ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
PLOT NO. 4, CHUNUKOLI,
SHAILASHREE VIHAR, BHUBANESWAR-751021
****

Present: Shri U. N. Behera, Chairperson
Shri S. K. Parhi, Member

Case No. 52/2019

OHPC Ltd.	……	Petitioner
Vrs.		
GRIDCO Ltd. & others	….....	Respondents

In the matter of: **Application for approval of NAPAF of Hydro Power Stations under OHPC for the control period from 01.04.2019 to 31.03.2024 as per para No. 122 of the Tariff Order of OHPC for FY 2019-20.**

For Petitioner: Sri Gyanaranjan Das, CGM, OHPC Ltd.
Sri Dharmendra Nath Patra, DGM, OHPC Ltd.

For Respondent: Sri S S Nayak, CGM(PP), GRIDCO Ltd.
Sri R P Mohapatra

ORDER

Date of hearing: 14.01.2020 **Date of order:20.03.2020**

The Odisha Hydro Power Corporation Limited (OHPC) a Generating Company has filed this petition for approval of Normative Annual Plant Availability Factor (NAPAF) of different power generating units under its control.

OERC (Terms and Conditions for determination of generation tariff) Regulations, 2014 at para No. 5.4 has stipulated as follows:

"*The norms of operation as given hereunder shall apply to hydro generating stations:*

(a) Normative annual plant availability factor (NAPAF) for hydro generating stations:

(i) Xxxxxxxxx

(vii) The normative annual plant availability factor (NAPAF) for existing Hydro Generating Stations of OHPC Ltd. will be as determined by Commission from time to time.

2. The Commission at para No.122 of the Tariff Order of OHPC for FY 2019-20 had observed as follows:

"In accordance to para 5.4(vii) of OERC (Generation) Regulation 2014 Commission has to determine the NAPAF of OHPC power stations for next block period i.e. from 01.04.2019 to 31.03.2024. For determination of NAPAF, OHPC is required to submit the details of renovation works carried out along with their time period of completion so as

to find the availability of machines accurately during last five years. Since OHPC has not submitted the detailed machine-wise availability of its plants, the Commission has decided to fix NAPAF of OHPC plants provisionally as that of last block period."

Accordingly OHPC has resubmitted the application for approval of NAPAF of different power stations of OHPC for the block period FY 2019-20 to FY 2023-24.

3. The Hydro power plants of OHPC which have outlived the useful life of 35 years/ on the verge of completion of useful life are always prone to frequent trouble. These old machines go on frequent outage in spite of availing periodic maintenance. Frequent outage due to ageing of machine parts, obsolete critical spares, and due to non-availability of spares reduces the machine availability during the years thereby reducing the plant availability factor below the normative level.

Further the declared capacity of the low head hydro station having storage and pondage type reservoir reduces with the reduction in reservoir level. The plant availability factor reduces considerably during the period of hydrology failure as declared capacity remains low due to low Reservoir Level (RL). Delayed rainfall or inconsistent rain fall results in reduction of declared capacity.

As per OERC Generation Tariff Regulation, 2014, the capacity charge (inclusive of incentive) payable to a hydro generating station for a calendar month shall be

AFC x 0.5 x NDM /NDY x (PAFM/NAPAF) (in Rupees)

Where,

AFC – Annual fixed cost specified for the year, in Rupees.

NAPAF – Normative Plant Availability Factor in percentage

NDM – Number of days in the month

NDY – Number of days in the year

PAFM – Plant availability factor achieved during the month, in percentage

OHPC submits that fixation of NAPAF of power stations should not be fixed solely upon design parameters. It may lead to a dent on the capacity of OHPC to recover the NAPAF and the ARR. Therefore the performance data of OHPC power stations of previous years should form a basis for determination of NAPAF. OHPC has three operating high head power stations namely, Upper Indravati, Upper Kolab and Balimela and three low head power stations namely Rengali, Hirakud and Chiplima Hydro Electric Project.

The actual PAFM of OHPC power stations for the block period 2014-15 to 2018-2019 is presented in the table below:

Table-1
Actual PAFM of the Power Stations

Sl. No.	Name of the Power Stations	2014-15	2015-16	2016-17	2017-18	2018-19	Average of 5 years
1	RHEP	85.00	85.78	85.69	72.02	80.85	81.87
2	UKHEP	92.56	92.48	83.11	65.06	73.19	81.28
3	BHEP	75.38	74.58	86.56	81.96	87.75	81.25
4	HHEP	65.21	79.25	73.99	69.01	36.42	64.77
5	CHEP	61.47	75.03	88.53	58.31	54.68	67.60
6	UIHEP	94.28	95.99	83.96	94.65	86.42	91.06

The average plant availability of OHPC power stations from FY 2014-15 to FY 2018-19 vrs. the NAPAF fixed by the Commission is given in the table below:

Table-2

Particulars	RHEP	UKHEP	BHEP	HHEP	CHEP	UIHEP
Average plant availability for last 5 years	81.87	81.28	81.25	64.77	67.60	91.06
NAPAF approved in last block period	75	87	83	78	75	88
% of achievement of NAPAF in last five years	80% (4 years out of 5 years)	40% (2 years out of 5 years)	40% (2 years out of 5 years)	20% (1 year out of 5 years)	40% (2 years out of 5 years)	60% (3 years out of 5 years)
NAPAF proposed	75	80	80	64	65	85

As revealed from the table above, OHPC has submitted that the power stations are not in a position to recover their annual capacity charges every year due to higher NAPAF target fixed by the Commission. It is seen that RHEP has achieved the NAPAF for 4 years out of 5 years of the last block period, UIHEP has achieved the NAPAF for 3 years and BHEP, UKHEP and CHEP have achieved for two years only in the last block period. HHEP has achieved only once during the last block period.

In order to fix the NAPAF of OHPC stations for the next block period the actual availability of power stations in the last 5 years shall be considered as bench mark for OHPC and necessary relaxation may be given in fixing the NAPAF for optimum recovery of capacity charges.

In order to meet the instant grid requirements, frequent start/stop, rapid ramp up/ramp down and generation as well as absorption of VAR etc. are imposed on the above

generating units as per the instruction of SLDC. The above operational aspects are detrimental to the health of the above old machines and lead to frequent forced outages thereby resulting low plant availability factor achievement and consequential loss in capacity charges.

Besides some project specific constraints are faced by different power stations of OHPC. For example the units going under R&M as per approval of the Commission result in the unavailability of those units for operation leading to achievement of low NAPAF. Therefore, OHPC has submitted that looking into actual performance of OHPC power stations in achieving NAPAF, the revised NAPAF for the next block period i.e. FY 2019-20 to 2023-24 may be fixed as under:

Table-3

Power Stations	**RHEP**	**UKHEP**	**BHEP**	**HHEP**	**CHEP**	**UIHEP**
NAPAF (%)	75	80	80	64	65	85

4. The respondent GRIDCO has submitted that in the present petition OHPC has not mentioned the variation in head of various power stations corresponding to FRL and MDDL which is essential for determination of NAPAF as per CERC Regulations, 2019 as well as OERC Tariff Regulations, 2014.

5. As per Clause 4.38 of OERC Tariff Regulations, 2014 and CERC Regulation, 2019 the declared capacity (DC) plays an important role in determination of plant availability factor for month (PAFM) of a generating station.

6. Further, GRIDCO has submitted that one of the major reasons attributable for non-recovery of Annual Capacity Charges (ACC) of OHPC station is non-completion of timely R&M work of various units under approved period of R&M. Due to this though OHPC realizes its capacity charge for approved period of R&M, it fails to realize its capacity charge after the approved period is over and units are not brought under operation. Therefore, due to this reason relaxation in Normative Plant Availability Factor is not at all permissible so far as regulatory norms are considered. As per CERC as well as OERC Regulation a further allowance in determination of NAPAF may be made by the Commission under special circumstances i.e. abnormal silt problem or other operating conditions and known plant limitations; but not for delay in R&M work of various units.

7. GRIDCO has submitted that from the data submitted by OHPC it is observed that except Hirakud and Chiplima, all other power stations as UIHEP, BHEP, and RHEP have achieved NAPAF or close to it during the control period 2014-15 to 2018-19. In case of

Rengali the NAPAF achieved is more than the target fixed by the Commission during four years out of five years.

8. In view of the above, GRIDCO is of the opinion that the NAPAF of various stations may be determined for control period 2019-20 to 2023-24 judiciously as follows:

   i) By increasing the NAPAF of Rengali Power House as this station has achieved the Normative Annual Plant Availability Factor (NAPAF) determined by OERC in four (4) years out of five (5) years of control period.

   ii) In case of UKHEP, BHEP & UIHEP there is no need for change of NAPAF as determined by OERC for the previous control period.

   iii) In case of HHEP & CHEP, since these plants are very old and have already outlived their useful life period, a further allowance may be allowed by the Commission i.e. difficulties in operating condition while determining the NAPAF for the control period FY 2019-20 to FY 2023-24.

9. Further from the various submission of OHPC, it is understood that a number of units of various OHPC stations will be taken either for R&M or for capital maintenance during the control period FY 2019-20 to FY 2023-24. The renovation as well as capital maintenance of a generating plant envisages better performance and generation of more power from the said generating plant. In view of this, better performance of various stations of OHPC is expected in this control period i.e. FY 2019-20 to FY 2023-24. So, the Commission while calculating NAPAF of various generating stations of OHPC may take note of this aspect.

10. Considering all aspects, GRIDCO has proposed the NAPAF of OHPC stations for the next block period as follows:

UIHEP	:	88 (as per previous control period)
RHEP	:	80 (as per its better performance)
UKHEP	:	87 (as per previous control period)
BHEP	:	83 (as per previous control period)
HHEP	:	73 (a relaxation of 5% may be allowed)
CHEP	:	70 (a relaxation of 5% may be allowed)

11. The respondent Sri R P Mohapatra submitted that renovation and modernization activities are to be taken up whenever major problems in operation are encountered and this work does not have to wait till the completion of life of the project. This will help in extension of life of the units and enable the state to receive cheaper power compared to a brand new hydro power station. From the submission of OHPC it is clear that due to gross

inefficiency of OHPC, it was not able to carry out proper annual maintenance, capital maintenance as per manufacturers' recommendation and renovation and modernization works which results in lower availability of the machines. The actual lower PAFM of the various units due to inefficiency of OHPC cannot be considered for determination of NAPAF of the power houses. The NAPAF has to be determined only basing on conditions which were specified in Regulation 5.4 (a) (v) of OERC Generation Tariff Regulation, 2014. He further submitted that in view of the above, pending notification of new generation tariff regulation by the Commission the NAPAF approved for the period 2014-15 to 2018-19 may continue for the next control period starting from 2019-20.

12. Heard the parties at length. The Commission took note of the oral and written submissions of the petitioner and respondents including the rejoinder of the petitioner. The Commission has to take a realistic view considering the submissions of both the petitioner and the respondents along with guidelines provided in CERC Tariff Regulations and the OERC Tariff Regulations in this regard.

13. The Commission has examined the submissions of OHPC regarding the actual plant availability achieved by OHPC during the last five years i.e. FY 2014-15 to 2018-19. It has been observed that the actual plant availability of individual power stations varies from the NAPAF approved by the Commission for last block period. The station wise analysis is given as follows:

RHEP: For the last control period the Commission had determined the NAPAF of RHEP at 75% considering then operating conditions of the generating units, which was at lower side as compared to the CERC norms. Now, it is observed that the operating conditions of the generating units of RHEP has improved and the average PAF during last five years is more than 80%. Therefore, considering the head variation and present operating conditions of the generating units at RHEP, the Commission feels it appropriate to fix the NAPAF of RHEP at 80% for the control period 2019-20 to 2023-24.

UKHEP: The Commission had fixed the NAPAF of UKHEP at 87% for the last control period. Now, it is observed that the generating units of UKHEP have been in operation for more than 30 years and no R&M activity was undertaken for those units till now. It is also observed that the average NAPAF of UKHEP for the last five years is 81%. Therefore, considering the present operating conditions of generating units of UKHEP, the Commission feels it proper not to alter the NAPAF of UKHEP and keep it 87% for the next control period from 2019-20 to 2023-24. OHPC should improve the NAPAF of UKHEP through proper maintenance of the generating units. The contention of OHPC

that NAPAF is affected by over voltage in Jaynagar Grid is not acceptable since it can be resolved by discussion with OPTCL.

BHEP: The Commission had fixed the NAPAF of BHEP at 83% considering the conditions of the generating units of BHEP, which were in operation for more than 40 years. Now, it is observed that the average NAPAF of BHEP is 81.25% during the last five years. It is further observed that the R&M works of the generating units of BHEP is under progress in phased manner and expected to be completed by the FY 30.06.2022. In view of the above, the Commission feels it proper to fix the NAPAF of BHEP at the level of 83% (as was fixed for the previous control period) for a period of three years i.e. from FY 2019-20 to 2021-22 and 87% for a period of two years i.e. FY 2022-23 and 2023-24 during the next control period.

HHEP: The Commission had fixed the NAPAF of HHEP at 78% for the last control period. During the hearing the representative of OHPC stated that due to less inflow into the Hirakud reservoir during past years, the reservoir level was at lower side, resulting in lower declared capacity and hence low PAF. They have achieved NAPAF only in one year (2015-16) out of the five years of last control period. The PAF of HHEP was 36.42% during the FY 2018-19. The Commission observed that there is silting problem at Hirakud reservoir resulting in less flow of water. Therefore, the Commission feels it appropriate to fix the NAPAF of HHEP at 75% instead of 78%. However, the Commission directs OHPC to maintain the generating units of HHEP properly so as to make it available during the rainy season for more generation reducing spillage of water.

CHEP: R&M works of all the units of this power station have been undertaken. At present Unit-3 is under R&M and will be synchronized shortly as submitted by OHPC. This will enhance the performance of the units during the next control period. Thus the Commission feels to keep the NAPAF at the same level of 75% as approved for the last block period keeping in view the specific constraints faced by this power house as submitted by OHPC.

UIHEP: There is no need to change NAPAF of this power station in view of the fact that the units have rendered satisfactory performance during the last five years. Hence the Commission decides to keep the NAPAF at 88% as approved for the last block period.

14. As discussed above, the Commission re-determines the NAPAF of OHPC stations for the next control period i.e. from 2019-20 to 2023-24 as given in the table below:

Table-4

Name of Power Stations	HHEP	CHEP	BHEP	RHEP	UKHEP	UIHEP
NAPAF (%)	75	75	83- for first 3 years 87 – for subsequent 2 years	80	87	88

Monthly capacity charge of each OHPC stations shall be computed for the FY 2020-21 based on the above NAPAF.

15. However, the capacity of the generating units under Renovation and Modernization shall not be considered in installed capacity while computing the plant availability. Further, while computing the plant availability, the capacity of the generating units under capital maintenance requiring maintenance period of more than 45 days may also be deducted from installed capacity after due approval of the Commission.

16. SLDC shall verify the daily declared capacity of the OHPC power stations and certify the monthly plant availability factor of each power station of OHPC as per the prevailing practice.

17. With the above observation the case is disposed of.

Sd/-
(S. K. Parhi)
Member

Sd/-
(U. N. Behera)
Chairperson