ORISSA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
UNIT-VIII, BHUBANESWAR - 751 012
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Present : Shri B.K. Das, Chairperson
Shri K.C. Badu, Member
Shri B.K. Misra, Member

Case No.125/2009

M/s. Orissa Hydro Power Corporation Ltd. (OHPC) …. **Petitioner**

Vrs.

M/s. GRIDCO Ltd.,
M/s Southern Electricity Supply Company of Orissa Ltd. (SOUTHCO)
M/s. Central Electricity Supply Utility of Orissa (CESU)
M/s Western Electricity Supply Company of Orissa Ltd. (WESCO)
M/s North Eastern Electricity Supply Company of Orissa Ltd. (NESCO)
…. **Respondents**

In the matter of: Renovation and Modernization of Unit-I (50 MW) of RHEP, Rengali.

For the Petitioner: Mr. Jagannath Padhi, Director (Operation), Mr. D K Sahoo, GM (Elect.) and Mr. M K Swain, Dy. Manager (Elect.), OHPC Ltd.
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For the Respondents: Mr. L Mohapatra, AGM for GRIDCO Ltd, Mr. S K Dasgupta, CEO and Mr. B P Mohapatra, CFO for CESU, Mr. G B Swain, CSO, Mr. P K Pradhan, CEO, WESCO, Mr. S D Bhanja, DGM & RA of NESCO.

Date of Hearing: 13.11.2009 **Date of Order: 18 .01.2010**

O R D E R

OHPC has submitted an application to the Commission seeking approval for Renovation and Modernization works of Unit-I (50 MW) of Rengali Hydro Electric Project.

2. Mr. Jagannath Padhi, Director (Operation), OHPC stated that the Unit-I (50 MW) of Rengali Hydro Electric Project was commissioned on 27.08.1985 and was in service for last 23 years. Consequent upon major breakdown of this generating unit on 18.08.2008, it

was inspected by M/s BHEL, the Original Equipment Manufacturer (OEM) to assess the quantum of damages. M/s BHEL recommended to replace the old stator bars by new bars with class 'F' insulation and a new set of rotor poles. Further, it was apprehended that cracks might have been developed in the runner blades of Unit-I at any time, as it had already been developed in the runner blades of Unit-II of RHEP, which was commissioned in 1986. Hence, as a preventive measure, the complete replacement of runner set was necessary while carrying out the R&M works. Since there is no spare runner at RHEP from the beginning of the project, a new runner is to be procured from M/s. BHEL, the OEM in accordance with the original drawing and design available with them.

3. The existing excitation system is of semi-static type and the existing AVR system is giving frequent trouble, not being able to generate the required VAR. Similarly, the existing governor is of electro hydraulic type & its response is very slow. The spares for these obsolete AVR & Governor are not readily available. Hence, it has been decided to replace the existing excitation system with digital AVR and Electro-Hydraulic Governor (EHG) with micro-processor based Governor. The existing UE-make relays need to be replaced with numeric relays as they are very old, obsolete and are not repairable.

4. This proposal is for life extension of the generating unit by replacing worn out / damaged/obsolete equipments in water conductor system, Turbine-generator and its control system. The OEM, M/s. BHEL is agreed to take up this work on negotiable contract basis. Hence there is no requirement of any competitive bidding.

5. Up-rating of the runner may lead to replacement of other major items such as thrust and guide bearings, stator core, Generator Transformer etc. which has not been considered in the proposal. Moreover, such exercise will involve additional cost and time causing more revenue loss to OHPC. Hence, up-rating of the Unit-I has not been considered. However, during Residual Life Assessment (RLA) and Life Extension (LE) study of other units, possibility of up-rating of units will be explored. We have already proceeded with M/s. BHEL, the OEM and have decided to renovate all other Units in a phased manner. At that time detailed investigation shall be done to arrive at the up-rating capacity.

6. He further stated that now the Unit-I of RHEP was under forced outage since 18.08.2008 and the peak generation of the station was around 200 MW with the remaining four units and sometimes it was less than 200 MW when any other generating unit was under

outage. After renovation and modernization of Unit-I, the station can generate around 250 MW during peak hours and round the clock during rainy season.

7. In case of non-execution of the R&M work of Unit-I at RHEP, OHPC and the state as a whole will lose 50 MW peak power for all time particularly during monsoon. As a result the GRIDCO will purchase power from outside agency at a higher rate resulting in increase in tariff which shall have to be passed on to the Distribution Companies and ultimately to the consumers. At this juncture, when there is an acute shortage of power in the state, there is an urgent need of renovation and modernization of Unit-I of RHEP, Rengali. Considering the above facts, OHPC Board in its 94th meeting held on 10.07.2009 has approved the proposal to undertake the renovation and modernization of Unit-I of RHEP at the earliest with an estimated cost of Rs.47.5 crore.

8. The representative of GRIDCO stated as under:-

(a) OHPC in its R&M proposal has indicated expenditure of Rs.17.5 cr. towards replacement of turbine runner out of the total estimated cost of Rs.47.5 cr. The necessity for replacing the existing runner has not been elaborated in the project report. However, as a preventive measure, complete replacement of runner set is suggested by OHPC with the following reasons:

i. The existing runner blades having 13% Chromium and 1% nickel have some disadvantages particularly for weld repair.

ii. Since Unit-II runner blade developed cracks, OHPC apprehends that the same problem might occur in Unit-I resulting in break down at any time.

(b) OHPC has not furnished the views and suggestions of the OEM for replacement of runner. The R&M scheme submitted by OHPC is only for life extension of the unit and no up-rating of the unit is proposed by OHPC. Hence, there is no need for replacement of runner without ascertaining and obtaining the views of M/s BHEL who is the supplier of the equipment. OHPC may furnish the required details to examine the need for replacement of the runner.

(c) OHPC in its submission has indicated that M/s BHEL the original equipment manufacturer had agreed to take up this work on negotiable contract basis. But no offers of BHEL have been furnished by OHPC. Further, it is not clear as to whether the estimated cost indicates the present cost or the cost after completion of the project. OHPC may furnish a copy of the offer of BHEL based on which the estimate has been framed.

(d) OHPC in its application has submitted an estimated cost of Rs. 47.5 crore for R&M of Unit-I. But the detailed break up of the estimated cost has not been furnished. So, OHPC may furnish the detail expenditure towards R&M of turbine components, generator components etc., for verification and scrutiny.

(e) From the submission of OHPC it is understood that Unit-I of RPH is under major break down since 8/2008. OHPC should relock to the protection system and take remedial measures to prevent measures to prevent such break down in other units.

(f) In view of the above GRIDCO submitted that thorough scrutiny and verification of the documents of OEM is required before giving concurrence for taking up of the R&M work of Unit-I at RHEP.

9. The submissions of SOUTHCO, WESCO and NESCO are similar in nature and summarized below:

a. The apprehension on developing cracks in the runner of Unit-I of RHEP and as a preventive measure to replace the runner, requires to be re-examined since cost of complete replacement of runner is quite substantial out of the total estimated amount of Rs.47.50 crore.

b. In case, OHPC is allowed to carry out the R&M work of Unit-I of RHEP, the cost involved should be treated as capital expenditure and the depreciation and interest cost of investment need to be considered while calculating the cost of generation.

c. Further, Rengali project is a multipurpose one and flood control being a major purpose, there is secondary generation for four months in rainy season. Hence, secondary generation of the power station need to be considered while calculating the cost of generation.

d. The case may be considered on its merit during the public hearing for approval of ARR and Tariff of OHPC power stations for FY 2010-11.

10. The representative of CESU stated that in financing plan for such R&M of Unit-I at RHEP, OHPC has indicated that the total cost of the project shall be met from OHPC fund. But in the projected tariff after R&M works, they have shown the debt-equity ratio as 70:30. The detailed financing plan with actual loan and equity component should be furnished by OHPC. Further, OHPC has not considered for the possible capacity addition with this R&M programme.

11. After hearing the Petitioner and Respondents, the Commission directed the parties to file their written note of argument within 7 days. OHPC was also directed to take up the

matter with Irrigation Department, GoO to attend the leakage in gates on immediate basis for maximization of generation. The Commission advised that for effective co-ordination and smooth implementation, the Energy Department might arrange a meeting at the level of Chief Secretary and invite APC, Principal Secretary Finance Department and other Senior Officers to workout a time bound action plan for arresting the leakage in dam gates.

12. After perusal of case records, the Commission observed that Unit-I of Rengali Power Station was under forced outage since 18.08.2008 and the Unit was in idle condition for nearly one and half year. From the data /information furnished by OHPC on spillage of water and generation at RHEP during last 10 years, it is observed that sometimes in the rainy season the generating station is not in operation with its full loads even when there is spillage of water. OHPC has indicated that due to opening of gates for spillage of water, the tailrace level was increased causing reduction in net head, thereby decreasing the output of the generating units. Further, it is also observed that sometimes the power station has generated to the extent of its capacity of 250 MW and more with overload even when the gates are opened and there is spillage of water. This could have been possible due to lesser spillage and/or proper co-ordination with Water Resources Department that has not affected the net head of the generating units. In the rainy season all the hydro generating units should be available for generation and OHPC should have effective co-ordination with Water Resources department during spilling of water in rainy season for optimum generation. In the power shortage scenario, the loss of generation due to non-availability of hydro generating unit during monsoon period is a great concern for the State as a whole.

13. If the generating unit operates say at 50 MW (without any overload) during the four months in rainy season (say 100 days excluding forced outage, if any), the energy output would be around 120 MU [(50 MW x 100 days x 24 hours)/1000]. This 120 MU at 58.22 P/U (current average tariff of RHEP) works out to Rs.7 cr. If the R&M works of Unit-I at Rengali is not carried out and the unit remains idle, there is a loss of at least Rs. 7 Cr. per year to OHPC and the State will lose the cheap power of 120 MU per year. Further, in power shortage scenario, GRIDCO has to purchase high cost power from outside. This 120 MU at the differential purchase price of say Rs.2.50 per unit (marginal purchase price of GRIDCO of say Rs.3.10/unit less the average price of Rengali power say 60 P/U) comes to Rs.30 cr., which would be the extra burden on GRIDCO per year.

14. Commission noted the submission of DISCOMs for reexamination of the need for replacement of runner on the apprehension on developing cracks. Commission also noted the submission of OHPC that although Rengali has five (5) generating units of equal size and make there was no spare runner procured as initial spare. Commission directs that in the present R&M proposal a new runner be procured and the existing runner of Unit-2 of RHEP be properly examined and with necessary repair, if required, may be kept as spare runner of the project.

15. In case of R&M of this unit, the estimated capital cost is of the order of Rs.47.5 cr. and the payback period has been calculated by OHPC at 8.3 years based on Rengali generating cost. In consideration of replacement of equivalent power, the payback period of the R&M work of Rengali is less than 2 monsoon seasons. Furthermore, the availability of 50 MW generation will help to meet the peak demand of the State not only in the monsoon period but also during the balance period of the year, when generation in any other power station in the State is affected.

16. Further, the Board of Directors of OHPC has decided to undertake the R&M works of Unit-I of RHEP, Rengali with an estimated cost of Rs.47.5 crore and completion period of two years. OHPC has already taken up the matter with the OEM, M/s BHEL for this R&M work on negotiable contract basis. As per the oral submission of the Director (Operation), OHPC during hearing, they have already placed order on M/s BHEL for procurement of equipments in the context of above R&M works. Taking all the factors into consideration the Commission hereby accords in-principle approval and allows OHPC to undertake the R&M works of Unit-I of RHEP, Rengali at the earliest within the aforesaid estimated capital cost and completion period. The petitioner is also directed to furnish the details of works to be carried out and its estimated cost along with detailed financing plan of the said R&M works to the Commission for assessment of its impact on tariff in future.

17. Accordingly, the matter is disposed of.

Sd/-	Sd/-	Sd/-
(B.K. Misra)	**(K. C. Badu)**	**(B.K. Das)**
Member	**Member**	**Chairperson**

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