2000, hearings were held by the CERC on 29th, 30th and 31st August 2000 where all the tariff related issues were discussed at great length with all parties concerned. A summary of the discussions held at these hearings as well as SBICAP's final recommendations are given below -

- **Super Critical vs Sub Critical Boilers**

Both parties have agreed to the use of Super Critical Boilers since SBICAP's analysis shows that the overall levelised tariff (fixed charges plus coal charges) would reduce at PLF of over 80%. Further, the payback period at 85% works out to 4 years while the NPV of the cash flows is around Rs. 31 crore. Our recommendations regarding increase in fixed charges and implementation schedule have already been provided in the Consultants' Report dated 21st August 2000.

- **O&M Indexation**

Both parties have agreed to adopt Option 2 offered by SEAP viz. conversion of the O&M charges into Rupees at the commissioning of Unit 1 at the then prevailing exchange rate, however, subject to a ceiling of 2% of the completed capital cost of the project and subject to subsequent indexation as per the GoI norms. The indexation rate for the O&M indexation may be taken as a weighted average of the CPI and WPI with the weights being 30% and 70% respectively.

- **Front Loading of Tariff**

Most of the SEBs, except Rajasthan SEB, initially expressed that they would be agreeable for a front loading of 74% only. However, a detailed discussion regarding the merits of 88% front loading was held and the following points emerged :

- The levelised tariff is the lowest at 88% front loading.
- The increase in tariff in the years 13-30 by reducing the front loading to 74% is much higher than the increase in the years 1-12.
- SEAP confirmed that the tax benefits due to front loading of the tariff from 74% to 88% are reflected in the levelised tariff offers under comparison and that the levelised tariffs at 74% and 88% correspond to each other in this respect.
- In the Consultants' Report dated 21st August, 2000, it was mentioned that the differential IRR for the years 1-12 and years 1-30 is low at 88% front loading levels. SEBs expressed a view that this may result in inadequate incentive for the developer to continue operations after 12 years. After detailed discussions, however, it emerged that since the PPA would be signed for a 30 year period, suitable contractual obligations would bind both parties for the entire 30 years and which would be enforceable.

Keeping the above in view, we would recommend that the SEBs may choose the tariff profile at 88% front loading. However, since the SEBs have sought time to again confirm the level of front loading that

would be acceptable, we have presented the final tariff recommendations at front loading levels of 88% as well as 74%.

- Availability vs PLF

It was agreed that the tariff would be finalized considering guaranteed availability and PLF (including deemed generation) levels of 85% since it would lead to the most optimum utilisation of the plant capacity . Further, it was agreed that the final tariff would be in line with the risk profile of Option 1 suggested by SBICAP in the Consultants' Report dated 21st August, 2000, viz. recovery of full fixed charges at 85% PLF including deemed generation since this would provide sufficient deterrent for ensuring that the plant's availability does not fall below 85%.

- Adjustment Factor to be applied to the rate of Rs. 35 per US\$ used for arriving at the Rupee component of capacity charges

Although SEAP was agreeable to the methodology proposed by SBICAP for adjusting the above exchange rate in case of delay in signing of the 4 important agreements, viz. PPA, FSA, Implementation Agreement and Security Package and subsequent achievement of financial closure, PTC was not in favour of the same. However, keeping in view the fact that this exchange rate of Rs 35 per US\$ was prevalent in 1996 at the time of SEAP's initial offer and the current rate is around Rs. 46, SBICAP is of the view that some linkage to a timeline is required to compensate for the inflation and depreciation during this period. The methodology recommended by SBICAP as outlined in the Consultants' Report dated 21st August, 2000 may, therefore, be followed for adjustment of the exchange rate of Rs. 35 per US\$ with the milestone date being set at 30th June, 2001.

▪ **Levelised Tariff**

Although SEAP was agreeable to the two Options suggested by SBICAP for the tariff as given in the Consultants' Report dated 21st August, 2000, PTC and SEBs expressed the view that the tariff should be lower. The issue was discussed in great detail in the background of the analysis presented above in the section 'ADDENDA'. Keeping in the view the positions of all parties and the results of the comparative analysis carried out, the following tariff is recommended for the Hirma Project for Sub Critical Boiler Units :

Tariff Component (In US Currency)	Years 1-12 (After COD)	Years 13-30 (After COD)
Capacity Charges	3.564 cents per KWh	1.034 cents per KWh
O&M Charges	0.169 cents per KWh	0.169 cents per KWh
Total Fixed Charges	3.733 cents per KWh	1.203 cents per KWh
% Capacity Charges denominated in US\$	46%	23%
% Capacity Charges denominated in Rs.	54%	77%

- The US\$ denominated capacity charges will be converted into Rupees at the prevailing exchange rate.
- The Rupee denominated capacity charges will be converted into Rupees at the fixed exchange rate of Rs. 35 per US\$, subject to adjustment as per the Adjustment Factor to be calculated as per the recommendations in this regard given above.
- The O&M charges will be converted into Rupees and indexed as per the recommendations given above.
- The PLF (including deemed generation) and availability will be guaranteed at 85%.

- The full fixed charges will be recovered at 85% PLF including deemed generation.

The above levelised tariff works out to Rs. 1.2134 per KWh at constant prices and Rs. 1.9704 at 85% PLF, at current prices, at an exchange rate of Rs. 42.5 per US\$ and front loading of 87.7% at current prices. We have estimated the corresponding tariffs at front loading levels of 74% based on the earlier offers of SEAP at the two front loading levels and these approximately work out to Rs. 1.3646 per KWh and Rs. 2.2628 per KWh at constant and current prices respectively. However, these figures would need to be confirmed by SEAP.

A comparative analysis of the above recommended tariffs is given in the Annexure titled 'Tariff Recommendation Analysis Sheet'.

The above tariff recommendations have been adjusted for Super Critical Boiler Units as per the recommendations given above, i.e. increase in fixed charges of 0.74% including an increase in O&M charges of 2.5% and are given below -

Tariff Component (In US Currency)	Years 1-12 (After COD)	Years 13-30 (After COD)
Capacity Charges	3.587 cents per KWh	1.039 cents per KWh
O&M Charges	0.173 cents per KWh	0.173 cents per KWh
Total Fixed Charges	3.761 cents per KWh	1.212 cents per KWh
% Capacity Charges denominated in US\$	46%	23%
% Capacity Charges denominated in Rs.	54%	77%

The above levelised tariff works out to Rs. 1.2223 per KWh at constant prices and Rs. 1.9860 at 85% PLF, at current prices, at an exchange rate of Rs. 42.5 per US\$ and front loading of 87.6% at current prices.

The detailed tariff profiles of the above tariff recommendations at constant and current prices are given in the Annexures.

With regard to the other initial areas of disagreement viz. Station Heat Rate, Means of Financing, Change in Law, Secondary Fuel Consumption and Cost of Coal, all parties were agreeable to SBICAP's recommendations as given in the Consultants' Report dated 21st August, 2000.

Further, as per our recommendation outlined in the Consultants' Report, the incentive for despatch above 85% PLF would be calculated as 1 paise per KWh for 1% increase in despatch above 85% PLF, 2 paise per KWh for a 2% increase in despatch above 85% PLF and so on.

Qualifiers Underlying the Tariff Recommendation

The tariff (fixed charges) being recommended depends on certain assumptions and may change depending on changes in any of the following parameters:

1. Inflation (WPI & CPI) rates

For our analysis the inflation rates have been assumed as 7.5% p.a. (CPI) and 6% p.a. (WPI) that have been derived from data compiled by Reserve Bank of India.

2. Depreciation of the Rupee vis-à-vis the US\$

For our analysis, the Rupee depreciation rate of 5.39% has been derived based on the expected differentials in domestic and US inflation rates. The US inflation rate has been assumed as 2% p.a. based on data compiled by Black & Veatch.

3. Tax assumptions as mentioned in SEAP's offer.

4. Adjustment factor which may have to applied to the exchange rate of Rs 35 taken for arriving at the Rupee component of fixed charges due to delay in signing of the four agreements listed in the report, and subsequent achievement of financial closure.

List of Annexures

- Tariff Recommendation – Analysis Sheet
- Levelised Tariff Comparisons at Constant Prices
- Levelised Tariff Comparisons at Current Prices
- Hirma Project Levelised Tariffs at Constant Prices
- Hirma Project Levelised Tariffs at Current Prices
- Final Tariff Proposal at Constant Prices (Sub Critical Boiler)
- Final Tariff Proposal at Current Prices (Sub Critical Boiler)
- Final Tariff Proposal at Constant Prices (Super Critical Boiler)
- Final Tariff Proposal at Current Prices (Super Critical Boiler)