

Annexure-1

Annual Report on Technical Performance of Tiloth 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 Tiloth 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 (upto 30.09.2017)
- Expected in FY 2017-18 & 2018-19.

1.2 Power Station Description

1.2.1 Tiloth Hydro Power Station with an installed capacity of 90 MW (3x30 MW) is a run of river with pondage scheme constructed on river Bhagirathi, a major tributary of river Ganga and situated in District Uttarkashi of Uttarakhand state. The scheme consists of a 39 m high concrete diversion dam. The river inflows are diverted through intake structure with sedimentation basin into a concrete lined head race tunnel of 6.5 km long and 6 m dia. The head race tunnel ends at the 69 m high and 11m dia. surge shaft, where the water is fed through 415 m long 3.8/2.5 m dia. underground penstocks which was trifurcated to feed all the three machines installed in the Power Station.

1.2.2 There are three generating units having vertical Francis turbine directly coupled with synchronous generator. The turbine output is 31.6 MW for a rated net head of 145 m. The generators are designed for a nominal output of 34 MVA with lagging power factor of 0.9 and class "B" insulation

1.2.3 This Power Station was commissioned in the year 1984. Due to continuous operation of machines for the past 31 years in silt laden water, efficiency of machines has substantially decreased and availability of machines has been adversely affected in spite of regular & timely maintenance.

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	2014-15	2015-16	2016-17	2017-18	2018-19
		(A)	(A)	(A)	(A)	(E)	(P)
Design Energy/ Actual Generation (MU)	395.00	382.18	380.548	484.33	349.63	381.53	435.00
Auxiliary Cons. (%)	0.2%	1.42%	1.82%	0.97%	2.14%	1.60%	1.72%
Transformation losses (%)	0.5 %						
Net Saleable Energy (MU)	391.05	377.04	373.627	479.63	342.15	375.43	427.52

1.3.2 The auxiliary and transformation losses in FY 2016-17 were more than the normative level and also expected to be more than normative level in FY 2017-18 due to less generation from the Power Station and continued repair work of underwater parts. In FY 2018-19, the AUX is expected to be more than normative level.

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 from the FY 2013-14. The petitioner has started

computing this factor as per the provisions of the above regulations from FY 2013-14.

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 (%)	79	64.66	62.50	74.06	59.72	64.60	64.60
	79						
Planned Outages (Hrs)	NA	3048	5390	4763	7658	7935	15000
Forced Outages (Hrs)	NA	1714	393	1435	2248	678	-

1.4.2 PAFM:

A. FY 2016-17:

Power station is suffering from excessive silt & aging. Breakdown of the equipment & closure of the Power Station increased unprecedentedly even with the best possible maintenance efforts in FY 2016-17. Major closure & Forced outages are as hereunder:

- There was a forced closure of the Power station w.e.f 25-04-2016 to 30-04-2016 due to very urgent work in cooling water system (Strainer valves of the units were replaced) & MIV bypass valve of Unit 2 was repaired.
- Unit-2 had been in Forced Outage from 19/07/2016 to 26/07/2016, and 30/07/17 to 31/07/17 due to excess water leakage from top cover.
- Power Station has been under monsoon closure from 07-08-2016 to 10-09-2016 for interim repair of underwater parts.
- Unit-2 had been in Forced Outage from 01-05-2016 to 19-06-2016 due to fault in stator winding.

- Unit -1 had been under outage for reverse engineering works for RMU from 13/02/17 to 14/07/17

The NAPAF of the Maneri Bhali-I Power Station is determined as 79% by the Hon'ble Commission for the second control period where as petitioner has achieved 59.72 % PAFM in FY 2016-17 due to reasons mentioned above. It is self-explanatory that mentioned breakdowns and closers of power station were beyond the control of petitioner. **Therefore, Petitioner requests Hon'ble commission to approve the NAPAF of the Power Station as 59.72% (actual achieve PAFAM) for FY 2016-17.**

B. FY 2017-18:

Major closure & Forced outages in the FY 2017-18 (till 30/07/17) are as hereunder:

- Unit -1 had been under outage for reverse engineering works for RMU from 13/02/17 to 14/07/17.
- Unit-3 had been in Forced Outage from 01/07/2017 to 04/07/2017 due to heavy water leakage from penstock drain valve.
- Power Station has been under monsoon closure from 24-07-2017 to 23-08-2017 for interim repair of underwater parts.

The PAFM for 2017-18 is expected to be 64.60% with best possible operation & maintenance efforts. However, till September 2017 Power Station achieved 56.97% PAFM due to reasons mentioned above. It is self-explanatory that mentioned breakdowns and closers of power station were beyond the control of petitioner. **Therefore, Petitioner requests Hon'ble commission to approve the NAPAF of the Power Station as 64.60% (expected maximum possible achievable PAFAM) for FY 2017-18 and for FY 2018-19.**

Table 3: Actual & Expected PAFM (%)

Actual PAF from 2013-14 to Sept. 2016-17 and anticipated from October 2016 to March 2019														
Sl.No.	Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Average
1	2013-14	42.33	97.56	49.79	0.00	85.80	88.73	80.17	72.21	62.26	67.14	67.14	62.81	64.66
2	2014-15	67.14	90.67	99.59	79.59	7.58	83.21	65.69	63.03	3.97	50.53	67.94	71.11	62.50
3	2015-16	86.16	100.42	97.35	86.34	34.65	71.61	83.38	66.76	67.14	64.97	67.14	62.81	74.06
4	2016-17	61.54	66.05	78.33	38.98	7.58	45.88	100.70	99.59	72.55	63.89	47.95	33.57	59.72
5	2017-18	54.44	66.67	66.67	24.73	33.19	96.11	100.00	66.67	66.67	66.67	66.67	66.67	64.60
6	2018-19	54.44	66.67	66.67	24.73	33.19	96.11	100.00	66.67	66.67	66.67	66.67	66.67	64.60

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

FY 2018-19 (Proposed)				
Unit 1	16-07-2018	25-08-2018	41	Monsoon closure
	01-01-2019	31-12-2019	365	RMU
Unit 2	16-07-2018	25-08-2018	41	Monsoon closure
	16-11-2017	14-02-2018	91	Major over hauling
Unit 3	16-07-2018	25-08-2018	41	Monsoon closure
	15-11-2018	30-12-2018	46	Under water parts maintenance


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