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, 2015 & UERC (Terms and Conditions for determination of Multi Year Tariff) Regulations, 2018 is providing information with regard to the operational performance related to technical parameters of Chibro Hydro Power Station.

The operational parameters considered are:

(a) Gross generation

(b) AUX (Auxiliary consumption and Transformation losses)

(c) Plant Availability factor (PAF)

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

- Actual in FY 2016-17, 2017-18, 2018-19 (up to 30.09.2018)
- Expected in FY 2018-19 & projected for the control period 2019-20 to 2021-22.

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.

(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

DGM (Tech.)
UJVN Ltd.

1.2.3 This Power Station was commissioned in the year 1975. Due to operations of machines for past 43 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 2016-17, FY 2017-18, FY 2018-19 & for the control period from FY 2019-20 to FY 2021-22 is given in the table below:

Table 1: Actual, Expected & Projected Energy

Particulars	Norms	2016-17 (A)	2017-18 (A)	2018-19 (E)	2019-20 (P)	2020-21 (P)	2021-22 (P)
Design Energy/ Actual Generation (MU)	750	714.00	784.87	806.50	780.00	780.00	780.00
Auxiliary Cons. (%)	0.70%	0.97%	0.75%	1.05%	1.20%	1.20%	1.20%
Transformation/ other losses and consumption (%)	0.50%						
Net Saleable Energy (MU)	741	707.07	779.02	801.25	770.64	770.64	770.64

A- Actual, E-Expected, P-Projected

1.3.2 From the above table it is evident that gross generation was more than the design energy of the plant in FY 2017-18 and same is expected for FY 2018-19 & for the control period from 2019-20 to 2021-22.

1.3.3 The AUX (auxiliary consumption and transformation losses) has been lower than the normative in FY 2017-18 and also expected to be within norms in the FY 2018-19 & for the control period of FY 2019-20 to FY 2021-22.

DGM (Tech.)
UJVN Ltd.

(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

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, 2015 & 2018. The petitioner has provided this factor as per the provisions of the above regulations.

Table 2: Plant Availability Factor

Particulars	Norms	2016-17 (A)	2017-18 (A)	2018-19 (E)	2019-20 (P)	2020-21 (P)	2021-22 (P)
NAPAF/PAFM (%)	65.06%	66.75%	64.95%	63.44%	63.00%	63.00%	63.00%
	65.06%						
Planned Outages (Hrs.)	NA	5,934	5,825	2,976	2,400	1,992	1,920
Forced Outages (Hrs.)	NA	208	186	197	192	194	193

1.4.2 **PAFM:** The Chibro Power Station is very old HEP & requires more maintenance hence, has to be shut down for longer periods to carry out maintenance. **The Petitioner requests the Hon'ble Commission to kindly consider and approve the NAPAF of Chibro HEP for the third control period i.e. from FY 2019-20 to FY 2021-22 as tabulated here above.**

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	76.21	68.13	70.36	60.62	45.83	45.43	64.95
6	2018-19	45.83	45.83	64.86	63.19	82.61	80.56	71.74	66.58	59.02	55.35	58.29	67.40	63.44

1.4.3 **Planned Outages:** Planned outages on account of annual/capital maintenance in the control period FY 2019-20 to FY 2021-22 are given below. The Petitioner shall continue to lay emphasis on preventive and planned maintenance of machines for the year 2018-19 onwards for better power station availability.

(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun

DGM (Tech.)
UJVN Ltd.

Table 4: Planned Outages

FY	Unit No.	Date of Start	Date of Completion	No of Days	Remarks
2019-20	Unit 1	15-11-2019	05-12-2019	20	AM
	Unit 2	11-12-2019	31-12-2019	20	AM
	Unit 3	08-04-2019	28-04-2019	20	AM
		08-01-2020	28-01-2020	20	AM
	Unit 4	05-02-2020	25-02-2020	20	AM
2020-21	Unit 1	15-11-2020	05-12-2020	20	AM
	Unit 2	15-12-2020	04-01-2021	20	AM
	Unit 3	15-01-2021	04-02-2021	20	AM
	Unit 4	15-01-2021	07-02-2021	23	AM
2021-22	Unit 1	15-11-2021	05-12-2021	20	AM
	Unit 2	15-12-2021	04-01-2022	20	AM
	Unit 3	15-01-2022	04-02-2022	20	AM
	Unit 4	15-02-2022	07-03-2022	20	AM

AM- Annual Maintenance, CM-Capital Maintenance

DGM (Tech.)
UJVN Ltd.

(Purushottam Singh)
Director (Operation)
UJVN Ltd.
Dehradun