

Central Electricity Regulatory Commission

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Hirma Mega Power Project

Petition No 24/2000

This note is intended to brief the press about the order issued by the Commission on September 5, 2000 setting the tariff of the generation component of the Hirma Mega Power Project.

Contents

Background

The proposal of the developer M/s SEAP

The Process adopted by the Commission

Report of the Consultants

Order of the Commission

Background

The Hirma Project is being developed by a company titled Southern Energy Asia Pacific (SEAP), which is a subsidiary of the Southern Company of the USA. It also envisages some equity sharing by Reliance Industries of India. It is a composite scheme comprising of generation in Orissa, using locally available coal, from identified captive mines, and its transmission to five states spanning two different regions. The project will supply power to Punjab, Haryana and Rajasthan in the Northern Region and Madhya Pradesh and Gujarat in the Western Region. The generation component consists of a mine mouth coal fired plant of 3960 MW (6*660) which will use super critical boiler technology for the first time in India. It will be the largest generation plant of its type and configuration in the World.

The power generated by the project will be sold by the generator at the bus bar to Power Trading Corporation which, in turn, will sell the power to the five consuming states through back to back agreements. The project had been under consideration of the Government since 1996. The government has granted this project Mega Power status under its Mega Power Policy 1995. The Government had also constituted the Standing Independent Group (SIG) in November 1997 as the apex body to oversee the implementation of the Mega Private Power Projects. The SIG subsequently ceased to function. The power to determine the tariffs of projects with a composite scheme for the generation and sale of electricity in more than one state was transferred to the CERC in May 1999.

The petition to determine the tariff of the Hirma Project was filed by the Power Trading Corporation before the Commission on March 31, 2000. The petition was admitted under section 13 (h) of the ERC Act 1998. The petition is limited to the generation component of the scheme. The trading margin to be charged by PTC if any and the scheme for transmission of the power have not been included and are expected to be submitted subsequently. All parties have however submitted that the tariff decided by the Commission will be binding on them.

The proposal of the developer; M/s SEAP Ltd.

The proposal of the project developer regarding the tariff to be charged given on October 1999 was as under:

1. Fixed charge to be recovered at 68.5% PLF on a take or pay basis.
2. The fixed charge varies during the first 12 years and the remaining 13 to 30 years.

3. The fixed charge per kWh during the first 12 years was US cents 2.159 at the prevailing exchange rate plus Rs 0.759. During the subsequent 13 to 30 years the charge is US cents 0.302 at the prevailing exchange rate plus Rs 0.317.
4. The dollar component will be converted to Rs using current rates.
5. The O&M charges per kWh are Rs 0.074 per kWh through the life of the plant.
6. An incentive at the rate of @25% of the fixed charge payable in Rs at the conversion rate of Rs 35 to a US\$ will be paid for generation above 68.5% PLF. On such generation there will be no O&M charge.
7. The fixed charge is inclusive of return, all taxes and duties.

The process adopted by the Commission

This was a contested petition. There were significant areas of disagreement between Ms SEAP, the developers of the generation component on the one hand and PTC and the SEBs of the beneficiary states on the other. In order to narrow the area of disagreement and develop a spirit of compromise and consensual functioning so necessary for the completion of a complex project of this type, the Commission felt it appropriate to appoint a consultant with the attached Terms of Reference. SBI Caps was chosen as the consultant mutually acceptable to all parties.

Report of the Consultants; M/s SBI capital Markets Ltd.

The report of the consultant was received on August 21, 2000 and circulated to all parties. A public notice was also issued inviting comments on the report. The report notes that the following areas of previous disagreement were resolved during the process of consultation with the parties.

1. All parties agreed to the use of super critical boiler technology since it is a "no regrets option". The incremental cost is 0.74% of the capital cost which is more than fully neutralised by lower variable cost on account of the lower net heat rate which will decrease from 2460 Kcal/kWh to 2411 Kcal/kWh. The NPV at 85% PLF is Rs 31 crore.
2. All parties have agreed to the target availability norm of 85% at which the full fixed cost is to be recovered with a prorata reduction in the recovery of fixed cost for lower levels of availability. This is in conformity with the ABT norm for thermal plants specified by the Commission.
3. All parties have agreed to the secondary fuel consumption norms as suggested by the technical consultants.
4. The cost of coal will be calculated at the loading point of the MGR.

The areas of disagreement, which remained for resolution at the time of submission of the first report of the consultants were the following:

1. The currency denomination of the fixed charge.
2. The rate at which the O&M charge is to be converted into Rs and subsequently indexed.
3. The exchange rates at which the foreign currency component of the fixed charge would be recovered.
4. The extent to which fixed charges are to be recovered, in present value terms, during the first 12 years of commercial operation. This is also termed as the degree of front loading of the fixed charges.
5. The level of fixed charges comprising capacity charges and O&M.

Subsequent to hearing the comments of the various parties the consultants recommended the following on these issues:

1. The consultant has recommended a ratio of 46% for the US\$ denominated part of the fixed charge and 54% for the Rs denominated part during the first 12 years and 23% for US\$ and 77% for Rs denominated part during remaining 13 to 30 years.
2. The O&M charge of US cents 0.0017 per kWh to be converted into Rs at the exchange rate prevailing on Commercial operation of unit 1 subject to a ceiling of 2% of the completed capital cost of the project and then to be indexed as per GOI guidelines.
3. The conversion rate of Rs 35 to a US\$ would apply for converting the US\$ denominated portion so long as all four agreements (Power Purchase Agreement, Fuel Supply Agreement, Implementation Agreement (state support) and Security Package) are signed by the "mile stone date" June 30, 2001. In case these are not concluded within the milestone date, the proportionate benefit of any depreciation in the Rs after the "mile stone date" and till the earlier of either the financial closure or the signing of the last of the four agreements or twelve months from the mile stone date will accrue to the developer.
4. 88% of the fixed charge should be recovered in the first twelve years since this optimises the levelised tariff level after accounting for the tax advantages of front loading.
5. For recommending the level of fixed charges to be paid to the developer the consultants have relied upon a "like to like" comparison of the Hirma project with other coal fired generation projects. They have chosen six projects for the purpose. Of these projects NTPC Simadhari is the only project under construction. The rest are at various stages of conclusion of the initial agreements prior to implementation. However all the selected projects have received the TEC from the CEA. A series of

adjustments have been made to the agreed fixed charges of these projects to enable a "like to like" comparison with Hirma.

- None of these projects enjoys the waiver of customs duty available for Mega Power Projects. Hence the element of customs duty has been deducted from the agreed fixed charges of these projects.
- Under the IPP tariff norms of the GOI the natural level of recovery of fixed cost comes to 74% in the first 12 years accordingly to make the Hirma fixed charge comparable with the fixed charge of the IPPs it has been adjusted to reflect a recovery of only 74% during the first 12 years after COD.
- Of the selected comparable projects Simhadri is the only public sector project. Public sector projects execute a considerable part of their projects in house. They do not follow the turnkey route of project execution. They appoint different contractors for different modules and coordinate the project themselves. Accordingly they save on project engineering and construction costs, as compared to IPPs, which are forced to follow the turnkey route so as to reduce the risk on the developer and the financier of the project. Conversely public sector projects transfer the costs of project overruns to consumers unlike IPPs which limit such risk contractually. It is difficult to estimate the net impact of these differences between the public sector projects and IPPs. Hence the consultants have adjusted the fixed charges of Simhadri at various notional levels of unincurred cost purely for comparison purposes.
- To facilitate the comparison, the cost streams on account of fixed charges of all the projects have been levelised at a discount rate of 12%.
- It is not enough to compare the fixed charges in terms of constant prices. Fixed charges are to be paid by consumers over the life of the project. Their nominal levels will be impacted by variations in the exchange rate of Rs versus US\$ and the domestic inflation rate. The interse share of US\$ and Rs in the denomination of fixed charges varies across IPPs, NTPC and Hirma as does the level of O&M charges. To normalise for such variations, the consultants have adopted an assumed domestic inflation rate comprising WPI of 6% and CPI of 7.5% with an interse weightage of 70:30 between the two and a derived rate of depreciation of the Rs of 5.39% per annum linked to the differential in the assumed domestic inflation rate and the assumed inflation rate in US\$ of 2%.

The comparative chart is available at Annexure 1.

The consultants have recommended a levelised fixed charge rate of Rs 1.2134 at 88% front loading, which corresponds to Rs 1.3646 at 74% front loading. Capital costs on account of use of the super critical technology are additional at 0.74% of the capital costs.

Order of the Commission (September 5, 2000)

The Commission considered the views of the consultants and the various parties and in accordance with its precept that the project must proceed, to the extent possible, on a consensual basis the Commission has accepted all those recommendations to which all the parties have agreed. These are listed below:

1. Guaranteed offtake at 85% PLF and recovery of full fixed charge at 85% of availability with prorata reduction in the recovery of fixed charge below that level of availability.
2. An incentive will be payable for despatch above 85% PLF. The rate of incentive will be determined at the rate of 1 paise per 1% increase in PLF, with the marginal rate thus determined, applied to the entire energy despatched beyond 85% PLF.
3. An O&M charge of US cents 0.169 to be converted into Rs at the exchange prevailing on date of COD of the first unit and indexed thereafter under the GOI formula.
4. A capacity charge, 46% of which will be denominated in US\$ for the first twelve years and 23% in US\$ for the remaining eighteen years. For the purpose of calculating the US\$ denominated component from the capacity charge approved by the Commission in Rs an exchange rate of Rs 35 to the US\$ to be used.

The Commission was required to determine the fixed charge comprising the capacity charge and the O&M charge.

Ideally the Commission would have liked to use the avoided cost approach. The objective of the MPP is to reduce the delivered cost of power for consumers. This can only be gauged if the marginal cost of delivered power for the five states is known. Unfortunately this data was never presented to the Commission. The delivered cost of Hirma will depend on the trading margin charged by PTC and the transmission charges levied by POWERGRID, both of which have not been disclosed. Due to these limitations the avoided cost approach could not be adopted as a benchmark and used for determination of the fixed charges.

The second option for tariff determination is the intrusive approach of the "cost to serve" methodology. Adoption of this approach has been negated by the nature of the offer which is an inclusive tariff based one. The detailed costs of the developer were not known to the Commission. To attempt to discover such costs would change the very substance and nature of the tariff proposal.

The only alternative before the Commission was therefore to adopt the yardstick comparison approach. This is what the consultants have done by selecting comparable projects and comparing the fixed charges of Hirma with the fixed charges of such projects. The Commission therefore accepted the approach of the consultants. However it has been unable to accept the level of Rs 1.3656 recommended by the consultants for the fixed charge at a front loading of 74%.

The Commission has noted that with a front loading of 74% on a like to like basis with Mega Power Projects the lowest fixed charge per kWh in constant terms is Simadhari at Rs 1.2465. The next highest is Videocon at Rs 1.347 followed by Cuddalore at Rs 1.3474, and Vishakhapatnam at Rs 1.3808.

Simadhari is unique in that it is the only public sector project in the comparison. The Commission has accepted that the structure of risk sharing varies in public sector and IPP type projects. Customers take a higher risk in public sector projects in terms of the project completion costs and hence are rewarded with a lower price. In addition it is also possible that the extent of in house project implementation effort done by public sector units lowers the cost of such projects in comparison to IPPs. Accordingly benchmarking Hirma to Simadhari may not be a fair comparison.

However Videocon, Cuddalore and Vishakhapatnam do not suffer from this asymmetry in risk sharing. These are all IPP projects and it can safely be assumed that the risk sharing profile of all these will be similar to Hirma.

The consultants have also cautioned that in the case of Videocon the cost of shared facilities have not been appropriately reflected in the project agreements and hence the revealed fixed charge is an under estimate. The Commission has noted this advise but it is significant that the fixed charge of these three projects are closely clustered between a range of Rs 1.3470 to 1.3808. Neither Cuddalore nor Vishakhapatnam suffers from the infirmity of inadequate reflection of costs. Hence the Commission has focussed on the range of fixed charges provided by these IPP projects as the appropriate benchmark with which to compare the Hirma fixed charge.

However, there is one important point of difference between Hirma and these projects. This relates to the economies of scale. One of the stated objectives of the Mega Power Policy is to ensure benefits from the economies of scale. The report of the technical consultant highlights that the scale economy from using 660 MW units as opposed to 500 MW units is around 5% of the cost. In addition a scale economy of 6% accrues because of the size of the project which has six 660 MW units. The combined scale economy in the case of Hirma should be around 10.7% over the fixed charge of a single 500 MW unit project.

While the projects selected by the Commission for comparison all use 500 MW units they are not single unit plants and use multiple 500 units. Accordingly a part of the scale effect of using multiple units is already included in their revealed prices. Secondly the capacity charge of Hirma is inflated due to the environmental requirement to install a Flue Gas Desulfuriser (FGD). Other projects are not similarly loaded with this environmental cost. Thirdly the developers of Hirma have committed to invest in the infrastructure of Orissa at the rate of US\$ 5 million per annum per unit over the entire 30 year life of the project. Once all the units are operational this will amount to US\$ 30 million per annum. The benefit equates to around Rs 0.04 per kWh of generation. Due to these project specific cost differences it becomes difficult and complex to precisely determine the likely beneficial impact of economy of scale. The Commission is also aware that it must safeguard the financial viability of the project while protecting the rights of the consumer and preserving the objectives of the Mega Power Policy. Accordingly any price below the lowest revealed IPP price is indicative of the impact of economy of scale and also reflective of the additional benefit to the consumer from the MPP policy.

The Commission has thus determined Rs 1.33 in constant terms at a front loading of 74% as the appropriate fixed charge for the Hirma project. This is 3.7% lower than the fixed charges of Vishakhapatnam, the most expensive comparable IPP project in the range of consideration and 2.5% lower than the average of the three comparable IPP projects in the range of consideration. It is expected that the scale effect will be even larger in current terms.

The original offer of the developer in constant terms was Rs 1.3981 at a front loading of 74%. The allowed fixed charge of Rs 1.33 represents a reduction of 5.1% over this level. The allowed fixed charge will also be lower than the actual fixed charges of Simadhari (without accounting for MPP benefits) as faced by consumers of Rs 1.3423 at constant prices. The consuming SEBs and PTC are free to choose the level of front loading. The allowed fixed charge is inclusive of all taxes and duties but will need to be adjusted to account for a front loading of 88% and for super critical boiler technology. The latter adjustment is expected to add around Rs 0.02 to the fixed charge though it will also reduce the variable charge. This calculation is to be done by the consultant along with the parties and will be confirmed by the Commission.

The allowed fixed charge is competitive and efficient. It implements the objectives of the MPP policy by reducing the cost of generation. It is judged to simultaneously provide a reasonable return for the investor, as revealed through yardstick comparison with other IPP projects. The allowed fixed charge is dependent on the timely completion of agreement formalities and hence it will incentivise all concerned to proceed with project

implementation expeditiously so as to achieve the national objective of power for all at reasonable rates.
