

ODISHA ELECTRICITY REGULATORY COMMISSION
BUDYUT NIYAMAK BHAWAN
PLOT NO.-4, CHUNOKOLI, SAILASHREE VIHAR
BHUBANESWAR - 751021

Present: Shri U. N. Behera, Chairperson
Shri G. Mohapatra, Member

Case No. 88/2020

M/s. Baitarani Power Project Pvt. Ltd.	Petitioner
Vrs.		
DoE, GoO & Others	Respondents

In the matter of: **Application for approval of Project Specific Tariff for the 24 MW Small Hydro-electric Project of the Petitioner, based on Clause 10 of the Order dated 16.02.2019 of the Hon'ble Commission in Case No. 46 of 2018 for finalization of tariff of Renewable Energy Sources including Co-generation for the third Control Period 2018-19 to 2020-21.**

For Petitioner: Shri R. P. Mahapatra, the authorized representative, Shri Y. V. Subha Rao, Shri Amarendra Kumar Maggu, Technical Consultant.

For Respondent: Ms. Sasmita Patajoshi, DGM (PP) and Shri P. K. Das, CGM (PP) of GRIDCO Ltd., Shri Santosh Das, SE (PP), o/o EIC-cum-PCEI and Ms. Sonali Pattnaik, ALO, DoE, GoO.

ORDER

Date of Hearing: 21.12.2021

Date of Order: 15.01.2022

- The Petitioner, M/s. Baitarani Power Project Pvt. Ltd., has constructed a Small Hydro Electric Project (SHEP) of 24 MW (3X8 MW) capacity on river Baitarani under 2003 policy of Government of Odisha for SHEP. The project was cleared by the then State Technical Committee (STC) in its 56th sitting dt. 18.11.2013 with a project cost of Rs.239.19 cr. With no further enhancement, the Techno Economic Clearance (TEC) was issued on 26.02.2014. The project was commissioned in August, 2020 during the third control period. GRIDCO has signed PPA with the developer in 2014 which was subsequently revised and was approved by the Commission in its Order dated 05.07.2016 in Case No. 06/2016. GRIDCO is purchasing power from the developer @ Rs.5.07/unit as per levellised generic tariff.
2. Earlier, in Case No.17/2019 the Petitioner had prayed the Commission that the expenditure incurred by the Developer of the RE Project commissioned during the third control period, towards evacuation infrastructure beyond the interconnection point, including that incurred prior to 2018-19, should be reimbursed by the licensee.

Alternatively, such expenditure may be allowed towards capital cost, in case the Developer opts for project specific tariff, to be determined by the Commission. While disposing the same the Commission in their order dt. 21.08.2020 in Case No.17/2019 in para 23 has observed that *“The Commission has only determined the generic tariff of the SHEPs for specific control period. But the petitioner is at liberty to approach the Commission for project specific tariff if they desire so.”* Accordingly, the Petitioner has filed this application before OERC for determination of project specific tariff on the basis of enhanced project cost of Rs.421.59 Cr. (later revised to 416.59 Cr. by Petitioner) against approved project cost of Rs.239.19 cr.

3. The Petitioner, M/s. BPPPL submitted that during the execution of the project there has been an increase in cost of various items of the project. The project cost for determination of Project Specific Tariff upto the scheduled completion date 24.08.2020 is 421.59 cr. During the execution of the project, force majeure conditions like Geological surprises, Land slide- in downstream of surge shaft, Cyclone Fani, Delay in sanction of additional loan, Land slide – in upstream of surge shaft, Covid-19, and Delay in giving clearance by Government Department/Agency have occurred. Those not only delayed the COD of the SHEP upto 24.08.2020, but also increased the project cost. The Implementation Agreement included the Force Majeure in Para 12. Para 12.2 provides as follows:

“12.2 The term ‘Force Majeure’ as employed herein shall mean (A) an act of god, war, revolt, riot, fire, flood and typhoon and (b) in its application to the company. Act of state being any act omission, restraint, delay for refusal of any governmental agencies, in giving confirming, extending any or all permits, licenses, clearances, way leaves, approvals , sanctions and the like, necessary for the construction, operation and maintenance of the project, or the procurement, transport , storage and use of any spares, main power etc. for the project.”

The Petitioner has given a detailed list of events which have led to the upward revision of capital cost. There are as follows:

- Increase in cost of acquisition of project land;
- Due to loose strata at foundation levels of barrage and intake area, the concrete grade had been changed from M-20 to M-25 and therefore quantity of reinforcement steel increased;
- Length of headrace tunnel increased by 26 mtr considering the geological conditions resulting in an increase in rock excavation quantity by 2,980 cum;

- Excavation quantity of soil increased by 7,735 cum and of hard rock increased by 15,411 cum for the stability of rock slopes on the upstream and down-stream site of surge shaft;
- For optimizing the location of surge shaft, 935 cum of M-25 grade concrete has increased in design of surge shaft to meet the penstocks restricted length for optimizing size of generator;
- Steel liner for penstock had not been considered in DPR and therefore quantity of steel increased by 300 MT;
- Due to poor geology on the left side of the powerhouse, additional rock bolts and 2,100 cum of M-10 grade concrete was provided for further stability;
- For stability against vibrations by turbine, 4,360 cum of M-15 grade replaced by M-25 grade concrete;
- Due to change in location of Tail Race Channel, length of Channel increased by 224 m;
- There was no provision in DPR for infrastructure works. The site is in a very remote area and thus access roads, accommodation facilities for staff and skilled labour were constructed;
- Increase in cost of civil works due to change in cost of materials and labour;
- Increase in the cost of centering, scaffolding & Misc. items which were assessed by Project Consultants;
- Increase in cost of diesel, cement and steel from Dec. 2017 to Oct. 2018 has been considered;
- There was no provision for Surge Shaft gates in the approved DPR. The surge shaft gates were included taking into account the upsurge;
- Even though a nominal amount of Rs.3.0 cr. was provided towards Project Management cost, the actual expenditure incurred upto COD of the project is Rs.38.38 cr.; and
- With implementation of GST and increase in scope of work, taxes and duties have also increased.

However, there is no change in other parameters for determination of tariff as mentioned at Para 20 and 21 of the order of the Commission in Case No. 46/2018 which specifies the generic tariff for the third control period.

4. M/s. BPPPL has further submitted that for the purpose of availing debt the petitioner has entered into financial arrangements with IREDA for an amount of Rs.135.08 cr., PFC for Rs.103.76 cr. and IIFCL for Rs.64.17 cr. The actual IDC upto COD of the project is Rs.82.39 cr. The Petitioner has pointed out that Para 25(b) of the order dated 16.02.2019 of the Commission in Case No.46/2018 has specified the normative CUF of 30% for the generic tariff determination. Accordingly, the corresponding annual generation works out to be 63.07 GWh. Based on the latest 10 year data available for the years 2005-06 to 2014-15, the total generation and dependability have been calculated with 95% plant availability. The energy generation for a 75% dependable year i.e. 2009-10, works out to 88.69 GWh, with corresponding CUF of 42.18%. Based on CUF of 42.18% levellised tariff for 35 years has been calculated with and without MNRE subsidy which works out to Rs.7.26/Kwh and Rs.7.29/Kwh respectively.
5. The developer was asked to undertake model study of the barrage structure in consultation with WAPCOS in December, 2010. In accordance with the technical recommendations of WAPCOS, revised DPR was submitted by the developer incorporating the changes in the design, drawings and cost of the project was circulated among STC members. The total project cost has been estimated in the revised DPR to be Rs.239.19 cr. After due deliberations by members on the issues relating to cost of the project in their 56th meeting held on 18.11.2013, the DPR had been cleared with stipulations that all the recommendations of WAPCOS would be strictly followed during execution. A comparative statement of project cost is provided below:

Project cost claimed by Petitioner

Table-1				(In Rs Crore)
Sl. No	Description	Project Cost (TEC)	Increase in Cost	Completion Cost upto COD
1	Cost of Land and Site Development	3.10	1.91	5.01
2	Civil Works	109.46	45.09	154.55
3	Electro Mechanical Equipment	41.40	0.08	41.48
4	Hydro Mechanical Equipment	37.80	2.84	40.64
5	Engineering & Consultancy	2.50	0.00	2.50
6	Project Management	3.00	35.38	38.38
7	Others –Transmission Lines for Evacuation	19.00	0.99	19.99
8	Taxes & Duties	10.64	26.01	36.65
9	Total Cost	226.90	112.30	339.20

Sl. No	Description	Project Cost (TEC)	Increase in Cost	Completion Cost upto COD
10	Interest during Construction (IDC)	12.29	70.10	82.39
11	Total Project Cost	239.19	182.40	421.59
12	Less: MNRE Subsidy	-5.80	-5.00	-5.00
13	Net Project Cost	233.39	177.40	416.59

6. The Respondent, GRIDCO submitted that GRIDCO had appointed an expert to analyse the tariff proposal. The TEC was issued on 26.02.2014 by the STC approving the project cost of Rs 239.19 Cr. covering the construction period of 36 months including IDC. The aspect of cost escalation during the 36 months' construction period had already been taken into consideration in the approved project cost of Rs 239.19 Cr. As STC has not approved the increase in project cost of the SHEP, there is no basis for increase of any tariff. Since the Lower Baitarani SHEP is a State Project governed under the OERC Generic Tariff Order, the claim for higher tariff by the Petitioner on the basis of CERC Tariff Order is not maintainable and needs no consideration.
7. GRIDCO has submitted that as per the 2nd STC MoM dated 17.08.2021, COVID-19 and cyclone FANI has little impact on delay of the project. Regarding delay in sanction of additional loan, it is the sole responsibility of Developer as per clause 13.1 of the PPA. GRIDCO has further submitted that the significant variation of Rs.14.25 Cr. in bill of quantities under civil work as per DPR and construction drawing, have not been approved by any competent agency. Moreover, certain assets like computer softwares, motor vehicles, furnitures, Computer, UPS, site equipment, etc. amounting to Rs 10.45 Cr. is shown as part of civil works whereas these were not in the DPR as component of civil works.
8. Regarding IDC, GRIDCO has submitted that as per clause 9.0 of the PPA dated 18.12.2015, in case of delayed commissioning beyond SCOD of 36 months the IDC shall not be capitalized and shall be borne by the Developer, therefore it may be disallowed. Against the claim of Rs.82.39 Cr. by Developer with interest rate of 12% as per the approved DPR, IDC calculated by GRIDCO for 12 quarters amounts to Rs.24 Cr. Further, the claimed project management expenses of Rs.38.34 Cr. is exorbitant than what is judiciously approved by STC for Rs.3 Cr. Hence, the enhanced project management expenses may not be allowed as it was the obligation of Developer.
9. GRIDCO has further submitted that the taxes and duties of Rs.36.39 Cr. claimed by the Petitioner on actual payment basis is the result of enhanced project cost beyond the

approved limit. The same should be considered proportionally only subject to submission of proof of actual payment. The actual allowance under taxes and duties may kindly be allowed to the maximum limit of Rs.29.37 Cr. Further, as the DPR does not consider any short term assets, the adjustment of Rs.0.43 cr. from the sale of fixed assets in the project cost towards disposal of asset is not accepted. Regarding MNRE subsidy of Rs 5 Cr., it shall be deducted from the total project cost while determining the Project Specific Tariff. As per the final due-diligence report, the admissible project cost is Rs.290.48 cr. against the claim of Rs.416.59 cr. excluding the MNRE subsidy of Rs 5 Cr. and the infirm power cost of Rs.0.36 cr. The indicative tariff for the SHEP is Rs.4.85/kWh, considering the tariff norms for SHEPs with capacity 5 MW to 25 MW commissioned under 3rd control period specified by Commission vide Order dated 16.02.2019 in Case No.46/2018. STC has further suggested for considering useful life of project as 40 years in place of 35 years while determining project specific tariff so as to further reduce the tariff. Cost escalation beyond the STC approved capital cost, if approved within the norms may be considered to be spread over a period of 40 years.

10. As per GRIDCO's report on due diligence, the acceptable project cost submitted by GRIDCO is as under:

Project cost as per Calculation of GRIDCO

Table-2				(In Rs Crore)
Sl. No	Description	Cost as per Certificate of Developer (Rs Cr.)	Acceptable Cost (Rs Cr.) by GRIDCO	Difference (Rs Cr.)
1	Cost of Land and Site Development	5.01	5.01	0
2	Civil Works	154.55	129.85	24.7
3	Electro Mechanical Equipment	41.48	41.48	0
4	Hydro Mechanical Equipment	40.64	40.64	0
5	Engineering & Consultancy	2.5	2.5	0
6	Project Management	38.38	3.00	35.38
7	Others –Transmission Lines for Evacuation	19.99	19.99	0
8	Cost Excluding Taxes	302.55	242.47	60.08
9	Taxes & Duties	36.65	29.37	7.28
10	Effective Tax Rate	12%	12%	-
11	Total Cost	339.20	271.84	67.36
12	Interest during Construction (IDC)	82.39	24	58.39
13	Total Project Cost	421.59	295.84	125.75
14	Less: MNRE Subsidy	-5.00	-5	0
15	Infirm Power		-0.36	0.36
16	Net Project Cost	416.59	290.48	126.11

11. Another Respondent, EIC (Electricity)-cum-PCEI, Odisha has submitted that necessary time extensions have been allowed to the developer by Department of Energy, Government of Odisha without any escalation in the project cost. The DPR which includes project cost is approved by STC, hence, increase in project completion cost is also to be accepted and approved by the STC. Further, the arrangement of finances of the project is the sole responsibility of the developer. The developer is required to submit the project completion cost for approval of the STC as per the TEC issued for the project. A meeting of the STC was conducted on 13.08.2021 on the issues of project completion cost as per the directions of OERC dated 06.07.2021. The STC observed that a) On geological surprises leading to increase in cost of civil works, the same needs to be verified by experts; b) Cyclone FANI and COVID-19 have little impact on the delay in commissioning of the project, hence, not agreeable; c) The increase in total project cost due to increase in project management and IDC is not acceptable since the project is delayed by less than 2 years. Increase in IDC needs rigorous due diligence; d) Project specific tariff should not be allowed. If at all it is absolutely essential to determine project specific tariff, the generic tariff derived by CERC i.e. Rs.5.71/Unit may be considered as the upper limit and maximum allowable limit after duly taking into consideration the views of GRIDCO; and e) The useful life of the SHP may be considered as 40 years as per CERC norms to reduce the levelled tariff.
12. The Petitioner objected to GRIDCO's proposal of STC approving the completed cost and requested the Commission to appoint an independent consultant to verify the completed cost. The petitioner has also submitted that the OERC order No.46/2018 dt.16.02.2019 regarding project specific tariff does not specify that the completed cost to be approved by STC. The delay in commissioning i.e. upto August, 2020, occurred solely on account of Force Majeure conditions. The geological surprises, landslide downstream of surge shaft, land slide-upstream of surge shaft could not be predicted as a part of site study. The lending institutions like IREDA, IIFCL and PFC are "Governmental Agencies". According to para 12.2 of the implementation agreement dt.14.03.2014 between the Government of Odisha and the petitioner, any delay or refusal of any Governmental Agencies is construed as a Force Majeure condition. The PPA clause 9.0 on delayed commissioning states that "*in case of delayed commissioning which is attributable to the developer, except force majeure, the IDC shall not be capitalized and shall be borne by BPPPL.*" Hence, the delay due to force majeure events of 15 months along with the associated costs shall be taken into consideration while determining tariff.

13. As per the TEC issued by STC, *“The completion cost of the scheme shall be submitted to the STC for approval within the period of 3 months from the commencement of operation of the plant.”* The Commission in its interim Order dated 06.07.2021 had directed the Petitioner to submit its application before STC for approval of its project completion cost. Moreover, being the nodal Agency, EIC-cum-PECI was directed to give their report on the approval of project cost by STC. The STC in their MoM dated 13.08.2021 had expressed that they do not presently have arrangements to determine the project completion cost. Accordingly, the Commission on the request of the Petitioner and GRIDCO appointed a Technical Consultant (TC) for detailed review of the capital cost and give final recommendation of project specific capital cost.
14. The Technical Consultant after evaluation made the following submissions:
- i. IDCO has acquired both private and government land on behalf of the Project and the cost of acquisition has increased substantially for private land after implementation of the Land Acquisition Act, 2013 which resulted in increase in Cost of Land from Rs.3.10 Cr. considered at DPR Stage to Rs.5.01 Cr. at the time of acquisition. Therefore Rs 5.01 Cr. considered by the Developer in the completed cost has been retained by TC.
 - ii. Bill of Quantities has been arrived at based on as built drawings and report of Design Consultant (ICCS) and estimation of Cost has been done using SSR/ Labour/ Equipment Hiring Rates as notified by Government of Odisha. Cement and Steel rates have been adopted as per cement invoices of BPPPL and SAIL rates at Rourkela respectively. The Estimates also include Cost of Power for Construction and cost of Special Tools & Plants. Based on analysis, estimated cost of Rs.143.00 Cr. is recommended.
 - iii. The Cost Estimate for Electro Mechanical Equipment considered at DPR stage and approved by STC in TEC is Rs.41.40 Cr. against which completed cost claimed is Rs.41.48 Cr. Considering negligible increase in cost, the Estimated Cost of Rs.41.48 Cr. is recommended for acceptance.
 - iv. The Cost Estimate for Hydro Mechanical Equipment considered at DPR stage and approved by the TEC is Rs.37.80 Cr. against which completed cost claimed is Rs.40.64 Cr. Increase in cost is on account of provision for Surge Shaft gates (not envisaged at the DPR Stage) taking into the account the upsurge. Estimated Cost of Rs.40.64 Cr. is recommended for acceptance.

- v. The Cost Estimate under the Estimated Cost of Engineering & Consultancy at the DPR Stage was Rs.2.50 crores. There is no change in Cost under this head in the Completed Project Cost. Therefore of Rs.2.50 crores is recommended for acceptance.
- vi. Project Management Cost considered at DPR stage and approved by the STC in TEC is Rs.3.00 Cr. Developer has carried out execution of Civil & Transmission Works through their own procurement and execution teams, which would require more manpower and resources as compared to Execution through EPC or Works Contract mode. Therefore, DPR provision of Rs.3.00 Cr. is considered too low and inadequate. Project Management is estimated in the range of 10 – 12% as per CEA guidelines and 8 - 10% as per MNRE Guidelines. Therefore estimation has been done at 8% of estimated Cost (excluding Taxes & Duties) of Civil & Transmission Line works of Rs.162.98 Cr. which works out to Rs.13.04 Cr. After adding Finance & Legal Charges of Rs.6.48 Cr. actually incurred, Estimated Cost comes to Rs.19.52 Cr. which is recommended for acceptance.
- vii. Cost Estimate for construction of Transmission Line for Power Evacuation considered at the DPR Stage and approved by STC in TEC was Rs.19.00 Cr. The marginal increase in cost is on account of increase in actual length of transmission line to 34 km against 32 km provided at DPR stage. This increase in cost on account of increase in scope is considered reasonable and therefore is recommended for acceptance.
- viii. Provision for Taxes and Duties made at stage of DPR/ TEC approval is Rs.10.64 Cr. During the course of execution, the tax regime has changed from Excise Duty/ VAT, Sales Tax, Entry Tax etc. to GST Regime from 01.07.2017 onwards. There has been a considerable impact on cost of the Project on this account. The Cost of Rs.36.39 Cr. being the actual amount of Taxes & Duties paid by Developer to the Government, it is recommended that the same may be accepted.
- ix. The IDC has been estimated based on the revised cost of Rs.308.52 Cr. taking into consideration the assumptions such as Capitalization of IDC, Construction Period of 44 Months, Interest Rate of 13% (Average Interest Rate of all three lenders in Consortium namely IREDA, PFC & IIFCL), and Loan Amount of 70%, i.e. Rs.216.03 Cr. Based on these assumptions, the revised IDC works out to Rs.57.27 Cr. as compared to the IDC computed as Rs.33.44 Cr. at DPR Stage with construction period of 36 months. The increase in IDC has occurred on

account of increased construction period of 8 months and increased cost of construction materials, labour wages, Project Management expenses and change of tax regime to GST with effect from July 2017. Estimated Cost of Rs.57.27 Cr. is recommended for acceptance on the account of IDC.

- x. Adjustments proposed in the Project Cost include: a) Infirm Power Sale (Pre COD): Rs.0.15 Cr.; b) Recovery on Fixed Assets: Rs.0.43 Cr.; c) MNRE Subsidy: Rs.4.75 Cr.; and d) Total Adjustment in Project Cost: Rs.5.33 Cr.
- xi. Taking the above Estimation and adjustments, the Completed Project Cost of Rs.360.45 Cr. say Rs.360 Cr. is recommended for acceptance as against Rs.416.59 Cr. claimed by Developer.
- xii. Findings of Hydrological studies indicate that flows of Baitarani River during DPR preparation was consistently higher as compared to flows during the petition stage which signifies that discharges have reduced in the river over time due to reduced rainfall in river catchment.
- xiii. Average CUF works out to 39.58% say 40% which has been adopted in our Analysis.
- xiv. Plant Efficiency has been adopted as 91% in Petition which is on higher side. As per Performance tests carried out by Jadavpur University, it works out to 86.68% which almost matches with weighted average efficiencies of Turbine & Generator guaranteed by E&M Contractor.
- xv. Annual Energy Generation at 75% dependability works out to 84.85 MU at 40.33% CUF which matches with actual energy generation figures.

15. The following cost was proposed by the TC in its final report:

Project cost as recommended by TC

Table-3

(In Rs Crore)

Sl. No.	Description	Original Approved Cost by STC (Rs Cr.)	Completion Cost Claimed by BPPPL (Rs Cr.)	Cost Recommended by TC (Rs Cr.)
1	Cost of Land and Site Development	3.10	5.01	5.01
2	Civil Works	109.46	154.55	143.00
3	Electro Mechanical Equipment	41.40	41.48	41.48
4	Hydro Mechanical Equipment	37.80	40.64	40.64
5	Engineering & Consultancy	2.50	2.50	2.50
6	Project Management	3.00	38.38	19.52
7	Others –Transmission Lines for Evacuation	19.00	19.99	19.98

Sl. No.	Description	Original Approved Cost by STC (Rs Cr.)	Completion Cost Claimed by BPPPL (Rs Cr.)	Cost Recommended by TC (Rs Cr.)
8	Taxes & Duties	10.64	36.65	36.39
9	Total Cost	226.90	339.20	308.52
10	Interest during Construction (IDC)	12.29	82.39	57.27
11	Total Project Cost	239.19	421.59	365.79
12	Adjustment in Project Cost			
A	Infirm Power Sale (Pre COD)			-0.15
B	Recovery on Fixed Assets			-0.43
C	MNRE Subsidy	-5.80	-5.00	-4.75
D	Total Adjustments in Project Cost	-5.80	-5.00	-5.33
13	Total Project Cost	233.39	416.59	360.45

16. BPPPL has submitted that the Revised Project Timeline has been changed to 44 months from actual completion period of 51 months. Their specific comments on taxes & duties, project management expenses, interest during construction are most relevant. BPPPL further submitted that the annual gross energy of 101 MU (40%) approved by the STC in 2013 is based on the hydrology of 1988 with 75% dependability whereas the energy of 88.69 MU (42.18%) considered by them in the year 2020 after COD is based on hydrology of 2005 – 2015 which is more recent and just before commencement of construction work. It may be mentioned that the TC has compared the flows and has observed that the discharges have reduced in river Baitarani over time due to reduced rainfall in the river catchment. Earlier while filing the petition in December, 2020 plant efficiency of 91% for calculation of annual energy was considered. The Jadavpur University conducted performance test in January, 2021, i.e. after the submission of petition and have arrived at plant efficiency of 88.69%. Accordingly, CUF was modified from 42.18% to 40.33%.
17. BPPPL submitted that IDC calculation should be considered only on a proportionate basis to the hard cost, since it is representative of the Actual Load Disbursement. The revised tariff for 25/35/40 years has been made considering the project cost as under:
- As per TC report: Rs 360.54 Cr. (A1, A2, A3)
 - Revised cost with revised IDC calculated proportionately: Rs 383.48 Cr (B1,B2,B3)
 - As per petition cost: Rs.416.59 cr.(C1,C2,C3)

Project cost proposed by BPPPL on proportionate IDC calculation

Table-4

	Capital cost (In Rs Crore)	CUF(%)	Tariff calculation period (years)	Tariff/PPA period (Years)	Depreciation till PPA period (Rs Cr./%)	Tariff (Rs./kWh)
CASE-A1	360.54	40.33	25	25	90.00	6.87
CASE-A2			35	35		6.77
CASE-A3			40	40		6.77
CASE-B1	383.48	40.33	25	25		7.23
CASE-B2			35	35		7.11
CASE-B3			40	40		7.11
CASE-C1	416.59	40.33	25	25		7.75
CASE-C2			35	35		7.60
CASE-C3			40	40		7.60

18. BPPPL further submitted that they accept adjustments in project cost of Rs 5.33 Cr. on account of (i) infirm power sales of Rs 0.15 Cr.; (ii) Recovery from sale of fixed assets of Rs 0.43 Cr.; and (iii) MNRE subsidy of Rs 4.75 Cr. which were proposed by the TC. It can be observed from the analysis of rates given by TC for 2017, 2018 and upto COD that the rate for some of the items is constant without any increase. The TC has not considered increased labour rates and material rates like cement which led to cost of civil works as Rs 143.00 Cr. as against actual expenditure of Rs 154.86 Cr. Further, the project management expenses of Rs 19.52 Cr. by TC against Rs 38.34 Cr. actually incurred is too low. The benchmark value of 8% as per AHEC has been considered by the TC. The benchmark values are considered in preparing DPR but in commissioned projects they have to be considered based on actual expenditure.
19. Regarding the report of TC, GRIDCO submitted that it is considering only 36 months that is allowed in the PPA dated 18.12.2015 against the recommendation of 44 months by the TC and 51 months by the petitioner and the project cost within this timeline approved by the STC for project timeline. As observed by the TC, the developer has made major changes in the structure than the approved DPR without the proper approval. As per the PPA dated 18.12.2015, the annual gross energy from the project, as approved by the STC is 101 MU (net saleable energy is 99.99 MU) for arriving the project specific tariff. The actual generation of the 24 MW lower Baitarani SHEP over the past one year is matching the committed energy. The claim of the petitioner on less generation potential based on the observations of the TC is erroneous and not based on the facts. The claim of the Petitioner on lesser generation is also not in the scope of the present petition. While determining the project specific tariff, the approved saleable energy of 99.99 MU per annum is to be considered. GRIDCO does not agree to any of the tariff

calculation with CUF alteration as claimed by the petitioner. As the DPR does not consider any short term assets, the adjustment of Rs.0.43 cr. from the sale of fixed assets in the project cost towards disposal of asset is not accepted.

20. GRIDCO further submitted that geological surprises, landslide downstream of surge shaft, landslide upstream of surge shaft are common to hydel projects and could have been ascertained through proper survey and soil testing process. These events are never reported during their occurrence to GRIDCO either by the Petitioner or the State Nodal Agency. It is submitted that for events like cyclone, Fani, Covid-19 pandemic & delay in according clearance by concerned department/GoO agency, time extension has been allowed by the concerned department/GoO to the SHEP for around 20 months beyond the scheduled CoD.
21. The Petitioner submitted that the work order issued by the Commission to TC mentioned *“Variation if any on power generation potential and net head”* in the scope. Hence the submission by GRIDCO that the assessment of the generation potential as carried out by TC is beyond the scope of the present petition is not correct. In line with the CUF calculations of 40.33% by TC at 75% dependability i.e. considering 84.85 MUs annual generation the tariff calculated has been revised to Rs 7.60/ kWh considering project cost of Rs 416.59 Cr. for PPA term of 40 years and CUF of 40.33%.
22. The Petitioner has prayed the Commission to determine the project specific tariff based on the revised project cost of Rs 416.59 Cr. and the revised project timeline and to determine tariff for a life of 40 years for the project with directions to the state government to revise the MoU executed for this project for a period of 40 years and also direct GRIDCO to enter into a revised PPA for drawl of power for 40 years.
23. Heard the Parties. After going through the submissions of M/s. BPPPL, M/s. GRIDCO and the TC appointed by the Commission, a comparative analysis of the project cost submitted by them was carried out. The table below shows head-wise comparative analysis of the project cost:

Comparative Project costs as per STC, BPPPL, GRIDCO & TC

Table-5

(In Rs Crore)

Sl. No	Description	Original Approved Cost by STC (Rs Cr.)	Completion Cost Claimed by BPPPL (Rs Cr.)	Acceptable Cost for GRIDCO (Rs Cr.)	Cost Recommended by TC (Rs Cr.)
1	Cost of Land and Site Development	3.10	5.01	5.01	5.01
2	Civil Works	109.46	154.55	129.85	143.00
3	Electro Mechanical Equipment	41.40	41.48	41.48	41.48

Sl. No	Description	Original Approved Cost by STC (Rs Cr.)	Completion Cost Claimed by BPPPL (Rs Cr.)	Acceptable Cost for GRIDCO (Rs Cr.)	Cost Recommended by TC (Rs Cr.)
4	Hydro Mechanical Equipment	37.80	40.64	40.64	40.64
5	Engineering & Consultancy	2.50	2.50	2.50	2.50
6	Project Management	3.00	38.38	3.00	19.52
7	Others –Transmission Lines for Evacuation	19.00	19.99	19.99	19.98
8	Taxes & Duties	10.64	36.65	29.37	36.39
9	Total Cost	226.90	339.20	271.84	308.52
10	Interest during Construction (IDC)	12.29	82.39	24	57.27
11	Total Project Cost	239.19	421.59	295.84	365.79
12	Adjustment in Project Cost				
A	Infirm Power Sale (Pre COD)			-0.36	-0.15
B	Recovery on Fixed Assets				-0.43
C	MNRE Subsidy	-5.80	-5.00	-5.00	-4.75
D	Total Adjustments in Project Cost	-5.80	-5.00	-5.36	-5.33
13	Total Project Cost	233.39	416.59	290.48	360.45

24. According to the submissions made by the Parties as well as the Technical Consultant appointed by the Commission, the Commission made the following observations regarding project cost:

i. Cost of Land and Site Development:

It is observed that since the DPR stage, cost of acquisition has increased substantially for private land which resulted in increased cost of land. Since BPPPL, GRIDCO and the TC have agreed to this increase in cost, therefore the Commission approves the cost of Rs 5.01 Cr. under this head.

ii. Civil Works:

The STC has recommended verification of geological surprises by experts. From the report of TC, the Commission observes that there have been certain geological surprises which resulted in design changes there from during the course of execution of the project. The Commission, considering the views of the TC, approves the cost of Rs 143.00 Cr. under this head.

iii. Electro Mechanical Equipment:

Considering negligible increase of Rs 8 lakhs from the original cost approved by STC in TEC, and since BPPPL, GRIDCO and the TC have agreed to this increase in cost, the Commission approves the cost of Rs 41.48 Cr. under this head.

iv. Hydro Mechanical Equipment:

The Commission observes that the increase of Rs 2.84 Cr. from the STC approved cost is on account of provision for Surge Shaft gates which was not envisaged at DPR Stage taking into account the upsurge as mentioned by TC. Since BPPPL, GRIDCO and the TC have agreed to increase in this cost; therefore, the Commission approves the cost of Rs 40.64 Cr. under this head.

v. Engineering & Consultancy:

Since there is no change in Cost under this head in the Completed Project Cost as compared to originally STC approved cost, the Commission approves the cost of Rs 2.50 Cr. under this head.

vi. Project Management:

Project Management Cost originally approved by the STC in TEC was Rs 3.00 Cr. as compared to Rs 38.38 Cr. Proposed by the petitioner. It can be observed that there is a thirteen-fold increase in Project Management cost in less than 2 years of delay as outlined in the 2nd STC MoM dated 17.08.2021 as well as by GRIDCO. Both STC and GRIDCO strictly did not agree to any increase in the Project Management Cost. The Commission also believes that such a huge increase in Project Management cost is unjustified. The Commission therefore approves the cost of Rs 3.00 Cr. under this head.

vii. Others –Transmission Lines for Evacuation:

The Commission observes that marginal increase in cost under this head is on account of increase in actual length of transmission line to 34 km against 32 km provided at DPR stage as pointed out by the TC. Since BPPPL, GRIDCO and the TC have agreed to this cost, the Commission approves the cost of 19.99 Cr. under this head.

viii. Taxes & Duties:

As per analysis, cost of taxes and duties paid to Government by the Petitioner during the previously approved construction period amounts to Rs 31.07 Cr including the change in new tax regime. Accordingly, the Commission approves the cost of Rs 31.07 Cr. under this head.

ix. Interest during Construction (IDC):

The TC has considered 44 months for calculation of IDC and has mentioned that this increase has occurred on account of increased construction period of 8 months and increased cost of construction materials, labour wages, etc. It may be noted that as stated by EIC-cum-PCEI, necessary time extensions were allowed to the developer by Department of Energy, Government of Odisha without any escalation in the project cost. It is observed that clause 9.0 of the PPA dated 18.12.2015 mentions that in case of delayed commissioning beyond SCOD of 36 months except for force majeure conditions, the IDC shall not be capitalized and shall be borne by the developer. Further, as per the 2nd STC MoM dated 17.08.2021, the STC mentioned that Cyclone FANI and Covid-19 have little impact on the Commissioning of the project. Considering the huge increase in IDC by almost 7 times than original and also considering the submissions made by GRIDCO and the STC, the Commission is of the view that a period of 36 months is to be considered for calculation of IDC. For construction period of 36 months as per the approved DPR, the TC has arrived at a cost of Rs 33.44 Cr. considering a Hard Cost of Rs 255.78 Cr. in its report. As per the Commission's analysis, the Hard Cost is arrived at Rs 255.62 Cr. which is closer to what was calculated by the TC for 36 months. The Commission accordingly recognizes and approves the cost of 33.44 Cr. under this head.

x. Adjustments in Project Cost:

The Commission recognizes the adjustment of Rs 5.33 Cr. to the total project cost as suggested by TC on account of Infirm Power Sale, Recovery on Fixed Assets and MNRE subsidy. The same shall not be considered while calculating the total project cost.

25. As per the observations of this Commission under Para 24 above, the final project cost approved by the Commission is as under:

Final Project Cost Approved by the Commission

Table-6

(In Rs Crore)

Sl. No.	Description	Original Project Cost approved by STC	Completion Cost Claimed by BPPPL	Project Cost approved by OERC
1	Cost of Land and Site Development	3.10	5.01	5.01
2	Civil Works	109.46	154.55	143.00
3	Electro Mechanical Equipment	41.40	41.48	41.48

Sl. No.	Description	Original Project Cost approved by STC	Completion Cost Claimed by BPPPL	Project Cost approved by OERC
4	Hydro Mechanical Equipment	37.80	40.64	40.64
5	Engineering & Consultancy	2.50	2.50	2.50
6	Project Management	3.00	38.38	3.00
7	Others –Transmission Lines for Evacuation	19.00	19.99	19.99
8	Taxes & Duties	10.64	36.65	31.07
9	Total Cost	226.90	339.20	286.69
10	Interest during Construction (IDC)	12.29	82.39	33.44
11	Total Project Cost	239.19	421.59	320.13
12	Adjustment in Project Cost	-5.80	-5.00	-5.33
13	Total Project Cost (after adjustments)	233.39	416.59	314.80

Accordingly, the Commission recognizes the total project cost of Rs 314.80 Cr. as against the cost of Rs 416.59 Cr. claimed by the Petitioner.

26. Apart from the modified parameter, i.e. CUF and total project cost decided in the above paras, other input technical and financial parameters have been considered from parameters for SHP in Case No. 46/2018 of OERC on Tariff of Renewable Energy Sources including Co-generation for the third control period 2018-19 to 2020-21. The tariffs for both 35 and 40 years have been calculated separately. The overall Parameters considered for calculation of Tariff is provided in the table below:

Parameters and Assumptions for Tariff Calculation for 35 years

Table-7

No	Technical Parameters	Value	Unit
1	Capacity of the Power Project	1	MW
2	Capacity Utilization Factor	40.33%	%
3	Annual gross energy Generation	35.33	Lakh kWhs
4	Auxiliary consumption	1.00	%
5	Net energy generation	35.15	Lakhs
6	Life of Plant and Machinery / Project Life	35	years
No	Financial Parameters	Value	Unit
1	Project Cost of 1 MW SHP plant	1312	Rs Lacs/MW
2	Non depreciable cost	10.00%	% of Capital Cost
3	Depreciable Amount	1180.50	lacs
4	Debt Fraction	70.00%	%
5	Debt	918.17	lacs
6	Equity	393.50	lacs
7	TOTAL	1311.67	lacs
8	Interest Rate on Term Loan	9.97%	%
9	Repayment Period	13	years

10	No of installments for Interest on Term Loan	13	years
11	Moratorium Period	0	years
12	Term loan period for principal payment	13	years
13	Depreciation (Straight Line Method, Company Law) (for first 12 years)	5.28%	%
14	Discount Rate	9.15%	%
15	O&M + Insurance Cost	22.2	lakhs /MW
16	O&M + Insurance Cost Escalation	5.72%	%
17	Return on Equity	17.56%	%
18	Annuity Factor (35 Years)	10	
19	Interest on working capital	10.97%	%
	Levellized Tariff (for 35 years)		Rs 5.99/ kWh

Parameters and Assumptions for Tariff Calculation for 40 years

Table-7

No	Technical Parameters	Value	Unit
1	Capacity of the Power Project	1	MW
2	Capacity Utilization Factor	40.33%	%
3	Annual gross energy Generation	35.33	Lakh kWhs
4	Auxiliary consumption	1.00	%
5	Net energy generation	35.15	Lakhs
6	Life of Plant and Machinery / Project Life	40	years
No	Financial Parameters	Value	Unit
1	Project Cost of 1 MW SHP plant	1312	Rs Lacs/MW
2	Non depreciable cost	10.00%	% of Capital Cost
3	Depreciable Amount	1180.50	lacs
4	Debt Fraction	70.00%	%
5	Debt	918.17	lacs
6	Equity	393.50	lacs
7	TOTAL	1311.67	lacs
8	Interest Rate on Term Loan	9.97%	%
9	Repayment Period	13	years
10	No of installments for Interest on Term Loan	13	years
11	Moratorium Period	0	years
12	Term loan period for principal payment	13	years
13	Depreciation (Straight Line Method, Company Law) (for first 12 years)	5.28%	%
14	Discount Rate	9.15%	%
15	O&M + Insurance Cost	22.2	lakhs /MW
16	O&M + Insurance Cost Escalation	5.72%	%
17	Return on Equity	17.56%	%
18	Annuity Factor (40 Years)	11	
19	Interest on working capital	10.97%	%
	Levellized Tariff (for 40 years)		Rs 6.00/ kWh

27. The State Technical Committee in their 2nd meeting held on 13.08.2021 had suggested the Commission not to allow project specific tariff and if at all it is absolutely essential to

determine project specific tariff, the generic tariff derived by CERC i.e. Rs.5.71/ Unit may be considered as the upper limit and maximum allowable limit after duly taking into consideration the views of GRIDCO. Accordingly, the Commission after taking a note of suggestions of STC approves the tariff of Rs 5.71/ kWh for 24 MW Baitarani SHEP. It is upto GRIDCO to decide whether to procure power from the project for 35 years or for 40 years. Amendments to PPA may be made accordingly by both the parties if necessary. The project specific tariff thus approved shall be effective from 01.02.2022 for energy to be sold to GRIDCO.

28. The case is accordingly disposed of.

Sd/-
(G. Mohapatra)
Member

Sd/-
(U. N. Behera)
Chairperson