

**Central Electricity Regulatory Commission
New Delhi**

Petition No.143/MP/2018

Coram:

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

Date of Order: 17.09.2019

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

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 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 Rs. 13.06 Crs in FY 2017-18 against the shortfall in generation of 60.50 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 of the petition.*

(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. 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 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 billing 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:

$(\text{Energy charge rate in Rs. / kWh}) \times \{\text{Scheduled energy (ex-bus) for the month in kWh}\} \times (100 - \text{FEHS}) / 100$

“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):

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

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 from 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 $100 / (100 - \text{AUX})$.

“31(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 $\{\text{DE} \times (100 - \text{AUX}) \times (100 - \text{FEHS}) / 10000\}$

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 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. 1	Month 2	Design Energy (MU) 3	Actual energy at GT (MU) 4	Shortfall/Excess 5=4-3	Actual PAF (%) 6
1	Apr-16	55.93	58.55	2.62	104.38
2	May-16	39.01	43.55	4.54	104.38
3	Jun-16	81.92	26.80	-55.12	104.38
4	Jul-16	76.69	34.71	-41.99	104.38
5	Aug-16	84.82	77.00	-7.82	100.43
6	Sep-16	40.90	35.00	-5.90	104.35
7	Oct-16	21.36	11.00	-10.36	101.84
8	Nov-16	14.66	8.17	-6.49	86.39
9	Dec-16	11.70	6.51	-5.19	67.39
10	Jan-17	9.72	25.11	15.39	91.72
11	Feb-17	22.61	71.48	48.87	104.38
12	Mar-17	74.21	72.68	-1.53	104.38
Total		533.53	470.55	-62.98	

(b) Based on the daily inflow, design inflow data submitted by the petitioner maximum possible generation for the year 2016-17 is 475.20 MU.

(c) The total shortfall in generation during 2016-17 is 62.98 MU (533.53 MU – 470.55 MU).

(d) Out of the total shortfall of 62.98 MU, shortfall of 60.50 MU was beyond the control of Petitioner while balance shortfall of 2.48 MU was not uncontrollable. Hence, as per Regulation 31(6)(a) of the 2014 Tariff Regulations, the shortfall of 60.50 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 from design inflow	-148.05 MU
Energy shortfall due to excess inflow from design inflow	89.72 MU
Silt flushing	-2.17 MU
Total (A)	-60.50 MU
B. Shortfall due to reasons within the control of petitioner	
Energy generated by depleting reservoir (grid requirements)	35.49 MU
Less generation for increasing reservoir (grid requirements)	-34.43 MU
Other constraints (Partial load/ ramping up, down during peaking)	-3.54 MU
Total (B)	-2.48 MU
Grand total (A+B)	-62.98 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 2010-14 vide interim tariff order dated 06.09.2010 and its subsequent amendment dated 22.09.2010 in petition no. 57/2010 and is detailed as under:

Schedule Energy (Ex-Bus) (MU)	Free Energy (MU)	Net Energy Billed (MU)	ECR (Rs/Unit)	Annual Fixed Charges (crore)	Energy Charges to be recovered (crore)	Energy Charges actually recovered (crore)	Under recovery of Energy (crore)
1	2	3=1-2	4	5	6=50% of 5	7=3*4/10	8=7-6
457.40	60.69	396.71	2.164	198.90	99.45	85.85	-13.60

(f) As out of the total loss of 62.98 MU, the loss of 2.48 MU was within the control of the petitioner, the petitioner has requested to allow shortfall of energy charges amounting to Rs. 13.06 Crs corresponding to 60.50 MU only, which was due to reasons beyond the control of the petitioner. Details are as under:

Total Shortfall in generation during FY 2016-17	A	62.98 MU
Total under recovery of energy charges during FY 2016-17	B	13.60 Crs
Shortfall in generation due to reasons beyond control	D	60.50 MU
Shortfall in energy charges to be recovered during FY 2017-18	E=D*B/A	13.06 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.”

5. 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 vizaviz available average inflows during the period of such outage.*

6. 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

7. 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

8. 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 Raidhani Power Limited (BRPL)

9. The Respondent BRPL vide its affidavit dated 31.01.2019 has submitted as under:

(a) The Petitioner in its petition has submitted that there was shortfall of 60.50 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. 13.06 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 60.50 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) *Energy 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 as not 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. This data also shows that the main shortfall is in the months of June-2016, July-2016, August-2016, September-2016, October-2016, November-2016, December-2016 and March-2017. There is no explanation as to whether this shortfall is owing 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 July-2016, August-2016 and January-2017. Further, in the month of June-2016 and August-2016 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 alongwith 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 7.50 MU beyond the scheduled Energy (Scheduled energy includes free energy). Petitioner NHPC would have sold this energy in the market resulting in revenue of approximately Rs. 1.94 Cr to the power station. The computation is as given below:

MU Generated	A	470.55
Normative Aux	B	1.20%
MU Generated Net of Aux	$C = A * (100\% - B)$	464.90
MU Scheduled by Station	D	457.4
Un Scheduled (MU) by Station	$E = C - D$	7.50
IEX prices (Rs) of Northen Region for FY 15-16	F	2.58
Amt Recoverd for Unscheduled energy Rs Cr.	$G = E * F / 10$	1.94

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

10. In response to the reply of 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 Sewa-II Power Station in FY 2016-17, the total shortfall in generation was 62.98 MU and loss of energy charges was Rs. 13.60 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 2014 Tariff Regulations 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 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 Sewa-II Power Station except 12% free power to home state. In view of above, Sewa-III Power Station has no free power to be sold under market/ exchange for recovery of additional revenue. The indicated generation (ex-bus) of 7.5 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. 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 power station and, therefore, are not 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

11. The Respondent No. 1, PSPCL vide its affidavit dated 12.04.2019 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 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) The Petitioner has stated that the energy loss due to silt flushing is an uncontrollable event and the loss of energy due to this is recoverable from the beneficiaries. It is submitted that as a hydro power generator, the Petitioner ought to have planned for such a situation. Silt flushing is a foreseeable event which keeps on happening with hydro power projects. Therefore, the same cannot be considered as being beyond the control of the Petitioner. The Petitioner being a hydro power generator, should know how to make arrangements in such circumstances. The Petitioner ought not to be given any relief on account of silt flushing.

(c) 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. In so far as the aspect of less in flow is concerned, it is submitted that this 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.

(d) The Petitioner has placed on record the letter dated 23.01.2017 of the Central Water Commission ("CWC"), [Pages 95-96 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

12. 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 148.05 MU in some months, whereas 89.72 MU extra energy is generated in some months. Hence, petitioner has claimed only 58.33 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 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

13. We note that the Design Energy of the instant generating station is 533.53 MU. During the FY 2016-17, there was a shortfall of 62.98 MU in generation from the instant generating station. Of this shortfall, the Petitioner has claimed that 60.50 MU

was beyond its control while balance of 2.48 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 relief for the shortfall of 60.50 MU.

14. The break-up of unclaimed loss (2.48 MU) by the Petitioner is as under:

- (a) Additional energy generated by depleting reservoir (grid requirements):
35.49 MU
- (b) Shortfall in generation for increasing reservoir (grid requirements):
(-) 34.43 MU
- (c) Other constraints (Partial Load/ramping up, down during peaking):
(-) 3.54 MU

15. The break-up of claimed loss (60.50 MU) by the Petitioner on account of uncontrollable factors is as under:

- (a) Energy shortfall due to less inflow: (-) 148.05 MU
- (b) Energy gain due to excess inflow: 89.72 MU
- (c) Energy shortfall due to silt flushing: (-) 2.17 MU

16. 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 that 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 is covered under provisions of Regulation 31(6)(a) of the 2014 Tariff Regulations.

17. 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 issues raised by the Respondents in effect relate to the provisions of the Regulations itself, which cannot be dealt with through this Petition.

18. Respondents have pointed out that the Petitioner has not been able to utilise the full potential of the inflows, especially during June-August 2016 as there was lot of spillage as observed from the 365 days data as submitted by the Petitioner in the main petition. 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 i.e. 24.25 cumecs, spillage is bound to occur. The full potential of the incoming flows (if less than 24.25 cumecs) need to be utilized by the generating station without spillage. 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 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.

19. Some of the Respondents have submitted that the data submitted by the Petitioner has not been verified by any independent agency. Therefore, further analysis has been carried 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.

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

21. The Petitioner was directed to submit IMD rainfall data to correlate low inflows 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, to ascertain the fact that prolonged outages (planned or forced) were not the reason of low generation in comparison to Design Energy:

22. The rainfall data issued by the Indian Metrological Department (IMD) in respect of Kathua 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.

(in mm)

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2016	5.4	8.6	114.9	7.6	24.2	173.5	326.6	309.3	118.4	5.2	0.0	0.0
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

% deviation of rainfall from the long period averages of rainfall for the district.

Year	(%)											
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2016	-94	-85	153	-62	94	178	-16	-23	-7	-82	-100	-100
2017	55	-41	-11	121	98	132	-13	40	-55	-100	-94	260

23. 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.

24. Correlating the above tabulated rainfall data as per IMD reports, indicates low rainfall in comparison to long period averages.

(ii) Prolonged planned/ forced outage of machines

25. 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 14.01.2019 has submitted that there have been 57 instances of planned outages and forced outages during the year 2016-17. We note that out of these 57 outages as reported by the Petitioner, 46 instances pertain to the months of November

2016, December 2016 and January 2017 during which the plant was under planned shutdown for carrying Annual Maintenance. Further, it is noticed that 11 incidences of forced outage was due to problem in excitation system, problem in software of DPU of EHGC, transmission line constraints, other constraints, etc. 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 57 cases are summarized as under:

a) For the 11 instances of forced outages the actual generation was 18.67 MU in comparison to design energy of 26.67 MU. Maximum energy potential of the actual inflows for this period has been worked out as 18.43 MU. However, the Petitioner in its calculations has assessed the same to be 20.47 MU. This difference is due to different methodology adopted by the petitioner for arriving at maximum possible generation. As such, forced outage of few machine hours during these days has resulted in shortfall of 1.80 MU in comparison to the maximum potential of the actual inflows as submitted by the petitioner. It is observed that the Petitioner has put this shortfall under the list of “energy shortfall due to reasons within the control of the petitioner”.

b) For the remaining 46 instances during which the plant was under planned shutdown for carrying Annual Maintenance, the actual generation was 9.68 MU in comparison to design energy of 18.6 MU. The maximum energy potential of the actual inflows for this period has been worked out as 8.43 MU. However, the Petitioner in its calculations has assessed the same to be 10.12 MU. This difference is due to different methodology adopted by the petitioner for arriving at maximum possible generation. As such, forced outage of few machine hours during these days has resulted in shortfall of 0.44 MU in comparison to the maximum potential of the actual inflows as submitted by the petitioner. It is observed that the Petitioner has put this shortfall under the list of “energy shortfall due to reasons within the control of the petitioner”.

26. The final position with respect to planned outages of the plant:

	Design Energy (MU) (a)	Maximum possible generation at GT with available inflows without outages and with use of installed capacity during high inflow period (MU) (b)	Actual Generation (MU) (c)	Shortfall w.r.t to DE (d)=(c)-(a)	Shortfall w.r.t to maximum possible generation (e)=(c)-(b) (MU)
57 instances of planned outage	45.26	30.59	28.35	(-)16.91	-2.24

27. We note that the Petitioner has put the above shortfall of (-) 2.24 MU as attributable to it due to forced/ planned outage under the list of “energy shortfall due to reasons within the control of the petitioner” and the same is included in total energy shortfall of (-)37.97 MU as detailed at para 14 above (-34.43 MU for Less generation for increasing reservoir and -3.54 MU for Other constraints).

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

28. In order to assess maximum possible annual generation with available actual inflows as submitted by the Petitioner, calculations have been made considering the available actual inflows. As per this calculation, maximum possible generation utilising 100% machine capability should have been **457.33 MU**. For this purpose, the plant capacity of 120 MW, design head of 560 M, overall efficiency of 90% and design flow of 24.25 cumecs have been considered in line with the values used to arrive at the Design Energy. However, the Petitioner in its calculations has assessed the same to be 475.20 MU. This difference is due to different methodology adopted by the petitioner for arriving at maximum possible generation. The figure of 475.20 MU as calculated by the petitioner being on higher side is being adopted for further analysis.

29. 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 470.55 MU:

a) Possible generation assessed at generator terminal after accounting for the generation loss due to reasons beyond the control of the petitioner:

1.	Energy that could have been generated by utilizing available actual inflows and 100% machine capacity i.e. 231 MW as submitted by the petitioner	475.20 MU
2.	Energy lost due to due to Silt	2.17(MU)
3.	Remaining Energy that could be generated	473.03 (MU)

In our view, stoppage and 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.

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

Sl. No		Based on actual available flow at 100% machine capacity
1.	Remaining Energy that could be generated after taking into account reasons beyond control (MU)	473.03
2.	Excess generation due to grid requirements	1.06
3.	Other constraints (Partial load/ ramping up, down during peaking)	-3.54
	Remaining Energy that could be generated (MU)	470.55

30. In view of the above calculations and the fact that actual generation of the generating station was 470.55 MU is in agreement with the assessed possible generation, it is held that 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. In our view, lower generation in comparison to Design Energy was due to reasons not under the control of the petitioner i.e. low inflows, energy lost due plant stoppage during incidence of high silt and other stated reasons i.e. energy loss due to Unit outages, energy loss due to grid requirements, other constraints (partial ramping up/ down during peaking) for which the Petitioner has taken the responsibility by putting them under the list of reasons within the control.

31. 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 60.50 MU (533.53 – 473.03) 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.

32. Respondent BRPL has submitted that the generating station had an excess of 7.50 MU beyond scheduled energy and Petitioner NHPC would have sold this energy in the market resulting in revenue to the power station (approx. Rs. 1.94 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 12% 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. This energy generated above the scheduled energy is accounted for in the DSM and is governed by provisions of DSM Regulations, 2014.

33. Thus, the energy charge shortfall is worked out as follows:

Schedule Energy (Ex-Bus) (MU)	Free Energy (MU)	Net Energy Billed (MU)	ECR (Rs/Unit)	Annual Fixed Charges (Rs. crore)	Energy Charges to be recovered (Rs. crore)	Energy Charges actually recovered (Rs.crore)	Under recovery of Energy (Rs.crore)
1	2	3=1-2	4	5	6=50% of 5	7=3*4/10	8=7-6
457.40	60.69	396.71	2.164	198.90	99.45	85.85	-13.60

34. Therefore, the amount to be recovered in the FY 2017-18 due to shortfall in energy generation from the Design Energy during 2016-17 works out as follows:

Total Shortfall in generation during FY 2016-17	A	62.98MU
Total under recovery of energy charges during FY 2016-17 (Rs. crore)	B	13.60
Shortfall in generation due to reasons beyond control	C	60.50 MU
Shortfall in energy charges to be recovered during FY 2017-18 (Rs. crore)	D=C*B/A	13.06

35. Accordingly, in terms of Regulation 31(6)(a) and 31(6)(c) of the 2014 Tariff Regulations, we decide that the Design Energy for the year 2017-18 is 470.55 MU till the energy charge shortfall of Rs. 13.06 Crore for the period 2016-17 is recovered by the petitioner by revision of energy bills for the period 2017-18. Further, the difference in energy charge shortfall to be recovered for the year 2016-17 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.

36. Petition No.143/MP/2018 is disposed of in terms of above.

Sd/-
(I S Jha)
Member

Sd/-
(Dr. M.K. Iyer)
Member

Sd/-
(P. K. Pujari)
Chairperson