

Executive Summary – Case No 22 of 2022

1 Overview

This document intends to give overview of the Petition filed by the M/s. Sanjay B. Patil (SBP), (hereinafter referred to as “Petitioner”), before the Hon’ble Maharashtra Electricity Regulatory Commission (MERC) for Jambre Hydro Electric Project (JHEP) (1 x 2 MW) located at Jambre dam, near Jambre village Tal. Chandgad, Dist. Kolhapur.

Water Resources Department, Government of Maharashtra (GOMWRD) declared its policy for development of small hydro projects through private sector participation in 2005. As per this prevailing policy, GOMWRD selected M/s Sanjay B Patil, for development of Jambre HEP of capacity of 2 MW and awarded the Letter of Permission dated July 9, 2007.

GOMWRD, after ascertaining that the scheme is capable of harnessing optimally the hydro power potential available at site consistent with scheme, allotted the Project to M/s Sanjay B Patil by issuing the Letter of Allotment (LOA) vide dated 6 June, 2009 and Hydro Power Development Agreement (HPDA) was signed on 15 May 2012 for 30 years.

The power generated, during the life of the powerplant is proposed to be sold to the Distribution Licensee (MSEDCL). Hence, the Petitioner has approached this Hon’ble Commission to seek determination of Project specific tariff for its Project, for sale of electricity generated to the Distribution Licensee MSEDCL.

The said petition has been filed as per Regulation 9.1 (c), 10.2 of MERC RE Tariff Regulations, 2019, Section 62 (1)(a) and 86(1)(e) of the Electricity Act, 2003.

2 Project Details

Jambre HEP is located at the toe of Jambre Dam, which is constructed across the Tamraparni River. The project is located near Jambre village in Chandgad taluka of Kolhapur District. An irrigation outlet is proposed at Ch. 480 m on the left flank. Initially the water, as per the irrigation requirement is proposed to be let down into the river through a head regulator. The gross storage is 23.230 Mcum. The total irrigable area proposed is 4.72 Th ha with gross annual utilization of 26.92 Mcum. Power is proposed to be generated from the releases intended for irrigation, from the reservoir into the river, utilizing the same at variable head.

The irrigation cum power outlet intake arrangements like trash racks, steel penstock stop log gate etc has been provided. The steel penstock is 2.80 meter diameter to carry the

design discharge of 10.20 cumecs. On the downstream side of the dam of 'Y' piece is provided to this irrigation cum power outlet, along with a diffuser type valve, so that water can be either diverted to the power house or let into the river directly whenever the power house is required to be closed. To utilize the Irrigation, Non-irrigation releases and spills for power generation, there is potential of 1 x 2.0 MW capacity of the plant.

3 Installed Capacity & Design Generation:

On the basis of annual inflow, annual utilization and month wise releases etc, the 75% dependable yield at the dam site is 70.19 mcum and annual utilisation is 26.92 mcum. The inflow being more than live storage capacity of dam spill water will be available for number of months per year which can be utilised for power generation.

The 75% dependable working table shows the available power generation ranging from 1305 KW to 2175 KW. **An optimum installation of 2000 KW therefore has been proposed. With this installation, the annual energy generation works out to 4.32 Mus.** The horizontal Francis turbine is proposed to cover the above range or head variation.

4 Status of the Project

The Present status of the Project is outlined in the following table:

Work	Status
Jambre Dam	<ul style="list-style-type: none"> Construction of the Jambre dam is completed in 2017-18 An Irrigation Dam is constructed across the river near village Jambre, Taluka Chandgad; Dist. Kolhapur and impounds 23.23 million cubic meters of water.
Civil work	<ul style="list-style-type: none"> Power House, Penstock, Rising Apron, TRC, OD Switchyard & Superstructure work is completed
E&M Work	<ul style="list-style-type: none"> All material of E&M including Turbine, generator, panels, allied controlling equipments, ODY equipments of Jambre HEP is installed, inspected and ready to commission
33kv Line & Bay Work	<ul style="list-style-type: none"> Entire work related to Line and Bay is completed. Work Completion Report (WCR) work is under progress and likely to be completed shortly. Permission to Charge line and bay from MSEDCL is received.

Work	Status
Connectivity and Evacuation Arrangement	<ul style="list-style-type: none"> As per TEFR, the evacuation of power has been envisaged by 33 kV line from nearest sub-station about 19 km from the project site. MSEDCL approved the grid connectivity for the project through 33 kV Single Circuit line from 33/11 kV Chandgad Substation, which is approx. 20 km from the project site. Permission to synchronized machine with Grid from MSETCL is pending
Power Supply Arrangement	<ul style="list-style-type: none"> Power Purchase Agreement (PPA) dated 29 March, 2017 for sale of 2 MW power from Jambre HEP is signed with MSEDCL as per tariff determined by the Hon'ble Commission.

5 Capital Cost

The Petitioner have claimed the estimated capital cost in accordance with the Regulation 14 and 31 of MERC RE Tariff Regulations 2019. The Petitioner have claimed the capital cost in accordance with the above said provision including the cost towards evacuation infrastructure. The COD is anticipated in next three months based on the present status of the project and hence capital cost submitted in the instant Petition is estimated capital cost as on COD of the project. Moreover, the actual capital expenditure incurred till 30 November, 2021, duly certified by Auditor has also been submitted in the instant Petition. The sub-head wise cost details are as under:

Sl. No.	Parameters	CAPEX as on 30 November, 2021 (Rs. Lakh)	Estimated CAPEX at CoD (Rs. Lakh)
1.	Preliminary Work, Government fees and premium and other works	206.62	222.04
2.	Civil Works	316.54	432.27
3.	Hard Cost	558.11	569.92
4.	Overhead and Establishment Works	27.08	27.90
5.	Evacuation Works	222.80	310.90
6.	IDC	409.98	458.53
7.	Grand Total	1741.42	2021.55

The Petitioner submits that there has been escalation in cost as compared to projection made at the time of preparation of DPR, the reasons for the same is as highlighted below:

1. Preliminary works

- Expenses includes the Upfront premium of Rs. 30.51 Lacs/MW and threshold premium of Rs. 100 Lacs/MW paid to GoMWRD ;
- Other expenses incurred related to government fees in relation to stamp duty, registration fee, Grid Connectivity Charges, MEDA clearance, etc

2. Civil works: (Competitive bidding was carried out)

- During the execution of the project, due to very hard rock available at shallow depth at location of power house, penstock and raising apron with some part of tail race channel, it was required to be cut by using diamond rope cutting machine instead of chiseling.
- As blasting was not permitted, the cutting of rock being a time consuming process, took more than six months to achieve required depth.
- The difference of increase of rate of diamond cutting excavation is 61% than chiseling by mechanical equipment leading to increase in cost.

3. Cost towards Evacuation Works

- At the time of preparation of estimation, the evacuation of power has been envisaged by 33 kV line from nearest sub-station, which is about 12 km from the project site which on actual increased to 20 km resulting in higher cost.
- The Petitioner had to face ROW issues for laying transmission line due to resistance from local public.
- Also 40% of the line was passing through farmland wherein work was not allowed to be done during peak agricultural season.
- If the line would have diverted along the road length, it would have resulted in increase the line length of transmission line thereby increasing evacuation cost.

4. Interest During Construction (IDC)

- The rate of interest considered for the term loan is 12.50% only for the quantum of loan availed and IDC is not calculated on the balance debt funded by Equity.
- The IDC claimed in the Petition is in line with the interest paid to the Bank during the stage of construction based on the drawal of the amount to carry out the construction activity.

5. Summary of Delay

- Issue related to hard rock at shallow depth requiring diamond rock cutting machine as blasting was not permitted
- ROW issues for laying transmission line due to resistance from local public and also 40% of the line passing through farmland wherein work was not allowed

to be done during peak agricultural season. If the line would have diverted along the road length, it would have resulted in increase the line length of transmission line thereby increasing evacuation cost.

- Due to Covid-19 pandemic overall work was slowed down since March 20 due to lockdown and restrictions imposed by the State Government from time to time.

6 Benchmark of Capital Cost

In the past orders, it has been observed that approach of benchmarking of capital cost has been adopted by the Hon'ble Commission. Though the available benchmark for SHP are for new projects and not for R&M project, the same is outlined as under:

- Hon'ble Commission, in Generic Tariff Order dated 30 April, 2019 has approved the capital cost as Rs. 636.01 Crore per MW for less than 5 MW and more than 1 MW to be commissioned in FY 2019-20. This capital cost approved was based on the norms specified for 2015 and derived based on indexation formula applied on actual cost data for period between FY 2010-11 to FY 2014-15.
- For recently commissioned small hydro project having capacity less than 5 MW, IREDA submitted the capital cost as Rs. 12.57 Crore per MW for States like HP, Uttarakhand, West Bengal and North Eastern States) and Rs. 8.90 Crore per MW Other remaining States.
- The cost is comparable to the break-up cost component wise provided by Hon'ble CERC in Explanatory Memorandum to draft CERC RE Tariff Regulations, 2020 which is around Rs. 11.18 Crs/MW.
- As per National Mission on Small Hydro issue by MNRE, the cost in FY 2015, per megawatt of small hydro projects is poignant at about Rs. 8.50 crore to Rs. 9.50 crore per megawatt (MW). Considering the median of Rs. 9 Crore per MW envisaged in FY 2015, actual cost incurred by the Petitioner is ~Rs. 10.1 Crs per MW, resulting in an escalation of around 3.15% per year which is comparatively lower than the inflation of the country witnessed in last 5 years.
- The Hon'ble Commission in its Order dated 26 March 2021 in Case No 208 of 2020 has approved the Capital Cost of 1049.25 Lakh per MW.

7 Determination of Project Specific Tariff

In line with Regulations 9.1 (c) of prevailing MERC RE Tariff Regulations, 2019, this petition has been filed for determination of Project specific tariff and has proposed a

single part tariff as per Regulations 11 of prevailing MERC RE Tariff Regulations, 2019. The performance parameters and financial parameters adopted to determine the tariff are highlighted in the following table:

Parameter	Units	Amount	Rationale
Installed Capacity	MW	2	Irrigation-cum-power Project
Useful Life of Assets	Years	35	<ul style="list-style-type: none"> Proposed 35 years as per MERC RE Tariff Regulations, 2019.
Tariff Period	Years	25	<ul style="list-style-type: none"> GOMWRD has signed HPDA with the Petitioner for 30 years only and hence requested to Hon'ble Commission to consider as 30 years as per HPDA.
Capacity Utilisation Factor	%	30%	As per Regulations 32 of MERC RE Tariff Regulations 2019
Auxiliary Consumption	%	1%	As per Regulations 33 of MERC RE Tariff Regulations 2019
Capital Cost	Rs. Lacs	2,021.55	Estimated Capital Cost
Capital Subsidy	Rs. Lacs	-	As per prevailing policy framework, capital subsidy is not applicable to Jambre HEP.
Debt:Equity	%	70:30	<ul style="list-style-type: none"> Availed debt of Rs 9 Crore and balance amount is funded through equity. Since the Equity portion is on a higher side and for computation of tariff, 70:30 Debt: Equity Ratio considered as per Regulations 15 of MERC RE Tariff Regulations, 2019.
Loan Tenure	Year	12	As per Regulations 16.1 of MERC RE Tariff Regulations, 2019
Loan Interest	%	11.25%	<ul style="list-style-type: none"> Actual interest rate of 12.50% considered for actual debt of Rs. 9 Crs Balance debt funded by Equity, Average of the one-year SBI MCLR plus 200 basis points i.e. 9.07% as per Regulations 16.2 (c) of MERC RE Tariff Regulations, 2019.
Depreciation	%	5.83% & 2.31%	As per Regulations 17.2 and 17.3 of MERC RE Tariff Regulations, 2019. First 12 year – 5.83% and remaining useful life – 0.87%

Parameter	Units	Amount	Rationale
Return on Equity	%	18.71%	As per Regulations 18.2 of MERC RE Tariff Regulations, 2019. RoE @14% is grossed with Corporate rate of 25.168%
Operation and Maintenance Exp.	% of Capex	3.60%	As per Regulations 34 of MERC RE Tariff Regulations.
Escalation on O&M	%	2.28%	As per MERC RE Tariff Regulations.
Rate of Interest on Working Capital	%	8.57%	As per Regulations 19 of MERC RE Tariff Regulations, 2019 equivalent to SBI 1 year MCLR + 150 basis points
Normative Interest on Working Capital			As per Regulations 19.1 of MERC RE Tariff Regulations, 2019
Discounting Factor	%	10.09%	As per Regulations 12.1 of MERC RE Tariff Regulations, 2019
Water Cess and Charges for maintenance of Intake Structure, Penstock etc		5 paise per unit with escalation of 5%	As per HPDA
Land Lease Rent		Rs. 1/- per kW per annum with escalation of 5%	As per HPDA

8 Proposed Tariff

The Petitioner has calculated the levelized project specific tariff for Jambre HEP at Rs. 7.03/kWh for the period of 35 years.

In addition, the Petitioner, as specified in the Regulations has prayed for reimbursement of expenses from MSEDCL on Electricity Duty, Water Royalty, Land Lease & Maintenance Charges, which are payable to the GOMWRD as per the relevant provisions in the HPDA, and not considered in the calculation of tariff, on the basis of actual cost incurred,

9 Legal and Statutory provisions

- Section 62(1) of the Electricity Act 2003 (hereinafter referred as “the Act”) mandates the Hon’ble Commission to determine the tariff for supply of electricity by a generating company to the distribution licensee.
- Section 86 (1) (e) of the Act mandates Hon’ble Commission to promote the generation of electricity from renewable sources of energy.
- National Electricity Policy and National Tariff Policy promotes the generation of the electricity through hydro generation as well as renewable energy sources.
- Section 61 (h) of the Act also stipulate that, while determining such tariff, the Hon’ble Commission shall be guided by the terms and conditions for tariff determination framed there under.
- Hon’ble Commission notified Maharashtra Electricity Regulatory Commission (Terms and Conditions for Determination of Renewable Energy Tariff) Regulations, 2019
- Jambre HEP forms eligibility of Mini Hydro Power Project as specified in Regulation 2.1(n) (ii) of MERC RE Tariff Regulations, 2019.
- As per Regulation 9 of MERC RE Tariff Regulations, 2019, only the project specific tariff shall be determined the Hon’ble Commission on case to case basis for Small Hydro Projects.
- **Accordingly, the instant Petition has been filed for determination of the Project Specific Tariff for Jambre Hydro Electric Project of capacity 2 MW, as per Regulation 9.1 (c), 10.2 of MERC RE Tariff Regulations, 2019, Section 62 (1)(a) and 86(1)(e) of the Act.**

10 Additional Prayers

- **Issue of Metering Point** – The metering location has been changed from generation end to substation end which is completely contrary to the PPA signed between the parties, where in Interconnection Point is defined to be the line isolator on outgoing feeder in HV side of generator transformer. In view of the same, the Petitioner requests the Commission to direct MSEDCL to allow placing the meter at the generation end instead of substation end.
- **Additional Capitalisation** - HPDA signed with the GoMWRD and EPA signed with the Distribution licensee will be for the period of 35 years and therefore for such larger period, certain additional Capitalisation in relation to overhauling,

maintenance of the plant and machinery etc would be required to be undertaken which cannot be envisaged at present. The Petitioner requests the Hon'ble Commission to allow Petitioner to approach the Hon'ble Commission with proposal of such additional capital expenditure to be incurred and the methodology for recovery of these expenditure during tariff period.