Central Electricity Regulatory Commission

New Delhi

Petition No.328/MP/2018

Coram:

Shri P. K. Pujari, Chairperson
Shri I.S. Jha, Member
Shri Arun Goyal, Member

Date of Order: 09.02.2021

In the matter of

Application under Regulation 31(6) of CERC (Terms and Conditions of Tariff) Regulations, 2014 for recoupment of under recovered energy charges due to shortfall in energy generation for reasons beyond the control of generating station during FY 2017-18 in respect of Sewa-II Power Station.

And

In the matter of

NHPC Limited
(A Govt of India Enterprise)
NHPC Office Complex,
Sector – 33,
Faridabad –121 003

…Petitioner

Vs

1. Punjab State Power Corporation Ltd
The Mall, Near Kali Badi Mandir
Patiala – 147001, Punjab

2. Haryana Power Utilities
(DHBVNL & UHBVNL)
Shakti Bhawan, Sector VI,
Panchkula- 134019, Haryana

3. BSES Rajdhani Power Ltd
2nd Floor, B Block, Nehru Place,
New Delhi 110019

4. Uttar Pradesh Power Corporation Ltd
Shakti Bhawan, 14, Ashoka Road,
Lucknow – 226001, Uttar Pradesh

5. BSES Yamuna Power Ltd
Shakti Kiran Building, Karkardooma,
Delhi – 110092

6. Tata Power Delhi Distribution Ltd
33 kV Sub-station, Hudson Lines,
Kingsway Camp, Delhi – 110009

7. Jaipur Vidyut Vitaran Nigam Ltd.,
Vidyut Bhawan, Janpath,
Jaipur – 302005, Rajasthan

8. Jodhpur Vidyut Vitaran Nigam Ltd.
New Power House, Industrial Area,
Jodhpur-342003, Rajasthan

9. Ajmer Vidyut Vitaran Nigam Ltd
Old Power House,
Hatthi Bhatta, Jaipur Road,
Ajmer-305001, Rajasthan

10. Uttarakhand Power Corporation Ltd
Urja Bhawan, Kanwali Road,
Dehradun- 248001, Uttarakhand

11. Power Department
Union Territory of Chandigarh,
Engineering Department, UT Secretariat,
Sector 9D, Chandigarh - 160009

12. Power Development Department
Government of J&K,
Mini Secretariat, Jammu–180001, J&K **...Respondents**

Parties present:

Shri Rajiv S. Dvivedi, Advocate, NHPC
Shri M. G. Gokhale, NHPC
Ms. Swapna Sheshadri, Advocate, PSPCL
Shri Amal Nair, Advocate, PSPCL
Shri Ankit Bansal, PSPCL
Shri R. B. Sharma, Advocate, BRPL
Shri Himanshu Chauhan, BRPL
Ms. Meghan Bajpeyi, BRPL
Shri Mohit Mudgal, Advocate, BYPL

ORDER

The Petitioner, NHPC Ltd. (hereinafter referred to as NHPC) has filed this petition and subsequently amended the petition seeking the following relief(s):

"(a) Hon'ble Commission may kindly allow recovery of energy charges amounting to ₹6.83 Crs against the shortfall in generation of 27.11 MU, as explained in para- 9 & 10, as per regulation 31(6)(a) of CERC Tariff Regulations, 2014.

(b) To allow issuance of supplementary bill for recovery of shortfall in energy charges amounting to ₹6.83 Crs as per regulation 31(6)(a) of CERC Tariff Regulations, 2014.

(c) To allow issuance of supplementary bill for recovery of shortfall in energy charges after determination of final tariff by Hon'ble Commission as mentioned in para-9.

(d) Pass such other and further order / orders as are deemed fit and proper in the facts and circumstances of the case."

Background

2. Sewa-II Power Station (hereinafter referred to as 'the generating station') located in the State of Jammu and Kashmir comprises of three units of 40 MW each. The generating station was declared under commercial operation on 24.07.2010. The approved annual Design Energy (DE) of the generating station is 533.53 MU and keeping in view the provision of auxiliary losses (1.2%), LADF (1%) and Free Power to the home state (12%), the saleable energy works out to be 459.53 MU.

3. The relevant provisions of Regulation 31 of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as "the 2014 Tariff Regulations") dealing with the methodology for computation of energy charges and billing in respect of hydro-generating stations are as under:

"(4) The energy charge shall be payable by every beneficiary for the total energy scheduled to be supplied to the beneficiary, excluding free energy, if any, during the calendar month, on ex power plant basis, at the computed energy charge rate. Total Energy charge payable to the generating company for a month shall be:

(Energy charge rate in Rs. / kWh) x {Scheduled energy (ex-bus) for the month in kWh} x (100 – FEHS) / 100

31(5) Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis, for a hydro generating station, shall be determined up to three decimal places based on the following formula, subject to the provisions of clause (7):

$$ECR = AFC \times 0.5 \times 10 / \{DE \times (100 - AUX) \times (100 - FEHS)\}$$

Where,
DE = Annual design energy specified for the hydro generating station, in MWh, subject to the provision in clause (6) below.

FEHS = Free energy for home State, in per cent, as defined in Regulation 42.

(6) In case the actual total energy generated by a hydro generating station during an year is less than the design energy for reasons beyond the control of the generating station, the following treatment shall be applied on a rolling basis on an application filed by the generating company:

(a) In case the energy shortfall occurs within ten years from the date of commercial operation of a generating station, the ECR for the year following the year of energy shortfall shall be computed based on the formula specified in clause (5) with the modification that the DE for the year shall be considered as equal to the actual energy generated during the year of the shortfall, till the energy charge shortfall of the previous year has been made up, after which normal ECR shall be applicable:

Provided that in case actual generation form a hydro generating station is less than the design energy for a continuous period of 4 years on account of hydrology factor, the generating station shall approach CEA with relevant hydrology data for revision of design energy of the station.

(b) *In case the energy shortfall occurs after ten years from the date of commercial operation of a generating station, the following shall apply.*

Explanation: Suppose the specified annual design energy for the station is DE MWh, and the actual energy generated during the concerned (first) and the

following (second) financial years is A1 and A2 MWh respectively, A1 being less than DE. Then, the design energy to be considered in the formula in clause (5) of these regulations for calculating the ECR for the third financial year shall be moderated as (A1 + A2 – DE) MWh, subject to a maximum of DE MWh and a minimum of A1 MWh.

(c) *Actual energy generated (e.g. A1, A2) shall be arrived at by multiplying the net metered energy sent out from the station by 100 / (100 – AUX).*

(7) In case the energy charge rate (ECR) for a hydro generating station, computed as per clause (5) of this regulation exceeds ninety paise per kWh, and the actual saleable energy in a year exceeds {DE x (100 – AUX) x (100 – FEHS) / 10000} MWh, the Energy charge for the energy in excess of the above shall be billed at ninety paise per kWh only:

Provided that in a year following a year in which total energy generated was less than the design energy for reasons beyond the control of the generating company, the energy charge rate shall be reduced to ninety paise per kWh after the energy charge shortfall of the previous year has been made up.

Submissions of the Petitioner

4. The Petitioner in amended petition filed on 9.10.2019 has submitted as under:

(a) The present petition has been filed in order to suitably modify the Energy Charge Rate (ECR) in terms of Regulation 31(6)(a) of the 2014 Tariff Regulations for FY 2018-19 for recovery of under-recovered energy charges in FY 2017-18 due to shortfall in generation. The breakup of actual generation vis-à-vis Design Energy is tabulated below:

S.No. (1)	Month (2)	Design Energy (MU) (3)	Actual energy at GT (MU) (4)	Shortfall/Excess (5)=(4)-(3)
1	Apr-16	55.93	91.08	35.15
2	May-16	39.01	73.64	34.63
3	Jun-16	81.92	61.14	-20.78
4	Jul-16	76.69	94.09	17.40
5	Aug-16	84.82	57.73	-27.09
6	Sep-16	40.90	26.73	-14.17
7	Oct-16	21.36	10.52	-10.84
8	Nov-16	14.66	8.60	-6.06
9	Dec-16	11.70	14.30	2.60
10	Jan-17	9.72	10.24	0.52
11	Feb-17	22.61	22	-0.61

12	Mar-17	74.21	36.35	-37.86
Total		533.53	506.42	-27.11

(b) Based on the daily inflow and design inflow data submitted by the Petitioner, the maximum possible generation for 2017-18 is 496.22 MU.

(c) The Actual energy generation at generator terminal during 2017-18 is 506.42 MU and design energy is 533.53 MU. Thus, there is a total shortfall of 27.11 MU (533.53 MU – 506.42 MU) in generation during 2017-18. The reasons for shortfall of 27.11 MU are as under:

A. Shortfall due to reasons beyond the control of petitioner	
Energy shortfall due to less inflow from design inflow	-129.17 MU
Energy shortfall due to excess inflow from design inflow	91.87 MU
Total (A)	**-37.30 MU**
B. Shortfall due to reasons within the control of petitioner	
Energy generated by depleting reservoir (grid requirements)	40.30 MU
Less generation for increasing reservoir (grid requirements)	-26.50 MU
Unit Outages	-1.88 MU
Other constraints (Partial load/ ramping up, down during peaking)	-1.72 MU
Total (B)	**10.19 MU**
Grand total (A+B)	**-27.11 MU**

(d) It is clear from above that, the shortfall of 37.30 MU was beyond the control of petitioner, which got reduced to 27.11 MU due to extra generation of 10.19 MU by petitioner. Hence, generation shortfall of 27.11 MU during 2017-18 due to reasons beyond control of the Petitioner needs to be allowed for recovery during FY 2018-19.

(e) The present submission for recovery of energy charges for the FY 2017-18 is based on the energy charge allowed for the period 2010-14 vide interim tariff order of the Commission dated 06.09.2010 and its subsequent amendment dated 22.09.2010 in petition no. 57/2010 and is as under:

S. No.	Particulars	Value
A	Design Energy (MU)	533.52
B	Actual Generation (MU)	506.42
C	Schedule Energy (Ex-Bus) (MU)	493.40
D	Free Energy (MU)	65.40
E	Net Energy Billed (MU) (C-D)	428
F	Annual Fixed Charges (crore)	198.90
G	Energy Charges to be recovered (Rs. in crore) (50% of F)	99.45
H	ECR (Rs./Unit)	2.164
I	Energy Charges actually recovered (Rs. in crore) (E*H)/10	92.62
J	Under recovery of Energy Charges (Rs. in crore) (G-I)	**6.83**
K	Shortfall in generation due to reasons beyond the control (MU)	27.11
L	Under-recovery of Energy Charges due to reasons beyond the control (Rs. in crore)	**6.83**
M	Modified ECR (Rs./Unit) of FY 2018-19 to recover the shortfall in energy charges as per Regulation 31(6) {Gx10/(Bx(1-0.012)x(1-0.13)}*	**2.28**

*Considering AEC of 1.2% and Free energy plus LADF of 13%

(f) It is clear from above table that the Petitioner has recovered energy charges amounting to ₹92.62 crore corresponding to scheduled ex-bus energy of 493.40 MU against energy charges of ₹99.45 crore. Hence, there is an under-recovery of energy charges of ₹6.83 crore.

(g) Once the recovery for energy charges is allowed by the Commission, the shortfall in energy generation will be recovered at prevailing rate, however, subsequent to issuance of final tariff order for the FY 2017-18, the Petitioner will raise supplementary bill for recovery of shortfall on the basis of revised energy charge.

(h) CEA and CWC were requested to certify the actual inflow data but vide letter dated 31.01.2017. However, they have expressed inability to certify the inflow series on year to year basis stating as under:

> "*The hydrological uncertainties on year to year basis are part of the planning process which can be assessed from the departure of the annual rainfall from the normal. Further the consistency of inflow series of the project can be carried out using relevant hydro-meteorological data for longer period such as more*

than 5 years. In view of the above it may not be possible to certify the inflow series as requested vide above referred letter."

5. The matter was heard on 2.5.2019. The Commission after hearing the parties, directed the Petitioner to submit the following additional information:

a. Rainfall data reported by IMD for the district in which plant is located and other adjoining districts to correlate low inflows; and
b. Planned/forced machine outage data certified by CEA/NRLDC and its correlation with generation data viz a viz available average inflows during the period of such outages.

6. The Petitioner vide affidavit dated 19.6.2019 has filed its reply to the above direction of the Commission and submitted the following information:

a. IMD Rainfall data
b. Planned/forced machine outage data *certified by CEA/NRLDC*
c. Correlation of outage data with energy generation data vis-à-vis available average inflows

7. The matter was heard again on 30.9.2019. The Commission after hearing the parties, directed the Petitioner to file amended Petition, by 9.10.2019.

8. In the original Petition, the Petitioner had prayed that it may be allowed to recover the shortfall in energy charges for the year 2017-18 in the year 2017-18 itself under power to relax. However, based on the ROP of the hearing dated 30.9.2019, the Petitioner vide affidavit dated 9.10.2019 has submitted the amended petition. In the amended Petition, the Petitioner has prayed that the under recovered energy charges of 2017-18 may be allowed to be recovered in 2018-19 by modifying the ECR for the year 2018-19 in terms of regulation 31(6) (a) .

9. Thereafter, the matter was heard on 18.6.2020. The Commission after hearing the parties, directed the Petitioner to submit the following information:

a. Design Energy calculation (in MS Excel) as approved by CEA;
b. Analysis of Annexure-II of the Petition on daily basis in MS Excel;
c. Methodology for calculating daily maximum possible generation during the financial year 2017-18 as claimed in the Petition (in MS Excel);

d. Daily generation report for the days for which energy shortfall has been claimed due to planned/forced outages, reservoir flushing, high trash, plant shutdown due to strike and transmission constraints, etc.

e. Day-wise details of scheduled energy, actual energy injected in the grid and energy accounted for in DSM along with the revenue earned from DSM for such energy; and

f. Any other relevant information/document to justify the claims in the Petition.

10. In compliance with the above directions, the Petitioner has submitted the additional information vide affidavit dated 17.7.2020 and has served copies of the same to the Respondents.

Reply of UPPCL, Respondent No. 4

11. The Respondent No. 4, UPPCL vide its affidavit dated 10.12.2018, has submitted as under:

(a) The Petitioner has demanded that the loss in Electricity Charges for generation below design energy in 2017-18 may be compensated in 2017-18 but the loss compensation has to be on rolling basis as per Regulation 31(6)(a) of the 2014 Tariff Regulations which means that the loss in Energy Charges in 2017-18 is to be carried forward to be compensated in 2018-19.

(b) The recovery of shortfall in energy charges must be done in the years when the actual generation is greater than Design Energy rather than carrying forward to the next years.

(c) The Commission may base the instant case on that of Tehri HEP where the prayer of THDC (the Petitioner therein) to reduce NAPAF from 77% to 74.408% on account of conditions beyond control for period from 17.12.2010 to 28.01.2011 was dismissed by the Commission vide order dated 11.12.2013 in Petition No. 220/MP/2011.

(d) The Petitioner may clarify the method and reasons for classification of controllable and uncontrollable factors and also why silt flushing has been considered as an uncontrollable factor.

Rejoinder of the Petitioner to reply of UPPCL

12. The Petitioner, in response to the reply of the Respondent, UPPCL, has submitted as under vide its affidavit dated 12.2.2019:

(a) The claim of the Respondent that recovery of shortfall in Energy charges must be done in the years when the actual generation is greater than Design Energy rather than carrying it forward to the next years is not in accordance to the provisions of Regulation 31(6) of the 2014 Tariff Regulations.

(b) The claim of the Respondent to take into consideration the case of Tehri HEP in this case is irrelevant as the case of Tehri HEP was for relaxation of NAPAF whereas the present petition is for recovery of shortfall of energy charges.

Reply of BSES Rajdhani Power Limited (BRPL), Respondent No. 3

13. The Respondent BRPL vide its affidavit dated 4.4.2019 has submitted as under:

(a) The Petitioner has submitted that there was shortfall of 27.11 MU during the FY 2017-18 which are claimed to be beyond the control of the Petitioner and this alleged shortfall in monetary terms is stated to be Rs. 6.83 crores. The prayer of the Petitioner is that the Petitioner may be allowed to recover the shortfall after determination of final tariff by the Commission.

(b) However, in the provisions of regulation 31(6) of the 2014 Tariff Regulations, there is absolutely nothing which may allow the Petitioner recoupment of under-recovered energy charges due to shortfall in energy generation for reasons beyond the control of generating station. The Petitioner has also not identified any other regulatory provision under which such a claim can be made and sought from the beneficiaries for recoupment of under-recovered energy charges. The perusal of this regulation would show only that the above regulation provides for the treatment in case actual total energy generated by a hydro generating station during a year is less than the Design Energy. Thus, the contention of the Petitioner for recoupment of under-

recovered energy charges due to shortfall in energy generation for reasons beyond the control of generating station is misconceived and the same is without any basis.

(c) Similarly, the other prayer related to revision of energy bills for the period 2017-18 for recovery of full energy charges are also unfounded. These claims are only imaginary as there are no express regulatory provisions under which such claims can be sought from the beneficiaries for recoupment of under-recovered energy charges, if any, by way of re-determination or under the truing up exercise.

(d) The information supplied by Petitioner to claim the shortfall of 55.84 MU during the FY 2017-18 is not adequate. The Petitioner has filed the following information for this purpose:

i) Provisional ABT based REA issued by NREB for all the 12 months during 2017-18;

ii) Daily inflow data of the Petitioner in respect of Sewa-II power station for FY 2017-18;

iii) Energy Bill dated 05-April.-2018 to the Executive Engineer, Jammu Load Despatch & Metering Jammu;

iv) Certification of actual inflow in respect of Rangit Power Station (2014-15), TLD-III Power Station (2014-15 & 2015-16), and Chamera-III Power Station (2015-16).

(e) The perusal of the letter from the Central Water Commission shows that it is not be possible to certify the inflow series. Thus, the daily inflow series data submitted by the Petitioner has not been certified by the Central Water Commission.

(f) Annexure-II of the petition related to the analysis on daily basis shows that the main shortfall is in the months of June-2017, August-2017, September-2017, October-2017, November-2017 and March-2018. There is no explanation as to whether this shortfall is due to planned or forced shutdown of the machinery and consequent reduced schedule or the same is attributable to low generation as the Petitioner refused extra generation by depleting reservoir level which are expected to fill up, starting April next. There is also huge water spillage during April-2017, June-2017, July-2017 and August-2017. Further, in

the month of June-2017 and August-2017, there is energy shortage as well as the water spillage. There is the practice of doing the maintenance work before the monsoon on all the units of the generating station so that they are ready for maximum generation during the monsoon season. Nothing has been explained on all these issues in the petition and even the Maximum Reservoir Level and Minimum draw down level along with the daily reservoir levels have not been furnished. All this clearly show that the shortfall in energy generation was for reasons attributable to the Petitioner for which no one else except Petitioner is responsible.

(g) The shortfall of 27.11 MU claimed during the FY 2017-18 is required to be verified from independent agencies such as CEA/CWC.

(h) Besides certification of the inflow series, the Petitioner is also required to produce certification from NRPC and NRLDC that the shortfall as claimed is not due to factors which are within the control of the petitioner. However, neither NRPC nor NRLDC have even been included as respondents in the petition.

Rejoinder of NHPC to reply of BRPL

14. In response to the reply of respondent BRPL, the Petitioner vide its affidavit dated 11.6.2019 has submitted as under:

(a) The recovery of AFC in case of hydro power projects are in two parts on 50:50 basis. The recovery of 50% of AFC is entirely dependent upon generation up to the Design Energy and in case of shortfall in generation, the generating company is bound to lose revenue. In case of Sewa-II Power Station in FY 2017-18, the net shortfall in generation was 27.11 MU and loss of energy charges was Rs. 6.83 crore. The Regulations 31(6)(a), 31(6)(b) and 31(6)(c) of the 2014 Tariff Regulations lay down the methodology for recovery of shortfall as applicable to generating stations.

(b) BRPL has commented on operational conditions of the project causing loss in Design Energy. The necessary clarification is as under:

i. In case discharge is beyond reservoir capacity the spillage of water is bound to occur and generating company has no control over it.

ii. During the month of April, actual generation is more than design energy due to excess inflow from design inflow but during the month of June and July there is shortfall in generation due to less inflow from design energy. Hence, there is no water spillage during the said period.

(c) Northern Regional power Committee (NRPC) and NRLDC are the nodal agencies for regulation of power in the region. They are not supposed to certify the data related with loss of generation. As the above agencies have no share allocation from the generating station and as per definition of beneficiary in the 2014 Tariff Regulations, they are not beneficiaries of the power station and, therefore are not made respondents in the instant petition.

(d) Spillage of water and shortfall in generation may occur in any financial year when the discharge is not in line with hydrology considered in Design Energy.

(e) In case of heavy rain in a short span of time, the spillage of water cannot be stopped due to limited capacity of reservoir, whereas deficient discharge in other time will cause loss of design generation.

Reply of Respondent No. 1, Punjab State Power Corporation Ltd. (PSPCL)

15. The Respondent No. 1, PSPCL vide its affidavit dated 8.4.2019 has submitted as under:

(a) The actual inflow cannot always be the same as the design inflow. On some days, the actual inflow will be less and on some other days, it will be more than the design inflow. The Petitioner cannot possibly ask for recovery of energy charges on account of loss of generation every time the actual inflow is less than the designed inflow. As a hydro power generator, the Petitioner ought to be aware that the quantum of inflow is not constant. This is not an unforeseen event at all or an event beyond the control of the Petitioner. The Petitioner being in the business of generation of hydro power ought to have been aware of this. Therefore, the Petitioner has no basis for claiming relief by citing the loss of generation on account of less inflow.

(b) Regulation 31(6) of the 2014 Tariff Regulations specifically states that the treatment under Regulation 31(6)(a) shall be applied only when the total energy generated is less than the Design Energy due to reasons beyond the control of the hydro generating station. The reasons furnished by the Petitioner cannot be said to be 'beyond the control' of the Petitioner. The Petitioner could have made arrangements to deal with the aspect of silt flushing. Less inflow is a common event for a hydro power generator and, therefore, not something that the Petitioner could not have foreseen at the time of designing the project.

(c) The Petitioner has placed on record the letter dated 23.01.2017 of the Central Water Commission (CWC), whereby CWC has expressed its inability to certify the inflow series on year to year basis. Therefore, CWC has taken the position that the hydrological uncertainties are part of the planning process and are to the account of the generator. By no stretch of imagination is the letter dated 23.01.2017 a proof of the Petitioner's claim that the recovery sought due to the shortfall in generation is for reasons beyond the control of the Petitioner. In fact, the letter states to the contrary.

Rejoinder of NHPC to reply of PSPCL

16. In response to the reply of respondent PSPCL, NHPC vide its affidavit dated 11.6.2019 has submitted as under:

(a) The generation is affected by seasonal variations. However, if overall annual discharge is less than the expected discharge, the loss of generation is bound to be there. The petitioner has lost 37.30 MU in some months, whereas 10.19 MU extra energy is generated in some months. Hence, the Petitioner has claimed only 27.11 MU on account of less inflow.

(b) The letter of CWC clearly mentions that the hydrological uncertainties on year-to-year basis are part of the planning process which can be assessed.

Analysis and Decision

17. The Petitioner has submitted the actual average inflows measured at dam site for each day of 2017-18 for which the shortfall has been claimed. Further, based on

the following formulae along with certain adjustments, the Petitioner has calculated the daily maximum possible generation for 365 days based on actual inflows:

Maximum Possible Generation during a day (MU)=
(Average inflow for i^{th} day) X (Maximum generation corresponding to installed capacity) / (Rated inflow for installed capacity)

Where, the capacity of the generating station is 120 MW and rated inflow is 24.25 cumecs corresponding to 120 MW capacity. The sum of daily maximum possible generations for 365 days i.e. the annual maximum possible generation has been calculated by the Petitioner as 496.22 MU.

18. To cross check the correctness of maximum possible generation of 496.22 MU as calculated by the Petitioner, we have used the following formula (used by CEA for arriving at the Design Energy of the station) for arriving at the power potential of actual inflows restricted to 120 MW and then the daily Maximum possible energy generation in MU

Maximum Possible Generation during a day (MU) = (559.2x0.90x9.8/1000)x(24/1000)x Actual Inflow of the day available for generation

Where 559.2 is the rated head of the plant in meter, factor 0.90 represents overall plant efficiency of 90% and 9.8 m/s^2 is acceleration due to gravity. These figures have been used by CEA for arriving at the Design Energy of the plant.

19. Based on the above methodology, maximum possible energy generation for the year 2017-18 works out to 478.94 MU (restricting the maximum power to 120 MW i.e. capacity of the plant during peak season) against the maximum possible generation of 496.22 MU as submitted by the Petitioner. The difference is due to the fact that the Petitioner has considered more power generation in favourable conditions e.g. for certain days during lean seasons when actual generation during a day is more than theoretical possible generation, the Petitioner has replaced the

theoretical value with the actual value. Further, this gap also includes the additional energy generated by the Petitioner by use of overload capacity on several days during peak season.

20. Considering the fact that the Petitioner by way of these adjustments has increased the extent of maximum possible generation, we have considered the generation of 496.22 MU as calculated by the Petitioner for further deliberations.

21. It is noticed that the Petitioner has been able to generate 506.42 MU which is more than the maximum possible generation as calculated by the Petitioner. The additional generation over and above the maximum possible generation is due to depletion of reservoir level on certain days to produce the additional energy.

22. Design Energy of the generating station is 533.53 MU. During the FY 2017-18, the Petitioner has claimed a shortfall of 27.11 MU in generation, as the actual generation was 506.42 MU.

23. The Petitioner has divided the energy shortfall into two parts, namely:

a) Net excess energy generation of 10.19 MU due to factors which were under the control of the Petitioner. The breakup is as under:

i) Energy generated by depleting reservoir level on some days: 40.30 MU

ii) Less generation for increasing reservoir level on some days: (-) 26.50 MU

iii) Unit Outage: (-) 1.88 MU

iv) Other constraints (partial load/ ramping up, down during peaking): (-) 1.72 MU

** Note: sum of i) and ii) above i.e. (+) 13.80 MU is net excess generation by managing reservoir level and sum of iii) and iv) i.e. (-) 3.60 MU is the loss for which the Petitioner is accountable.*

b) Shortfall of 37.30 MU which was for the reasons not under the control of the Petitioner. The breakup of the same is as under:

i) Energy shortfall due to less inflow: (-) 129.17 MU

ii) Energy gain due to excess inflow: 91.87 MU

** Note: the sum of i) and ii) i.e (-) 37.30 MU represents the short fall due to low inflows in comparison to the design inflows associated with design year*

24. The Respondent, UPPCL has submitted that recovery of shortfall in energy charges must be done in the years when the actual generation is greater than Design Energy rather than carrying it forward to the next years. In our view, this suggestion of the Respondent is against the provisions of the 2014 Tariff Regulations and cannot be considered. The Respondent, UPPCL has further submitted that the instant petition may be considered on basis of the order dated 11.12.2013 in the Petition no. 220/MP/2011. However, this is not relevant in the present case as order dated 11.12.2013 related to prayer for reduction in NAPAF, whereas present petition is for relief on account of shortfall in generation on account of uncontrollable factors and is covered under provisions of Regulation 31(6)(a) of the 2014 Tariff Regulations.

25. The Respondent, BRPL has contended that recoupment of under-recovered energy charges due to shortfall in energy generation and also the treatment by way of modification in the Design Energy for the year following the year of energy shortfall amounts to double benefits. Per contra, the Petitioner has stated that there is no case of double benefit and claimed relief is covered under provisions of the 2014 Tariff Regulations. The Petitioner has also submitted that the Respondent has in effect challenged the provisions of the Regulations and the same is not permitted through this Petition. The Commission is of the view that there is no double benefit to the Petitioner as by modification of Design Energy and corresponding increase of energy charge rate for the year following the year of energy shortfall, is allowed only till the energy charge shortfall of the previous year has been made up.

26. The Respondent, BRPL has also pointed out that the Petitioner has not been able to utilise the full potential of the inflows, especially during June-August 2017 as there was lot of spillage as observed from the 365 days data as submitted by the Petitioner. This proposition is misconceived since the capacity of the reservoir is limited and as per technical parameters, whenever the inflows are more than the design inflow, spillage is bound to occur. From the scrutiny of the 365 days data as submitted by the Petitioner, we observe that the spillage has occurred only on the days where the inflows are more than the design inflow. Therefore, we do not agree to the contention of the Respondent that the Petitioner has not been able to utilize the full potential of the inflows and that the Petitioner has allowed water to spill over.

27. Some of the Respondents have submitted that the data submitted by the Petitioner has not been verified by any independent agency. Therefore, we have carried out further analysis in the following paragraphs to ascertain reasonability of the claim of the Petitioner which also includes whether the Petitioner has been able to utilize the full potential of actual inflows. We now proceed to analyse the claims of the Petitioner.

28. With regard to the claim of the Petitioner that energy shortfall for the year 2017-18 was due to uncontrollable factors, the Commission is of the view that low generation in comparison to Design Energy in a hydro generating station can be attributable to the following reasons:

(i) Low inflows in comparison to the design inflows associated with design year.

(ii) Prolonged planned/ forced outage of machines.

(iii) Inefficient operation of the plant which may include low overall efficiency of turbine and generator, high auxiliary power consumption, high losses in water conductor system etc.

(iv) Non-utilization of maximum power potential of actual inflows due to excessive spillage.

29. We analyse each of the above reasons in respect of the present claim of the Petitioner.

(i) Low inflows in comparison to the design inflows associated with design year.

30. Vide ROP of hearing dated 02.05.2019, the Petitioner was directed to submit rainfall data of India Meteorological Department (IMD) to correlate low inflows. The Petitioner vide affidavit dated 19.6.2019 has submitted rainfall data for the period from 2013 to 2017 for Kathua District where the instant generating station is located. Further, the Petitioner was directed to get the inflow data verified from CEA/ CWC. With regard to the certification of the inflow data by CEA/ CWC, the Petitioner has enclosed a letter from CWC dated 23.01.2017 where CWC had categorically mentioned its inability to certify the inflow data in respect of the generating station. As such, in absence of certified data by CEA/ CWC, we have relied upon the analysis of IMD data for the year 2017 and 2018 and data related to outages (planned or forced) to assess whether low inflows was one of the major reasons for low generation in comparison to Design Energy.

31. The rainfall data issued by the India Metrological Department (IMD) in respect of Kathua district for the years 2017 and 2018 (verified from IMD website) is given below:

Rainfall in mm

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
2017	132.8	34.6	40.2	44.2	24.8	144.8	336.4	566.8	57.2	0.0	0.5	93.5
2018	7.2	63.6	17.9	25.9	12.5	63.4	261.4	683.7	175.5	13.3	8	12.8

Note: The District Rainfall in millimetres (R/F) shown above are the arithmetic averages of rainfall of stations under the District

% Departure from Long Period Averages

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	55	-41	-11	121	98	132	-13	40	-55	-100	-94	260
2018	-92	8	-61	30	0	1	-33	69	38	-54	-7	-51

Note: % Departures, are the departures of rainfall from the long period averages of rainfall for the district.

32. As per India Meteorological Department (IMD), which is the Central agency that records and archives rainfall data in India:

> *When the rainfall for the monsoon season of June to September for the country as a whole is within 10% of its long period average, it is categorized as a "Normal" monsoon. It is categorized as "Excess" monsoon, if it is above 110 % of long period average and "Deficient", if it is below 90% of long period average. The performance of monsoon rainfall over smaller areas of the country is monitored by evaluating the departures from the normal for each meteorological sub-division and district. The rainfall is classified as excess, normal deficient or scanty as per the following criteria. Excess +20% of normal or more, 'Normal: + 19% to -19% of normal, Deficient -20% to -59% of normal, Scanty: -60 % of normal or less*
>
> *The 'monthly normal' rainfall of a station was calculated using all the available data during the period 1941-1990. (In the Statistical Abstract, India 2004 this period was 1901-1970). (The monthly "normal rainfall" of the sub-division is the mean of monthly normal rainfall of the corresponding stations and "annual normal rainfall " is the sum of the monthly normal rainfall for all the 12 months.*

33. Correlating the above tabulated rainfall data as per IMD reports, indicates low rainfall in comparison to long period averages. Accordingly, the energy shortfall of 37.30 MU between the maximum possible generation (496.22 MU) and design energy (533.53 MU) represents shortfall due to less inflows and we, thus, hold that the same was beyond the control of the Petitioner.

(ii) Prolonged forced/ planned outage of machines

34. In order to rule out the prolonged planned/ forced outage of machines, their impact on energy generation and in order to understand whether outage of a machine in anyway affected the energy generation by non-utilization of available water flow, the Commission vide ROP of the hearing dated 2.5.2019 directed the Petitioner to furnish the planned and forced outage data for 2017-18 along with its

correlation with energy generation. In response, the Petitioner vide affidavit dated 19.6.2019 has submitted that there have been 55 instances of forced and planned outages during 2017-18. We note that out of these 55 outages, 17 incidences of forced outage were due to problem in malfunctioning of bus isolator, over fluxing relay operated, malfunctioning of MIV, GT neutral over current protection, tripping of DC distribution MCB, flash in metering & synchronising panel, transmission constraints, other constraints, etc. as reported by the Petitioner. Further, it is noticed that there are 38 instances pertaining to the months of November 2017 and December 2017 and one event on 2.8.2017 during which the plant was under planned shutdown for carrying Annual Maintenance. In order to estimate energy shortfall due to forced outages and planned outages, calculations have been made. Based on these calculations, the results in respect to the 55 cases of outage are summarized as under:

Events (a)	**Design Energy (MU) (b)**	**Spillage (Cumecs) (c)**	**Maximum possible generation based on actual inflow available (MU) (d)**	**Actual Generation at GT (MU) (e)**	**Energy shortfall (MU) (f) = (e)-(b)**	**Claimed under the head:- Shortfall Beyond control of Power Station (g) = (d)-(b)**	**Claimed under the head:- Shortfall Within control of Power Station (h)=(e)-(d)**
17 (Forced/ Machine Outage	36.65	76.81	37.30	34.58	-2.07	0.65	-2.72
38 (Planned outages)	18.18	22.34	17.77	14.67	-3.51	-0.41	-3.10
Total	**54.83**	**99.15**	**55.07**	**49.25**	**-5.58**	**0.24**	**-5.82**

35. From the above data, we note that out of 55 outages as reported by the Petitioner, during 17 instances of forced/ machine outages, there was shortfall of 2.07 MU in energy generation. During these instances, the maximum possible generation from available inflows was 37.30 MU as against design energy of 36.65 MU and the actual generation was 34.58 MU. As such, out of maximum possible

potential of 37.30 MU, the Petitioner was able to generate only to the extent of 34.58 MU and has counted the balance of (-)2.72 MU (less generation due to unit outage and due to increasing reservoir level) being attributable to itself.

36. It is noticed that there were 7 days when spillage has occurred during these 17 instances (forced/ machine outages) and from scrutiny of the outage data submitted by the Petitioner, it is observed that these days (when spillage has occurred) are the days when the inflows were more than the design inflows except on one day i.e. on 10.8.2017 when spillage was due to machine outages and the corresponding shortfall in energy generation is attributable to the Petitioner. As such, the Petitioner cannot be faulted with the excessive spillage or non-utilization of full potential of actual inflows due to inefficient operation or due to forced outages except for the loss of 2.72 MU less generation due to unit outage and for increasing the reservoir level for which the Petitioner has taken the responsibility by putting them under the list of reasons within its control.

37. For the remaining 38 instances during which the plant was under planned shutdown for carrying Annual Maintenance, the maximum possible generation from available inflows was 17.77 MU as against design energy of 18.18 MU and the actual generation was 14.67 MU. As such, out of maximum possible potential of 17.77 MU, the Petitioner was able to generate only to the extent of 14.67 MU and has counted the balance of (-) 3.10 MU due to less generation to increase reservoir level and other constraints being attributable to itself. The shortfall of 0.41 MU during these 38 instances was solely attributable to less inflows which was not under the control of the Petitioner and same is included in the shortfall of 129.17 MU claimed by the Petitioner as indicated at paragraph 4(c) above. As such, it is noticed that the planned outage of machines during the lean months had led to shortfall in the energy

generation to the extent of 3.10 MU for which the Petitioner has taken the responsibility by putting them under the list of reasons within its control.

38. In view of the above deliberations, it is held that these 55 outages (17 forced/ machine outages and 38 planned outages) resulted into shortfall in the energy generation to the extent of 5.82 (=2.72+3.10) MU (including less generation due to unit outage, other constraints and due to increasing reservoir level) for which the Petitioner has taken the responsibility by putting them under the list of reasons within its control.

(iii) Inefficient operation of the plant & Non-utilization of maximum power potential of actual inflows due to excessive spillage

39. Maximum possible annual generation with available actual inflows after accounting for the generation loss for the reasons which were beyond the control of the Petitioner and which are attributable to the Petitioner, the possible generation at generator terminal has been assessed as under against the actual generation of 506.42 MU:

(a) Possible generation assessed at generator terminal after accounting for the generation loss due to reasons beyond the control of the Petitioner as discussed above:

1.	Design Energy of the instant generating station	533.53 MU
2.	Energy shortfall due to less inflows (on net basis)	(-)37.30 MU
3.	Energy that could have been generated by utilizing available actual inflows 3=1+2	496.23 MU

(b) Possible energy generation at generator terminal after accounting for the reasons within the control of the Petitioner as considered by the Commission:

		Based on actual available flow at 100% machine capacity
1.	Remaining Energy that could be generated after taking into account reasons beyond control	496.23 MU
2.	Excess generation due to reasons within the control of Petitioner (as claimed by the Petitioner)	10.20 MU {(+)13.80 MU by managing the reservoir level and (-) 3.60 MU due to unit outages etc.}
3.	Remaining Energy that could be generated 3=1+2	506.43 MU

40. In view of the above calculations and the fact that actual generation of the generating station i.e. 506.42 MU is almost in agreement with the theoretical calculations (506.43 MU), it is held that the Petitioner has been able to generate according to the actual inflows after accounting for the reasons under its control and reasons beyond its control. Accordingly, the Petitioner cannot be faulted with inefficient operation of the plant and non-utilization of maximum power potential of actual inflows or excessive spillage.

41. In light of above deliberations, the Commission is of the view that the Petitioner shall be allowed to recover shortfall in energy charges in proportion to the energy shortfall which occurred due to reasons which were not under the control of the Petitioner i.e. 37.30 MU. However, the Petitioner by managing the reservoir level has managed to generate additional energy of 13.80 MU. The Petitioner has accounted this additional generation under the reasons which were under the control of the Petitioner, nevertheless same needs to be adjusted for arriving at the allowable recovery of energy charges. Accordingly, out of total shortfall of 27.11 MU, shortfall for reasons under the control of the Petitioner has been taken as 3.60 MU (due to

plant outages etc.) and shortfall for the reasons beyond the control of the Petitioner has been taken as 23.51 MU {27.11 MU - 3.60 MU}.

42. The Petitioner has submitted the following position with respect to under recovery of energy charges:

S. No.	Particulars	Value
A	Design Energy (MU)	533.52
B	Actual Generation (MU)	506.42
C	Schedule Energy (Ex-Bus) (MU)	493.40
D	Free Energy (MU)	65.40
E	Net Energy Billed (MU) (C-D)	428
F	Annual Fixed Charges (crore)	198.90
G	Energy Charges to be recovered (Rs. in crore) (50% of F)	99.45
H	ECR (Rs./Unit)	2.164
I	Energy Charges actually recovered (Rs. in crore) (E*H)/10	92.62
J	Under recovery of Energy Charges (Rs. in crore) (G-I)	**6.83**
K	Shortfall in generation due to reasons beyond the control (MU)	27.11
L	Under recovery of Energy Charges due to reasons beyond the control (Rs. in crore) (G-I)	**6.83**

43. Respondent BRPL has submitted that the generating station had generated an excess of 7.50 MU beyond scheduled energy and the Petitioner would have sold this energy in the market resulting in revenue to the power station (approx. Rs. 1.94 crore). In our view, the stated energy of 7.50 MU being sold in market is ill-conceived since NHPC has stated that as per allocation letter issue by MoP, full power is allotted to different beneficiaries of Sewa-II Power Station (except for free power to Home State). Thus, Sewa-II Power Station has no free power to be sold in power exchange for recovery of additional revenue.

44. The Commission vide ROP of the hearing dated 18.6.2020 directed the Petitioner to submit the details of energy accounted in DSM. The Petitioner, has vide affidavit dated 17.7.2020, submitted the details of energy accounted for in DSM. Payment for energy under DSM is governed by provisions of the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2014 (hereinafter referred to as "the 2014 DSM Regulations"). It has been submitted that 8.97 MU has been accounted for in DSM and corresponding revenue earned from DSM is Rs. 300.31 Lakh. Regulation 31(6)(a) of the 2014 Tariff Regulations provides for recovery of energy charge shortfall corresponding to the energy which could not be generated for the reasons beyond the control of the Petitioner. There is no doubt that the energy accounted for in DSM is actual energy generated and also that the Petitioner has received payment for the same in terms of provisions of the 2014 DSM Regulations. Therefore, the energy that has been accounted for in DSM cannot be counted towards shortfall in energy in terms of Regulation 31(6)(a) of the 2014 Tariff Regulations and, therefore, corresponding energy charge cannot be recovered in terms of that regulation. Thus, revenue generated by the Petitioner under DSM needs to be appropriately accounted for while deciding the quantum of shortfall under provisions of Regulation 31(6)(a) of the 2014 Tariff Regulations.

45. We are also conscious of the fact that generating stations are required to provide support to the grid and for that purpose, payments for energy supplied is accounted for under provisions of the 2014 DSM Regulations. Also, often the support to the grid is through governor mode operation and is beyond control of the Petitioner. Therefore, in case the revenue received under provisions of the 2014 DSM Regulations is less than the energy that would have been received had the

same been supplied to the beneficiaries, the generator should not be adversely affected. Thus, with a view to balance the interest of the generator as well as the beneficiaries, it would be prudent to calculate the energy charge shortfall by adjusting lower of:

a) the actual revenue earned by the generating station through DSM in the financial year (for which shortfall is claimed) and

b) the amount that would have been paid by the beneficiaries had the same energy been scheduled and received by the beneficiaries in that financial year.

46. In the instant case, the Petitioner has been able to generate revenue to the tune of Rs. 300.31 Lakh for the energy accounted for in DSM i.e 8.97 MU. On the other hand, if this energy (8.97 MU) would have been scheduled to the beneficiaries, the scheduled energy would have increased to 502.37 (= 493.40+8.97) MU and the energy charge shortfall of the generating station would have reduced in comparison to the claimed energy charge shortfall of Rs.6.83 crore. The following table captures the reduction in energy charge shortfall after adding the energy accounted for in DSM in the actually scheduled energy:

	Schedule Energy (Ex-Bus) (MU)	**Free Energy (MU)**	**Net Energy Billed (MU)**	**ECR (₹/Unit)**	**Allowed Energy Charges (crore)**	**Energy Charges actually recovered (crore)**	**Energy charge shortfall (crore)**
	1	**2**	**3=1-2**	**4**	**5**	**6=3x4/10**	**7=5-6**
As claimed by the petitioner based on actually scheduled energy	493.40	65.40 (As per Regional Energy Account)	428	2.164	99.45	92.62	6.83
As modified by adding the DSM energy in the actually scheduled energy	502.37 (493.40+8.97)	65.31 (12% free energy +1% LADF)	437.06	2.164	99.45	94.58	4.87

47. From the above table, we observe that the energy charges recoverable for the energy accounted for in DSM would have been Rs.1.96 (= 94.58-92.62) crore as against Rs.3 crore recovered by the Petition from the DSM pool.

48. Since the energy charge accounted for in DSM (Rs.1.96 crore) is on lower side as compared to revenue earned from the DSM pool (Rs.3 crore), the actual shortfall of Rs.6.83 crore reduces to Rs.4.87 (=6.83-1.96) crore. Accordingly, the energy charge allowed to be recovered in the FY 2018-19 due to shortfall in energy generation from the Design Energy during 2017-18 has been calculated as under:

Total Shortfall in generation during FY 2017-18 (MU)	A	27.11
Actual under-recovery of energy charges during FY 2017-18 (₹ crore)	B	6.83
Total under-recovery of energy charges during FY 2017-18 after accounting for the revenue which would have been earned if the energy accounted under DSM would have been scheduled to the beneficiaries (in ₹ crore)	C	4.87 (= 6.83-1.96)
Shortfall in generation due to reasons beyond control (MU)	D	23.51
Shortfall in energy charges allowed to be recovered during FY 2018-19 (₹ crore)	E=C*D/A	4.22

49. In terms of Regulations 31(6)(a) and 31(6)(c) of the 2014 Tariff Regulations, we decide that the Design Energy for 2018-19 is 506.42 MU till the energy charge shortfall of Rs. 4.22 crore for 2017-18 is recovered by the Petitioner by revision of energy bills for 2018-19. Further, the difference in energy charge shortfall to be recovered for 2017-18 which may arise after the true-up of tariff for the period 2014-19 shall be recovered directly by the generating station from beneficiaries through supplementary bills after true-up.

50. Petition No. 328/MP/2018 is disposed of in terms of above.

Sd/	**Sd/**	**Sd/**
(Arun Goyal)	**(I. S. Jha)**	**(P. K. Pujari)**
Member	**Member**	**Chairperson**