



भारतीय प्रौद्योगिकी संस्थान रुड़की

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IITR/WR/DK/MePGCL/1135

Date: 1.10.2015

Mr. M. Rymbai
Superintending Engineer (P & RM)
O/o Director (Generation)
MePGCL, Shillong

Subject: "Petition for Approval of ARR of Myntdu Leshka H.E Project"

Reference: Your Letter No. MePGCL/D/GEN/Misc-43/2008/Pt-VII/59/ Dated 27 August, 2015

Dear Sir,

- With reference to the above letter and as per subject cited above, we would like to inform you that the cost verification of the project work on "Verification of the Completion Cost of Myntdu Leshka H. E. Project (3x42 MW), Jaintia Hills District, Meghalaya", was completed by IIT Roorkee incorporating inputs from various documents provided to us, site visits and personal discussions/clarifications to the extent possible during the course of the study. All relevant inputs are available in the report.
- Now, it has been informed in the letter cited under reference that MSERC has desired as follows,
 "IIT findings on the reasons for the delay in execution of the project resulting in cost overrun (in monetary terms) separately for:-
 (i) Due to factors which are entirely attributable to generating company (imprudence in selecting suppliers and contractual agreements, mismanagement of finances, improper co-ordination, etc.) and
 (ii) Due to factors beyond the control of a generating company (force majeure like natural calamity or any other which clearly establish beyond any doubt that there is no imprudence by the generating company) and
 (iii) For the situations not covered in (i) and (ii) above
 The, MSERC has directed to follow the "Guidelines for formulation of detail project report for hydroelectric schemes and examination for concurrence" issued by CEA in 2007 and the same be indicated in the report".
- In this connection it is reiterated, as already stated in first para of this letter, that the report submitted by IIT is based on the documents as well as information supplied by the project authorities and the study is limited to the scope of work given on page 8 of

the report (Para 1.2). The report contains our findings on the cost of structures such as dam, tunnel, gates, power house, penstock and E& M. Item wise estimated cost, expenditure on work, variation and reasons for variation are given in the report for each structure. The report also contains our observations on the total cost of project along with the circumstances in which the work has been carried out and the reasons for cost of project which has worked out as Rs. 10.27 crores/ MW and is comparable to other on-going similar hydropower projects.

An overview of the details submitted in the report is shown as below.

The project for 2× 42 MW power house was accorded TEC by CEA in 1999 for Rs. 363.08 crores. After all clearances the work on project started in 2004 and contracts awarded for the works based on DPR and on some tender drawings received from the consultants (Central Water Commission). Subsequently when CWC issued some construction drawings, the MLHEP authorities found large variation in quantities of dam etc. and revised the project estimate to Rs. 671.28 crores (which included escalation of Rs.137.36 crores and IDC of Rs. 59.38 crores) and submitted to CEA for approval.

The MLHEP authorities planned to increase the installed capacity by adding one more unit of 42 MW and submitted the proposal to CEA & CWC in Jan 2008 costing Rs. 114.49 crores for approval. The CEA & CWC confirmed the technical and financial feasibility/viability of the proposal but formal TEC was not accorded as cost was less than Rs.500 crores. Later the MePGCL Board approved the cost. Hence the project cost for 3× 42 MW was taken as Rs. 671.29 crores + Rs.114.59 crores = 785.88 crores.

During execution cost of project increased and the project authorities made two revisions in project cost one in 2009 (Rs.965.73 crores) and other in 2010 (Rs. 1173.13 crores) and got it approved by MePGCL Board.

The project was completed and commissioned (all three units) in March 2013 and the completion cost was worked out as Rs.1286.53 crores and was sent to CEA for approval. CEA declined scrutiny of the estimate citing Electricity act 2003. Thereafter IIT Roorkee took up this job as consultancy and submitted the report as per scope of work (TOR) and gave its findings on the increase in cost over and above the approved cost of RS.785.88 crores. Itemwise detailed reasons for increase in cost and time overrun of all the works are given in the report.

The total increase in cost from 2007 to 2013 is Rs. 1286.53 crores – Rs.785.88 crores = Rs.500 crores (Approx.). The total increase of Rs.500 crores mainly comprises of;

- (a) Increase in core hard cost amounting to approximately Rs.55 crores (excluding the cost due to price variation) of main project components (dam, water conductor, penstock, power house and E&M);
- (b) Increase due to price variation is Rs. 34 crores (Approx.);
- (c) Increase due to escalation is Rs.47 crores (Approx.); and
- (d) Payment of Rs.300 crores towards IDC during this period.
- (e) Rest Rs. 65 crores would have been the increase in cost due to roads, buildings, environment and establishment during this period which has not been looked into by IIT, as per Terms of Reference.

Hence out of an increase of Rs.500 crores the increase in core hard cost is only Rs.55 crores. It is found that it is because of change in design to provide measures against acidity of water, changes in design of water conductor and power house and tail race due to addition of 3rd Unit and due to geological problems encountered in execution of penstock anchors and foundation of 3rd Unit in the power house and so it was considered reasonable and acceptable.

The introduction of 3rd Unit after 2008 required changes in the design of Intake, surge tank, tunnel and tail race which delayed the completion of other works. The delay was compounded due to the unprecedented floods in 2009 and 2010. These delays increased the cost of escalation which is worked out as per agreement clause. Hence these were considered acceptable.

The IIT, however felt that the above increase in cost due to change in design for acidity of water, geology and later addition of 3rd Unit could have been minimized had there been timely and coordinated efforts between various agencies involved in planning, investigation and design in the initial stage of the project, but this is easier said than done, because the construction of a hydropower project involves agencies for civil, electrical and mechanical works and the planning and coordination among the three is required to complete the project in minimum time. Hence such time and cost overrun happens for various reasons on practically all the hydropower projects and are considered in the backdrop of the circumstances in which it happens. The circumstances in which it has happened on this project have been explained in the report for further consideration.

Similarly a perusal of the cost flow has revealed that loan was taken from various agencies starting from 2000-01 to 2013-14 whereas the actual construction work started from 2005 and was completed by 2012. The loan was also taken at a high interest rate varying from 12 to 15% annually. This has increased the share of IDC in the project cost to the extent of Rs.342 crores which is slightly more than 25% of total project cost. Better financial management could possibly have reduced this cost. Nevertheless there are many other factors which govern the availability of loan from various sources and this is also, easier said than done.

Our intent in flagging various issues in the report is to ensure that lesson shall be learnt and recurrence shall be avoided in future such projects.

4. Thus it will be seen from forgoing that in our opinion, it is not possible at this stage to precisely trifurcate into the three sub heads in 2nd para of this letter, the reasons for the delay in execution of the project resulting in cost overrun (in monetary terms).
5. However, on the basis of what is brought out in the report by IITR, the broad trifurcation of the core hard cost, (excluding price variation, escalation and IDC etc) into three subheads, of 2nd para of this letter, may be summarized as follows;

(i) Nil,

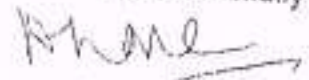
because the investigations of underground strata and geological conditions for design and construction of foundation of any dam, power house or tunnel etc, and site specific parameters like acidity of water in this case, are always concurrent as well as inseparable from corresponding design and construction activities for any hydroelectric project.

(ii) Rs. 4.934 crores , on account of the core hard cost of various activities (like dewatering, removal of silt, construction of protection & river training works , painting & replacement of anodized aluminum works etc., which were necessitated due to floods of 2009 & 2010.

(iii) Nil

6. Likewise the observation of MSERC with regard to follow the guidelines issued by CEA in 2007 for cost verification by IIT, we have to submit that the said guidelines are for formulation of DPR, their acceptance & examination for concurrence and our scope of work was limited to verify the cost of structural components of project from design drawings and to find the reasons for the increase in cost over the approved cost. In our opinion it may not serve any useful purpose to adopt said CEA guidelines of 2007 retrospectively to a project already taken up for construction much before 2007 after TEC by CEA in 1999.
7. Nevertheless incase the MSERC desires recasting various cost components into the formats of 2007 guidelines, the same may be got done at your end because there should not be major variation in the 2007 formats & the formats in earlier guidelines of CEA on the basis of which the revised estimates must have been submitted to CEA at your end in the past.

Yours faithfully



(Deepak Khare)
Principal Investigator