

Annexure-1

Annual Report on Technical Performance of Chibro HEP

1.1 Overview

1.1.1 The petitioner in compliance of the relevant Regulations of UERC (Terms and Conditions for determination of Tariff) Regulations, 2011 & UERC (Terms and Conditions for determination of Multi Year Tariff) Regulations, 2015 is providing information with regard to the operational performance related to technical parameters of Chibro Hydro Power Station.

1.1.2 The operational parameters considered are:

- (a) Gross generation
- (b) AUX (Auxiliary consumption and Transformation losses)
- (c) Plant Availability factor (PAF)

1.1.3 The information provided in this chapter relates to operational performance:

- Actual in FY 2013-14, 2014-15, 2015-16, 2016-17, 2017-18 (up to 30.09.2017)
- Expected in FY 2017-18 & 2018-19.

1.2 Power Station Description

1.2.1 Chibro Hydro Power Station with an installed capacity of 240 MW (4x60 MW) is a run of river scheme constructed on river Tons, a major tributary of river Yamuna and is situated in District Dehradun of Uttarakhand state. The scheme consists of a 39 m high concrete diversion dam at Ichari. The river inflows are diverted through intake structure into a concrete lined head race tunnel of 6.22 km long and 7 m dia. The head race tunnel ends at the 92 m high and 20m dia. surge shaft, where the water is fed through 123 m long 3.8 m dia. 4 nos. underground steel lined penstocks to all the four machines installed in Chibro underground Power Station.

1.2.2 There are four generating units having vertical Francis turbine directly coupled with synchronous generator. The turbine output is 63 MW for a rated net head of 110 m. The generators are designed for a nominal output of 63 MVA with lagging power factor of 0.9 and class "F" insulation.

1.2.3 This Power Station was commissioned in the year 1975. Due to operations of machines for past 42 years in silt laden water, efficiency of machines has substantially decreased and availability of machines has been adversely affected in spite of regular and timely maintenance.

1.2.4 Though this Power Station has an installed capacity of 4x60 MW but due to discharge limitations of 200 cumecs in HRT, maximum generating capacity is restricted to 185 MW.

1.2.5 Salient features of Chibro Hydro Power Stations are provided in form F 2.3 of this petition.

1.3 Energy Generation

1.3.1 Actual/Expected/Projected energy generation in FY 2013-14, FY 2014-15, FY 2015-16, FY 2016-17, FY 2017-18 & FY 2018-19 is given in the table below:

Table -1: Actual, Expected & Projected Energy

Particulars	Norms	2013-14 (A)	2014-15 (A)	2015-16 (A)	2016-17 (A)	2017-18 (E)	2018-19 (P)
Design Energy/ Actual Generation (MU)	750.00	949.79	871.44	814.79	713.63	815.91	830.55
Auxiliary Cons. (%)	0.7%	1.37%	1.38%	1.29%	0.97%	0.84%	.83%
Transformation/ other losses and consumption (%)	0.5% (Tr. losses)						
Net Saleable Energy (MU)	741.00	936.77	859.64	804.28	706.70	809.04	823.62

A- Actual, E-Expected, P-Projected

1.3.2 From the above table it is evident that gross generation has been little less than the design energy in FY 2016-17 due to reduced discharge in river Tons

and the expected energy in FY 2017-18 is expected to be more than the previous two years. The projected energy for FY2018-19 is 830.55 MU.

1.3.3 The AUX (auxiliary consumption and transformation losses) has been lower than the normative in FY 2016-17 and also expected to be within norms in FY 2017-18 & FY 2018-19.

1.4 Plant Availability Factor

1.4.1 The recovery of the Annual Fixed Charges is dependent on the Plant Availability achieved by the Power Station. The principle for recovery of fixed charges on the basis of the availability achieved by the plant has been introduced by the Hon'ble Commission by its regulations UERC (Terms and Conditions for determination of tariff) Regulations, 2011 & 2015. The petitioner has started computing this factor as per the provisions of the above regulations from FY2013-14.

Table 2: Plant Availability Factor

Particulars	Norms	2013-14 (A)	2014-15 (A)	2015-16 (A)	2016-17 (A)	2017-18 (E)	2018-19 (P)
NAPAF / PAFM (%)	65.06, 65.06	65.83	68.19	71.30	66.75	67.11	67.11
	65.06						
Planned Outages (Hrs)	NA	8140	9019	5460	5934	5040	2424
Forced Outages (Hrs)	NA	2251	436	195	208	98	167

1.4.2 PAFM: The Chibro Power Station is likely to achieve the normative plant availability factor for the FY 2017-18 & FY 2018-19.

The PAFM fixed by Hon'ble UERC during FY 2013-14, 2014-15, 2015-16 & FY 2016-17 could be achieved through optimum availability of water in the river and performance of Ichari dam and no major problems faced in the machines resulting in better availability of machines. **The Petitioner does not seek any**

deviation in NAPAF for the FY 2017-18 & 2018-19 from the norms as determined by Hon'ble Commission in its order.

Table 3: Actual & Expected PAFM (%)

Sl.No.	Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Average
1	2013-14	47.66	58.95	64.95	69.45	77.00	77.42	76.18	64.38	60.40	62.85	65.37	65.37	65.83
2	2014-15	65.44	67.75	68.38	75.87	78.56	74.46	73.73	78.02	65.84	55.78	46.39	68.09	68.19
3	2015-16	60.94	69.52	69.59	77.00	77.54	77.74	77.20	76.89	70.13	69.86	72.78	56.46	71.30
4	2016-17	66.63	69.59	71.83	75.33	75.16	78.44	78.02	71.27	66.18	45.98	46.39	56.12	66.75
5	2017-18	51.39	68.75	69.03	74.77	72.65	76.25	76.28	72.64	65.64	58.62	57.73	61.51	67.11
6	2018-19	51.39	68.75	69.03	74.77	72.65	76.25	76.28	72.64	65.64	58.62	57.73	61.51	67.11

1.4.3 Planned Outages: Planned outages on account of annual/capital maintenance in FY 2018-19 are given below. The Petitioner shall continue to lay emphasis on preventive and planned maintenance of machines for the year 2017-18 and onwards too for better power station availability.

Table 4: Planned Outages

AM- Annual Maintenance, CM-Capital Maintenance

FY	Unit	From	To	No. Of Day	Outage Type
2018-19	Unit 1	30-01-2019	23-02-2019	25	AM
	Unit 2	01-11-2018	25-11-2018	25	AM
	Unit 3	31-12-2018	24-01-2019	25	AM
	Unit 4	02-12-2018	27-12-2018	26	AM



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