Central Electricity Regulatory Commission
New Delhi

Petition No.142/MP/2018

Coram:

Shri P. K. Pujari, Chairperson
Dr. M.K. Iyer, Member
Shri I.S. Jha, Member

Date of Order: 10.10.2019

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 2016-17 in respect of Parbati-III 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, 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. Uttrakhand Power Corporation Ltd
UrjaBhawan, Kanwali Road,
Dehradun- 248001, Uttrakhand

11. Himachal Pradesh State Electricity Board Ltd
Vidyut Bhawan, Kumar House
Shimla – 171004, Himachal Pradesh

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

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

Parties present:

Shri Prashant Kaul, NHPC
Shri A.K. Pandey, NHPC
Shri V.N. Tripathi, NHPC
Shri Jitender Kumar, NHPC
Shri Piyush Kumar, NHPC
Ms. Seema Mishra, NHPC
Shri Dhanush C.K, NHPC
Shri R.B. Sharma, Advocate, BRPL
Shri Mohit Mudgal, Advocate, BYPL

Ms. Swapna Seshadri, Advocate, PSPCL

ORDER

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

> *(a) Hon'ble Commission may kindly allow recovery of energy charges amounting to `6.13 Crs in FY 2017-18 against the shortfall in generation of 18.36 MU in FY 2016-17 as per regulation 31(6)(a) of CERC Tariff Regulations, 2014 as explained in para- VIII & X of the petition.*
>
> *(b) Hon'ble Commission is requested to allow modified design energy for FY 2017-18 so that the recovery of allowable energy charges is assured as explained in para-XI of the petition.*
>
> *(c) To allow revision of energy bills for the period 2017-18 which were already raised to beneficiary for recovery of energy charges.*
>
> *(d) To allow issuance of supplementary bill for recovery of balance shortfall in energy charges directly from beneficiaries after determination of final tariff by Hon'ble Commission as mentioned in para-IX of the petition.*
>
> *(e) Pass such other and further order / orders as are deemed fit and proper in the facts and circumstances of the case.*

Background

2. Parbati -III Power Station having installed capacity of 520 MW (hereinafter referred to as the generating station) located in the State of Himachal Pradesh comprises of four units of 130 MW each. The generating station was declared under commercial operation on 06.06.2014. The approved annual Design Energy (DE) of the generating station is 1963.29 MU.

3. The provisions 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 recovery of energy charge shortfall in respect of hydro-generating stations are as under:

"31(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.

"31(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."

4. Before we deal further, Commission with regard to Design Energy of the instant generating station, in petition no.7/GT/2017 vide order dated 05.04.2019 has observed as under:

"41. As regards Design Energy, the Commission vide its order dated 25.6.2014 has observed as under:

"19.The Petitioner has submitted that the completion of upstream Parbati-II HEP has been delayed due to various reasons and the said project could not be made operational prior to the commissioning of this generating station. It has also submitted that the tail race water of Parbati-II HEP would not be available for

generation at this project and therefore, this generating station would operate as ROR scheme till the commissioning of upstream Parbati-II HEP, based on the fact that the live storage capacity of this project is only 1.28 MCM which is not sufficient to provide minimum three hours peaking with four units. It has further submitted that the post-sedimentation live storage capacity is only 0.87 MCM which is just sufficient to meet 1.36 hours of peaking. The Petitioner has also submitted that the annual design energy of this project, on stand-alone basis, till the commissioning of upstream Parbati-II HEP, with downstream discharge as 1.15 cumecs and updated discharge series (1973-74 to 2010-11) approved by CEA, in a 90% dependable year would be 701.40 Million Units. It has stated that the design energy of this project would be reviewed by CEA on the commissioning of upstream Parbati-II HEP. Considering the above, we allow the design energy of 701.40 Million Units as approved by CEA till the commissioning of the upstream Parbati-II HEP."

42. The Petitioner has claimed the Design Energy of 701.40 MU as approved by CEA till the commissioning of Parbati-II HEP of the Petitioner. However, during the course of hearing, the Petitioner, in its bid to reduce the tariff of the generating station has requested the Commission to consider the original Design Energy (1977.20MU) in respect of this generating station for calculation of Energy Charge Rate (ECR) even though matching inflows are not available due to non-commissioning of the up-stream project .

.....

48. We have examined the proposal of the Petitioner and the submissions of the Respondents herein. The proposal of the Petitioner suggests that it is willing to reduce tariff by reducing the ECR based on the original design energy. However, the Petitioner has not suggested any such relief towards the recovery of capacity charges due to the non-commissioning of Parbati-II HEP of the Petitioner. The Respondent beneficiaries, apart from relief in Energy Charges as suggested by the Petitioner, are also seeking relief in capacity charges due to low NAPAF (68% in place of 90% for pondage plants) due tolow inflows on account of the non-commissioning of Parbati-II HEP. In our view, the consequences on account of the

non-commissioning of the upstream project (Parbati-II HEP) cannot be considered on the downstream project (this generating station) in terms of lower recovery of capacity and energy charges except to the extent agreed to by the generator. Further, the Commission in its earlier order dated 25.6.2014 had decided the issue of lower design energy (as approved by CEA) and lower NAPAF and the same were accepted by the Respondents and had therefore attained finality. However, in order to provide further relief to the respondents, no incentive shall be allowed to the generating station on account of higher PAF in comparison to NAPAF of 68%, till the commercial operation of all units of the upstream Parbati II HEP. ***In view of this, we are inclined to consider the Design Energy of 1963.29 MUs instead of the Design Energy of 701.40 MUs, thereby leading to overall reduction in tariff.*** *Accordingly, the Design Energy of 1963.29 MUs as considered in the approval of RCE by the MOP, GOI in its letter dated 9.10.2018 has been considered for the generating station..."*

5. It is noted that the Design Energy of 1963.29 MU instead of 701.40 MU was considered by the Commission vide Order dated 5.4.2019 in Petition No. 7/GT/2017 as proposed by the petitioner for overall reduction in Tariff and as agreed by the beneficiaries. However, earlier it was decided that the generating station will not be able to generate 1963.29 MUs till commissioning of the upstream project i.e. Parbati-II H.E.P. In view of this, any shortfall in generation has to be compared with the Design Energy of 701.40 MU as approved by the Commission vide interim order dated 25.6.2014 and final order dated 28.03.2016 in petition no. 228/GT/2013. Accordingly, the petition is examined based on the Design Energy of 701.40MU.

Submissions of the Petitioner

6. The Petitioner in this petition 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 2017-18 for recovery of under-recovered energy charges in FY 2016-17 due to shortfall in generation. The breakup of actual generation vis-à-vis Design Energy is tabulated below:

S. No.	Month	Design Energy (MU)	Actual Generation at GT (MU)	Shortfall/ Excess (MU)	Actual PAF (%)
1	**2**	**3**	**4**	**5=4-3**	**6**
1	Apr-16	44.76	32.13	-12.63	51.73
2	May-16	66.49	68.73	2.24	52.51
3	Jun-16	114.71	100.34	-14.37	65.88
4	Jul-16	147.09	117.71	-29.38	76.80
5	Aug-16	116.81	177.51	60.70	87.20
6	Sep-16	74.17	79.22	5.05	94.82
7	Oct-16	37.37	34.55	-2.82	65.71
8	Nov-16	24.91	19.17	-5.74	38.82
9	Dec-16	19.74	14.16	-5.58	27.07
10	Jan-17	17.18	12.30	-4.89	24.43
11	Feb-17	13.71	11.61	-2.10	25.76
12	Mar-17	24.46	15.06	-9.40	29.73
Total		**701.40**	**682.49**	**-18.91**	

(b) Based on available flows, Maximum possible generation was 698.32 MU.

(c) The total shortfall in generation during 2016-17 is 18.36 MU (701.40 MU – 682.49 MU).

(d) Out of the total shortfall of 18.91 MU, shortfall of 18.36 MU was beyond the control of Petitioner while balance shortfall of 0.55 MU was not uncontrollable. Hence, as per Regulation 31(6)(a) of the 2014 Tariff Regulations, the shortfall of 18.36 MU needs to be recovered by the Petitioner during FY 2017-18. The details of the shortfall and reasons for the shortfall are as under:

A. Shortfall due to reasons beyond the control of petitioner	
Energy shortfall due to less inflow than design inflow	-107.26 MU
Energy generated due to excess inflow than design inflow	104.13 MU

Energy loss due to high silt	-15.23 MU
Total (A)	**-18.36 MU**
B. Shortfall due to reasons within the control of petitioner	
In order to meet grid requirement (excess generation), the petitioner has to deplete the reservoir level with marginal increase in generation and had to operate the machines at lower head. Subsequently, at appropriate time, the reservoir level has been maintained with less generation. The detailed analysis of such operation is placed at Annex-II of the petition.	
a) Energy generated by depleting reservoir level on some days	11.66 MU
b) Less generation for increasing reservoir level on some days	-11.54 MU
Other constraint (Partial load/ramping up/down during peaking etc.	-0.67 MU
Total (B)	**-0.55 MU**
Grand Total (A+B)	**- 18.91 MU**

(e) The present submission for recovery of energy charges for the FY 2016-17 is based on the energy charge allowed for the period from 24.03.2014 to 31.03.2014 vide order dated 28.03.2016 in petition no. 228/GT/2013 as under:

Schedule * Energy (Ex-Bus) (MU)	Free* Energy (MU)	Net Energy Billed (MU)	ECR (Rs/Unit)	Annual Fixed Charges (Crs.)	Energy Charges to be recovered (Crs.)	Energy Charges actually recovered (Crs.)	Under recovery of Energy Charges (Crs.)
1	**2**	**3=1-2**	**4**	**5**	**6=50% of 5**	**7=3*4/10**	**8=7-6**
666.68	**86.95**	**579.74**	**2.74**	**330.09**	**165.04**	**158.73**	**-6.31**

(f) As out of the total loss of 18.91 MU, the loss of 0.55 MU was within the control of the petitioner, shortfall of energy charges amounting to Rs. 6.13 crore corresponding to 18.36 MU only may be allowed, which was due to reasons beyond the control of the Petitioner. Details are as under:

Total Shortfall in generation during FY 2016-17	A	18.91 MU
Total under recovery of energy charges during FY 2016-17	B	Rs. 6.31 Crs
Shortfall in generation due to reasons beyond control	D	18.36 MU
Shortfall in energy charges to be recovered during FY 2017-18	E=D*B/A	**Rs. 6.13 Crs**

(g) Under prevailing mechanism of Regulation 31(6) of the 2014 Tariff Regulations, the Petitioner is not in a position to recover the shortfall allowed by

CERC. For example, in case of order dated 17.04.2017 in petition no. 251/MP/2015 for Chamera-III Power station for FY 2014-15, the petitioner could only recover Rs. 14.92 crore against allowed recovery of Rs. 19.04 crore The above situation is applicable in the instant case also.

(h) Further, CEA and CWC were requested to certify the actual inflow data but vide letter dated 31.01.2017, they have expressed inability to certify the inflow series on year to year basis 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.*"

7. The matter was heard on 9.1.2019 and the Commission after hearing the parties admitted the petition. Earlier, the petitioner was directed to submit additional information vide technical validation letter dated 29.11.2018 as under:

(a) Rainfall data for the year 2016-17 reported by Indian Metrological Department for the district in which the plant is situated and for the adjoining districts.

(b) Planned and forced machine outage data certified by CEA/NRLDC and its correlation with energy generation data viz-a-viz available average inflows during the period of such outage.

8. In compliance with the above directions, the Petitioner has submitted the additional information vide affidavit dated 14.01.2019 and has served the copies of the same to the respondents.

Reply of UPPCL, Respondent No. 4

9. The Respondent No. 4, UPPCL vide its affidavit dated 24.05.2018, has submitted as under:

(a) The petitioner has demanded that the compensation for shortfall in generation has to be on rolling basis i.e. energy charges for 2017-18 = (Energy charges for 2017-18 – Loss in energy charges in 2017-18) + Loss in energy charges in 2016-17. Therefore, loss in energy charges in 2016-17 is proposed to

be carried forward in 2017-18.

(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 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

10. In response to the reply of the Respondent, UPPCL, NHPC vide its affidavit dated 14.08.2018 has submitted as under:

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

11. The Respondent BRPL vide its affidavit dated 07.01.2019 has submitted as under:

(a) The Petitioner in its petition has submitted that there was shortfall of 18.36 MU during the FY 2016-17 which are claimed to be beyond the control of the

Petitioner and this alleged shortfall in monetary terms is stated to be Rs. 6.13 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 and these are also liable to be rejected. 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. Accordingly, the alleged claim of the Petitioner is liable to be rejected by the Commission.

(d) The information supplied by Petitioner to claim the shortfall of 18.36 MU during the FY 2016-17 is not adequate. The Petitioner has filed the following information for this purpose;

a) *Provisional ABT based REA issued by NREB for all the 12 months during 2016-17;*

b) *Daily inflow data of the Petitioner in respect of Sewa-II power station for FY 2016-17;*

c) *Supplementary Bill dated 13-Feb.-2018 to the Deputy Chief Engineer, PSPCL Patiala-Punjab;*

d) *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 as requested by the NHPC to the Central Electricity Authority. Thus, the daily inflow series numbering 30 stands 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 above data of Petitioner has not been vetted by any independent authority. Also, the mandatory downstream release in cumecs is not prescribed. Yet, in the ultimate calculation, a provision of 1.15 cumecs towards mandatory downstream release on daily basis throughout the year has been taken indicating low flow and on the basis of this low flow, low generation have been presumed. This data also shows that during the month of August-2016, there have been huge spillage to the tune of 3475.739 cumecs and if this spillage was properly managed, it would have resulted in the generation of 8.74x31=270.94 MU as against the actual generation of 177.51 MU achieved by the Petitioner. Thus, it may be noted that the Petitioner has failed to utilize the reservoir capacity optimally by not resorting to extra generation during the month of August-2016 as well as the allowance of 1.15 cumecs towards mandatory downstream release on daily basis throughout the year. Nothing has been explained whether this shortfall is owing to planned or forced shutdown of the machinery during the shortfall period in energy generation. 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. Accordingly, the claim for lower actual energy generation compared to designed energy is liable to be rejected by the Commission.

(g) Further, the petitioner's plant had an excess of 6.62 MU beyond the scheduled energy (which includes free energy). Petitioner, NHPC would have sold this energy in the market resulting in revenue of approximately Rs. 1.97 crore to the power station. The computation is given as below:

MU generated	A	682.49
Normative Aux	B	1.20%
MU generated Net of Aux	C=A*(100%B)	674.30
MU scheduled by station	D	666.68
Unscheduled MU by the station	E=C-D	7.62
IEX prices of Northern region for FY16-17 (in Rs.)	F	2.58
Amount recovered for Unscheduled energy (Rs. Cr.)	G=E*F/10	1.97

Therefore, the Petitioner has already recovered the amount which it is claiming as a loss due to shortfall of energy generation.

(h) Besides the 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

12. In response to the reply of the Respondent BRPL, NHPC vide its affidavit dated 14.02.2019 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 Parbati-III Power Station in FY 2016-17, the total shortfall in generation was 18.91 MU and loss of energy charges was Rs. 6.31 crore. The Regulation 31(6)(a), 31(6)(b) & 31(6)(c) of the 2014 Tariff Regulations lays down the methodology for recovery of shortfall as applicable to generating stations.

(b) The understanding of the Respondent (BRPL) on recovery mechanism defined in clause 31(6) of the Tariff Regulations,2014 is not correct. There is no case of double benefit under this recovery mechanism. In fact, the Petitioner is recovering loss of energy charges of FY 2016-17 in next financial year i.e. FY 2017-18. The modification in Design Energy of FY 2017-18 for recovery of losses

in FY 2016-17 is as per procedure defined in regulation 31(6).

(c) The delay in submission of the Petition is due to time taken in compilation of data and its verification/ certification by external agencies like CEA/ CWC/ RLDC.

(d) As regards statement of BRPL that the data submitted by the Petitioner has not been vetted by any independent agency, it has already been stated that CEA/ CWC have denied certification of daily discharge data due to non-availability of discharge gauge at specific location.

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

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

ii. Similarly, in case of high siltation during monsoon season, the flushing of silt is necessary to maintain the pondage capacity of reservoir. In this process reservoir level is depleted after silt flushing process and the level is again maintained. In this process generation loss is there which is beyond the control of generating station.

(f) As per allocation letter issue by MoP, full power is allotted to different beneficiaries of Parbati-III Power Station except 13% free power to home state. In view of above, Parbati-III Power Station has no free power to be sold under market/exchange for recovery of additional revenue. The indicated generation (ex-bus) of 7.62 MU is unscheduled energy generated as per grid requirement under CERC (Deviation Settlement Mechanism and Related Matter) Regulation' 2014.

(g) 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. 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 power station, therefore, they have not been made respondent in the instant petition.

(h) It is also clarified that 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.

(i) 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 PSPCL, Respondent No. 1

13. The Respondent No. 1, PSPCL vide its affidavit dated 13.04.2019 has submitted as under:

(a) The Petitioner has claimed for recovery on account of shortfall in generation for 18.36 MU while stating that the same is on account of reasons which were beyond the control of the Petitioner. However, the Petitioner has not provided any details as to what were the reasons which were beyond the control of the Petitioner. Reasons given by the Petitioner for shortfall in generation such as high silt and less inflow from design inflow, are vague. The Petitioner has produced no documentary evidence for any of the aspects raised by it.

(b) With respect to the loss on account of silt flushing, it is submitted that as a hydropower generator, the Petitioner ought to have planned for such circumstances. Silt flushing is a foreseeable event which keeps on happening with hydropower projects and it cannot be considered as being beyond the control of the Petitioner. The Petitioner being a hydropower generator should know how to make arrangements in such circumstances. Therefore, the Petitioner ought not to be given any relief on account of reservoir flushing and high silt.

(c) The actual inflow cannot always be the same as the design inflow. On some days the actual inflow will be less and on some 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.

(d) The Petitioner has sought to make out a case that due to deviation of rainfall from the normal average, the water inflow was lesser and this has affected the generation. There is no merit in this submission and in fact the submission is contradictory to the rainfall data provided by the Petitioner. A mere comparison between the month wise rainfall data and the month wise shortfall/excess generation data shows how the Petitioner has tried to mislead the Commission. A table comparing the data extracted from the instant petition has been placed hereunder for the convenience of the Commission.

Month	**Rainfall** (millimetres)	% Departure of rainfall from the long period averages of rainfall	**Shortfall/Excess (MU)**
Jan. 2016	37.9	-56	
Feb. 2016	74.1	-24	
Mar. 2016	186.6	38	
April 2016	92.5	16	-12.63
May 2016	57.5	-20	2.24
June 2016	58.6	-29	-14.37
July 2016	185.9	1	-29.38
Aug. 2016	282.6	70	60.70
Sep. 2016	36.4	-58	5.05
Oct. 2016	4.9	-85	-2.82
Nov. 2016	0.0	-100	-5.74
Dec. 2016	0.1	-99	-5.58
Jan. 2017			-4.89
Feb. 2017			-2.10
Mar. 2017			-9.40

(e) It can be seen from the above table that even in the months where there is sufficient rainfall, the Petitioner has stated that there has been less inflow of water. For instance in the months of April and July, 2016 while the deviation percentage of rainfall is positive, the Petitioner has claimed for shortfall due to less inflow. Whereas in the months of May and September 2016, where the rainfall is actually less and the percentage departure is negative, the Petitioner has stated that there has been excess generation. If there is high rainfall in a

month and the percentage departure is positive, then the inflow in that month will also be high. However, the data provided by the Petitioner contradicts the Petitioner's case. Further, while the Petitioner has claimed for shortfall in generation up to the Month of March 2017, the rainfall data has only been provided till December 2016. The Petitioner has no basis to claim for recovery of shortfall on account of less inflow.

(f) The Petitioner has placed on record the letter dated 23.01.2017 of the Central Water Commission ("CWC"), [Pages 84-85 of petition], whereby CWC has expressed its inability to certify the inflow series on year to year basis. Therefore, the 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

14. In response to the reply of Respondent PSPCL, NHPC vide its affidavit dated 18.06.2019 has submitted as under:

(a) The seasonal variation in hydrology as indicated by respondent is correct. In instant case, also 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 in present case. The petitioner has lost 107.26 MU in some months, whereas 104.13 MU extra energy is generated in some months. Hence, petitioner has claimed only 3.13 MU on account of less inflow.

(b) Silt flushing is a seasonal requirement in hydro power station during monsoon season. Requirement of silt flushing depends on silt content in the water and it cannot be ascertained. Regarding generation as compared to design energy, it is submitted that design energy is determined on the basis of discharge in 90% dependable year with 95% machine availability. The Design Energy is not directly linked with design of project structure for spillage or de-silting arrangement.

(c) The Respondent has correlated the rainfall in the district Kullu where the project is located. Parbati-III Power Station is located on Sainj River. The river is originating from Himalayan glaciers and in Himalayan Rivers main source of discharge are water originating from melting of ice. In view of above, there is no direct correlation between the rainfall in the district and discharges in the river.

(d) 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

15. As stated at para 5 above, the Design Energy of the instant generating station is considered as 701.40 MU for calculation of shortfall in energy generation. During the FY 2016-17, there was a shortfall of 18.91 MU in generation from the instant generating station. Of this shortfall, the Petitioner has claimed that 18.36 MU was beyond its control while balance of 0.55 MU has not been claimed by the Petitioner. The Petitioner has invoked provisions of Regulation 31(6)(a) of the 2014 Tariff Regulations to claim of relief for the shortfall of 18.36 MU.

16. The break-up of unclaimed loss (0.55 MU) by the Petitioner is as under:

(a) Additional energy generated by depleting reservoir level: 11.66 MU
(b) Shortfall in generation for increasing reservoir level (-) 11.54 MU
(c) Other constraints (Partial Load/ramping up, down during peaking): (-) 0.67 MU

17. The break-up of claimed loss (18.36 MU) by the Petitioner on account of uncontrollable factors is as under:

(a) Energy shortfall due to less inflow: (-) 107.26 MU
(b) Energy gain due to excess inflow: 104.13 MU
(c) Energy shortfall due to silt flushing: (-) 15.23 MU

18. 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 not as per 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 the order dated 11.12.2013 related to prayer for reduction in NAPAF, while present petition is for relief on account of shortfall in generation on account of uncontrollable factors and, therefore, is covered under provisions of Regulation 31(6)(a) of the 2014, Tariff Regulations.

19. Respondents have raised the issue 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. The Petitioner has stated that there is no case of double benefit and the claimed relief is covered under provisions of the 2014 Tariff Regulations. The issue raised by the Respondents in effect challenges to the provisions of the Regulations itself, which cannot be dealt with through this Petition.

20. Respondents have pointed out that the Petitioner has not been able to utilise the full potential of the inflows during August 2016 as there was lot of spillage as observed from the 365 days data as submitted by the Petitioner. In the instant case, as per technical parameters, whenever the inflows are more than the design inflow i.e. 177 cumecs, spillage is bound to occur. From the scrutiny of the 365 days data as submitted by the Petitioner, it is noticed that there were 7 days when Spillage has occurred and out of these 7 days, spillage due to high silt was on 3 days. On other 4 days, spillage was due to machine outages & other constraints and Petitioner has accounted shortfall in energy generation due to these reasons as being under its

control. The contention of the Respondents 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, is relevant for these four days only. However, the Petitioner has accounted the shortfall due to machine outages and other constraints under the reasons within its control. As such, it cannot be held that the energy has not been generated corresponding to inflows.

21. Some of the Respondents have submitted that the data submitted by the Petitioner has not been verified by any independent agency. In this regard, it is to point out that there is no provision in the Tariff Regulations,2014 for vetting of the inflow data by independent agency. Commission in this regard is guided by the rainfall data, which is one of the indicators of inflows, spillage data, machine outage data etc. to verify the claim of the petitioner. Therefore, further analysis has been carried in the following paragraphs to ascertain reasonability of the claim of the Petitioner.

22. 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.

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

(i) <u>Low inflows in comparison to the design inflows associated with design year.</u>

23. It is observed that petitioner has claimed energy short-fall of 3.13 MU [107.26 MU – 104.13 MU as at paragraph 17] only on account of variation in inflows as compared to the design year inflows. The Petitioner was directed to submit IMD rainfall data to correlate low inflows with energy generation vide ROP of hearing dated 11.01.2019. 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 31.01.2017 where CWC had categorically mentioned its inability to certify the inflow data in respect of the generating station of the Petitioner. Thus, in absence of certified data by CEA/ CWC, reliance has to be placed upon the IMD data for the year 2016-17 and prudence of the outages data (planned and forced) to verify that outages were not the reason of energy shortfall .

24. The rainfall data issued by the Indian Metrological Department (IMD) in respect of Kullu district for the years 2016 and 2017 is given below:

The District Rainfall, in millimeters (R/F) are the arithmetic averages of Rainfall of Stations under the District.

(mm)

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2016	37.9	74.1	186.6	92.5	57.5	58.6	185.9	282.6	36.4	4.9	0.0	0.1
2017	186.8	77.6	106.9	109.2	96.5	146.1	218.9	106.2	106.4	1.0	19.0	44.9

% deviation of rainfall from the long period averages of rainfall for the district is as under:

(%)

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2016	-56	-24	38	16	-20	-29	1	70	-58	-85	-100	-99
2017	115	-20	-21	37	34	77	18	-36	23	-97	-19	6

25. As per India Meteorological Department (IMD), which is the central agency that records and archives rainfall data in India, the following is noted.

> *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.

26. Correlating the above tabulated rainfall data as per IMD reports, indicates low rainfall in comparison to long period averages. PSPCL has pointed out that for certain months for example, April 2016 and July 2016 when there is sufficient rainfall, Petitioner has claimed that there was less inflow of water and vice versa. Petitioner in its reply has submitted that, "*the Respondent has correlated the rainfall in the district Kullu where the project is located. Parbati-III Power Station is located on Sainj River. The river is originating from Himalayan glaciers and in Himalayan Rivers main source of discharge are water originating from melting of ice. In view of above, there is no direct correlation between the rainfall in the district and discharges in the river"*.

27. In this regard, it is to point out that IMD rainfall data is just one of the indicators to correlate the energy generation with inflows. Apart from rainfall, for snow fed rivers, rate of melting of ice during certain months may also alter the inflows considerably as compared to design inflows. In the instant case, shortfall in energy generation due to inflows is to the tune of only 3.13 MU on overall basis for the year 2016-17, based on the actual inflow data submitted by the petitioner.

(ii) <u>Prolonged planned/ forced outage of machines</u>

28. 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 technical validation letter dated 29.11.2018 had directed the Petitioner to furnish the planned and forced outage data for the year 2016-17 along with its correlation with energy generation. In response, the Petitioner vide affidavit dated 09.01.2019 has submitted details of 292 events of forced outages and planned outages during the year 2016-17. The breakup of the same is as under:

Events	Design Energy (MU)	Spillage (Cumecs)	Maximum possible generation based on actual inflow available (MU)	Actual Generation at GT (MU)	Energy shortfall (MU)	Claimed under the head:- Shortfall Beyond control of Power Station	Claimed under the head:- Shortfall Within control of Power Station	Reasons
238	373.55	0.00	278.61	279.81	-93.74	-94.95	1.20	-94.74 MU claimed by the petitioner for reason of less inflow from design inflow.
52	146.26	0.00	185.35	188.84	42.58	39.09	3.50	39.09 MU Excess inflow from design inflow has been adjusted in the shortfall claimed.
2	7.90	42.46	10.37	6.76	-1.10	2.50	-3.61	There was spillage of water and -3.61 MU of energy was on account of reasons within control of the generating station due to unit outage.

29. From the above data, we note that out of these 292 outages as reported by the Petitioner, during 238 outages, the inflows were less than the corresponding design energy inflows. During these instances of lower inflows, the maximum possible generation from available inflows was 278.61 MU as against design energy of 373.55 MU and the actual generation was 279.81 MU. As such, petitioner was able to generate to full potential of available inflows and the outages did not have any impact on energy generation. The shortfall of (-)94.95 MU during these 238 instances was solely attributable to less inflows which was not under the control of the petitioner and same is included in the shortfall of (-)107.26 MU claimed by the petitioner as indicated at para 17 (c) above.

30. During 52 instances of outages, the inflows were more than the corresponding design energy inflows. We note that there was no shortfall with respect to design energy with respect to the maximum possible generation.

31. There are 2 instances i.e. on 24.08.2016 & 30.08.2016, when there was energy generation shortfall of (-)3.61 MU due to machine outages and spillage. The petitioner has accounted this shortfall of (-) 3.61 MU under the head "Shortfall within control of Power Station" and same is included in the shortfall of of (-)11.54 MU claimed by the petitioner as indicated at para 17 (c) above.

32. In view of this, the shortfall of (-) 3.61 MU was due to machine outages and petitioner has accounted this shortfall under its control and the same will be used for further calculations in this Order.

33. Thus, we find that outages were not the reason for the energy shortfall claimed by the petitioner beyond its control.

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

34. In order to assess maximum possible annual generation with available actual inflows as submitted by the Petitioner, calculations have been made by using following formulae:

Maximum Possible Generation (MU) = (520*0.024/177)* Actual Inflow

Where 520 MW is the capacity of the plant and 177 cumecs is the corresponding design discharge of all four units of the plant.

35. As per this calculation, maximum possible generation should have been 683.28 MU. However, the Petitioner in its calculations has assessed the same to be 698.32

MU. The figure of 698.32 MU as stated by the Petitioner is being adopted for further analysis.

36. Based on the above calculations and after accounting for the reasons of shortfalls which were beyond the control of the Petitioner and the reasons which the Petitioner has attributed to itself, following has been worked out to assess the possible generation at generator terminal against the actual generation of 682.49 MU:

a) In our view stoppage and the consequent loss of energy to prevent the damage due to high silt level is beyond the control of the generator. Further, considering the fact that the calculation of Design Energy of the plant based on the hydrological series does not take into account the energy lost due to stoppage of plant due to high silt levels, we are of the view that the generator needs to be compensated for that. Possible generation assessed at generator terminal after accounting for the reasons beyond the control of the petitioner:

(In MU)

1.	Energy that could have been generated by utilizing available actual inflows and 100% machine capacity i.e. 520 MW as submitted by the petitioner (MU)	698.32
2.	Energy lost due to plant stoppage due to Silt (MU)	(-)15.23
3.	Remaining Energy that could be generated (MU)	683.09

b) The Petitioner has stated that 0.55 MU was not uncontrollable. Thus, the possible energy generation assessed at generator terminal after accounting for the reasons within the control of the Petitioner as claimed by the Petitioner: = 683.09 MU - 0.55 MU = 682.54 MU.

37. In view of the above calculations, it is held that the Petitioner could have generated 682.54 MU as against actual generation of 682.49 MU. Accordingly, the figure of 682.54 MU is being adopted for further analysis.

38. In light of above deliberations, Commission is of the view that the Petitioner is entitled to be compensated to the extent of energy shortfall occurred due to reasons which were not under the control of the Petitioner, which works out to 18.31 MU (701.40 MU – 682.54 MU - 0.55 MU) i.e. the difference between Design Energy and

the maximum possible generation after accounting for the reasons of shortfall beyond the control of the Petitioner. Here, 0.55 MU is the shortfall that has not been claimed by the Petitioner.

39. Respondent BRPL has submitted that the generating station had an excess of 7.62 MU beyond scheduled energy and Petitioner NHPC would have sold this energy in the market resulting in revenue to the power station (approx. Rs. 1.97 crore). In our view, the stated energy of 7.62 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 Parbati-III Power Station (except free power to Home State). Thus, Parbati-III Power Station has no free power to be sold in power exchange for recovery of additional revenue. This energy generated above the scheduled energy is accounted for in the DSM and is governed by provisions of DSM Regulations, 2014.

40. The Commission vide order dated 23.04.2019 in petition no. 6/GT/2017 has allowed AFC of Rs. 532.89 crore for the period 2016-17 and Design Energy of 1963.29 MU instead of 701.40 MU approved earlier vide order dated 25.6.2014. However, the petitioner has agreed for recovery of Energy Charges by considering Design Energy of 1963.29 MU. As stated at para 5 above, any shortfall in energy generation is being compared with ‘respect to D.E. of 701.40 MU while energy charge rate is being considered based on Design Energy of 1963.29 MU i.e. 1.579 Rs./KWh {532.89/(2x1963.29x0.87x0.988)x10}. Accordingly, Energy charges to be recovered by the generating stations works out to be as given below:

Annual Fixed Charges allowed in order dated 23.04.2019 in petition no. 6/GT/2017 (Rs.crore)	Energy Charges to be recovered as per order dated 23.04.2019 in petition no. 6/GT/2017 (Rs.crore)	Energy Charges to be recovered as agreed by the petitioner based on design energy of 701.40 MU and ECR based on Design Energy of 1963.29 MU (Rs. crore)
1	**2=50% of 1**	**3=266.45x701.40/1963.29**
532.89	266.45	95.19

41. Therefore, the amount to be recovered in the FY 2017-18 due to shortfall in energy generation from the Design Energy during 2016-17 and amount to be recovered for 579.74 MU [Net energy billed as per paragraph 6 (e)] during 2016-17 based on above ECR of 1.579 Rs./KWh works out as follows:

Energy Charges to be recovered during 2016-17 (Rs. crore)	Energy Charges to be recovered for 579.74 MU of Net Energy Billed during 2016-17 (Rs. crore)	Shortfall in energy charges recovery (Rs. crore)	Energy Charges already recovered during 2016-17 (Rs. crore)
95.19	**91.54**	**3.65**	**158.73**

42. Therefore, the amount to be recovered in the FY 2017-18 due to shortfall of 18.31 MU (as at paragraph 38) energy generation from the Design Energy during 2016-17 which was beyond the control of the Petitioner as allowed in this order works out as follows:

Total Shortfall in generation during FY 2016-17 (MU)	A	18.91
Total under recovery of energy charges during FY 2016-17 (Rs. crore)	B	3.65
Shortfall in generation due to reasons beyond control (MU)	C	18.31 MU
Shortfall in energy charges to be recovered during FY 2017-18 (Rs. crore)	D=C*B/A	3.53

43. It can be seen from above that, the Petitioner based on Annual Fixed Charge and Design Energy as allowed by the Commission vide interim order dated 25.6.2014 and final order dated 28.03.2016 has recovered energy charges of Rs.158.73 crore, in excess as compared to energy charges allowed of Rs.95.19 crore based on Annual Fixed Charge and Design Energy allowed by the Commission vide order dated

23.04.2019. Accordingly, the Petitioner is directed to revise its billing based on order dated 23.04.2019. Petitioner is allowed to recover energy charge shortfall of Rs. 3.53 crore (as at paragraph 42) for the year 2016-17 by revising the Design Energy for the year 2017-18 to actual generation for 2016-17 of 682.49 MU till the recovery of shortfall. Further, the difference in energy charge for the year 2016-17, which may arise after the true-up of tariff for the period 2014-19 shall be adjusted with the beneficiaries directly by the petitioner through supplementary bills after true-up for 2014-19 period.

44. Petition No. 142/MP/2018 is disposed of in terms of above.

Sd/-	**Sd/-**	**Sd/-**
(I S Jha)	**(Dr. M.K. Iyer)**	**(P. K. Pujari)**
Member	**Member**	**Chairperson**