BALIMELA PUMPED STORGAE PROJECT (2 x 250 MW)

1.0 INTRODUCTION

The existing Balimela irrigation project is a joint venture project of Odisha and Andhra Pradesh to divert half of the water to Potteruvagu sub-river basin for irrigation purposes in Odisha. While diverting the share of Odisha to Potteruvagu River 510MW (6X60MW+2X75MW) power is generated through a surface powerhouse by Odisha Hydro Electric Project (OHPC). The rest of the water is being discharged through Sileru River for utilization by Andhra Pradesh. The Balimela Power Project forms the second stage of development of Machkund - Sileru River, the first stage being the Machkund Project.

Preliminary studies and report submitted by THDC India Ltd (A Joint Venture of Govt. of India & Govt. of U.P.) proposing Balimela Pumped Storage scheme in the vicinity of the existing power plant of Balimela HEP near Balimela town.

The proposed Balimela Pumped Storage Project is located near existing Balimela Hydro Electric Project near Balimela village in Malkangiri tehsil, Malkangiri district, Odisha, India. The project falls in the area bounded by Lat. N 18° 13’ to 18° 11’ and Long. E 82° 05’ to 82° 06’**.** Balimela town is 37 km from the district head quarter Malkangiri. The Balimela reservoir which will be the Upper pool of the project is accessible with motor able road via SH 47 and the tail pool dam site is near to Balimela village.

2. PROJECT DESCRIPTION

The Scheme envisages construction of:

- Preliminary appraisal for construction of a 59.6m high and 699m long rockfill lower dam to provide a live storage of 6.811 MCM with Full Reservoir Level (FRL) at 255.68 m and Minimum Draw Down Level (MDDL) at 245.80 m.
- Selection and preliminary geotechnical and engineering appraisal of an underground power house with two numbers Francis type reversible pump-turbines of capacity 250 MW each along with all auxiliary system. Working out the tentative orientation of the powerhouse on preliminary geotechnical, engineering and hydraulic aspects.
- An underground Transformer Cavern with one number Power Transformer (three phase bank transformer of capacity 330 MVA) for each machine.
- Secondary Gas Insulated Switchyard shall be arranged in Transformer Cavern above the Transformers. These Transformers will be connected by bus duct galleries to machine hall.

- Preliminary geological, geotechnical and engineering appraisal of 1307m long Head Race Tunnel cum pressure shaft (steel lined) and 585m long Tail Race Tunnel (Concrete Lined) for conveyance of water.

- **Installed Capacity and Power Generation**

The details are summarized below:

Installed Capacity (MW)	500
No of units	2
Unit Size (MW)	250
Head (min) (m)	174.330
Rated Head (m)	179.323
Head (max) (m)	184.316
Hours of Peaking Operation	6
Annual Energy Generation (GWh)	1095
Annual Pumping Energy (GWh)	1303.57
Cycle Efficiency	84 %

- **Estimates of the Cost**

The breakup of the cost estimates for Option-I and Option-II is given below at January 2019 price levels:

Option: I - Considered all 2 machines are Fixed Speed Machines

Option: II- Considered 1 (One) machine are Variable Speed machine + 1 (One) machine are Fixed Speed Machine

Project Cost (Price Level January, 2019)		
Item	**Estimated Cost (Rs. Lakh)**	
	Option-I	**Option-II**
Civil Works	101118	102379
Electro-mechanical Works	98800	102158
IDC	36088	36840
Total	**236006**	**241377**

➢ Financial Aspects

The estimated cost of the Balimela Pumped Storage Scheme for Option-I and Option-II is Rs. **2360.06 Crore** and **2413.77 Crore** respectively and the annual energy generation will be of 1095 GWh. The project is scheduled to be completed by a period of 5 years 6 months.

i) Option-I (2 Fixed Units)

Sl. No.	Off Peak Energy Rate (Rs/kWh)	First Tariff (Rs/kWh)	Levelized Tariff (Rs/kWh)
1	1	6.65	6.12
2	2	7.88	7.35
3	3	9.11	8.58

ii) Option-II (1 Fixed + 1 Variable Unit)

Sl. No.	Off Peak Energy Rate (Rs/kWh)	First Tariff (Rs/kWh)	Levelized Tariff (Rs/kWh)
1	1	6.77	6.24
2	2	8.00	7.47
3	3	9.23	8.70