

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
New Delhi**

**Petition No.133/MP/2022**

**Coram:**

**Shri I.S. Jha, Member**

**Shri Arun Goyal, Member**

**Shri P.K. Singh, Member**

**Date of Order: 31.08.2023**

**In the matter of**

Petition under Regulation 44(6) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 for recoupment of under-recovered energy charges due to shortfall in energy generation for reasons beyond the control of generating station during FY 2019-20 & 2020-21 in respect of Chutak Power Station.

**And**

**In the matter of**

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

.....**Petitioner**

**Vs**

1. The Principal Secretary to Govt. of J&K,  
Power Development Department,  
Civil Secretariat, Srinagar, J&K.

.....**Respondent**

**Parties Present:**

Shri Rajiv Shankar Divedi, Advocate, NHPC  
Shri S.K. Meena, NHPC



## **ORDER**

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

- a) *Hon'ble Commission may kindly allow recovery of energy charges amounting to Rs 5.25 Crs against the shortfall in generation of 15.02 MU in FY 2019-20 as per regulation 44(6) of CERC Tariff Regulations, 2019 as explained in para-VIII & XI.*
- b) *Hon'ble Commission may kindly allow recovery of energy charges amounting to Rs 18.60 Crs against the shortfall in generation of 50.39 MU in FY 2020-21 as per regulation 44(6) of CERC Tariff Regulations, 2019 as explained in para-IX & XII.*
- c) *Hon'ble Commission is requested to allow recovery of shortfall in energy charges amounting along with interest as explained in para-XIII.*
- d) *To allow revision of energy bills for the period 2019-20 & 2020-21 which were already raised to beneficiary(ies) for recovery of energy charges to be allowed by the Hon'ble Commission in this petition.*
- e) *To allow issuance of supplementary bill for recovery of balance shortfall in energy charges directly from beneficiaries after determination of final tariff / truing up tariff by Hon'ble Commission as mentioned in prayer 1 to 3.*
- f) *Pass such other and further order / orders as are deemed fit and proper in the facts and circumstances of the case.*

### **Submission of the Petitioner**

2. NHPC Limited, hereinafter called 'NHPC', is a Government of India Company within the meaning of the Companies Act, 1956. Further, it is a 'Generating Company' as defined under Section 2(28) of the Electricity Act, 2003.
3. The Chutak Power Station (hereinafter called 'Chutak power station') (3 x 11 = 44 MW) located in the UT of Ladakh is under commercial operation w.e.f. 29.11.2012.
4. The power generated from this Power Station is being supplied to Power Development Department of J&K.



5. The approved annual design energy (DE) of Chutak Power Station is 212.93 MU and after accounting for actual auxiliary consumption (i.e. 3.4% for FY 2019-20 and 2.7% for FY 2020-21), 1% towards LADF and 12% as free power to home state, the saleable design energy works out to 179.02 MU for FY 2019-20 and 180.25 MU for FY 2020-21. Normative auxiliary consumption is fixed by CERC as 5% vide order dated 23.02.2022 in Petition no.283/GT/2020.

6. Regulation 44(6) of CERC (Terms and Conditions of Tariff) Regulations, 2019 provide for recovery of shortfall in energy charges for the reasons beyond the control of generating station during the tariff period 2019-24.

7. Hence, as per Regulation 44(7) of CERC Tariff Regulations, 2019, the shortfall in energy charge for FY 2019-20 & 2020-21 needs to be recovered in six (6) equal monthly installments, after issue of order by CERC in this matter.

8. In the FY 2019-20, saleable scheduled energy including deemed energy is 164 MU and saleable design energy is 179.02 MU. As such there is a total shortfall of 15.02 MU (179.02 MU – 164 MU) in generation during 2019-20.

9. In the FY 2020-21, saleable scheduled energy is 133.63 MU and saleable design energy is 180.25 MU. As such there is a total shortfall of 46.62 MU (180.25 MU – 133.63 MU) in generation during 2020-21.

10. The petitioner had filed tariff petition No.283/GT/2020 for truing up of AFC for 2014-19 and for determination of tariff for the period 2019-24 based on projected capital expenditure. In this petition order has been issued by CERC on 23.02.2022. Accordingly,



billing is being done with AFC approved by CERC vide order dated 23.02.2022 in petition No.283/GT/2020. The Petitioner has submitted that its claim in the present petition, for recovery of energy charges is based on interim tariff allowed by the Commission for FY 2019-24 vide order dated 23.02.2022, which is subject to change on outcome after truing-up. Accordingly, the Petitioner has recovered energy charges amounting to ₹71.65 Crs. & ₹58.68 Crs corresponding to saleable scheduled energy of 163.99 MU & 133.64 MU against energy charges of ₹76.89 Crs and ₹77.28 Crs for FY 2019-20 & 2020-21 respectively. Hence, there is under-recovery of energy charges of ₹5.25 Crs & ₹18.60 Crs for FY 2019-20 & 2020-21 respectively and the same has been claimed by the petitioner.

11. The Petitioner has further submitted that once, the recovery for energy charges is allowed by the Commission, the shortfall in energy charges will be recovered in six (6) equal monthly installments as per Regulation 44(7) of CERC Tariff Regulations, 2019. However, subsequent to issuance of final tariff order for the tariff period 2019-24, the Petitioner will raise supplementary bill for recovery of shortfall on the basis of revised energy charge.

12. Further, CERC Tariff Regulations, 2019 provides for adjustment of tariff with interest at the bank rate (i.e. SBI plus 350 basis point) prevalent on 1<sup>st</sup> April of respective year. The under-recovered amount also pertains to AFC of respective year. Therefore, it is requested to allow billing of under-recovered amount with interest as above.



13. In past, CEA/CWC was requested to certify the actual inflow data of Chutak Power Station. CWC vide letter dated 31.01.2017 has expressed their inability to certify the inflow series on year to year basis.

**Submission of the Petitioner in compliance to ROP of hearing dated 13.10.2022 in petition No.133/MP/2022**

14. The subject matter was heard by CERC on 13.10.2022 and ROP has been issued on 20.10.2022. In order to comply with the directions contained in the said ROP, the point-wise reply is submitted by Petitioner as under.

- (i) CWC in the past has shown their inability to certify the inflow data and the same is also evident from earlier CERC orders in shortfall petitions. The letter of CWC showing their inability to certify data inflow data has already been provided at Annex-X (Page no.239) of the petition. CEA, vide letter 02.11.2022, has been again requested to certify the actual inflow data from CWC. In the meanwhile, in support of actual inflow, rainfall data reported by IMD is attached.

In the past also, CERC has considered rainfall data of IMD while allowing shortfall in energy generation due to less inflow vide order dtd.09.02.2021 in petition No.328/MP/2018 for the year 2017-18. The relevant para of order dtd.09.02.2021 is reproduced as under:

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

*When the rainfall for the monsoon season of June to September for the country as a whole is within 10% of its long period average, it is categorized as a “Normal” monsoon. It is categorized as “Excess” monsoon, if it is above 110 % of long period average and “Deficient”, if it is below 90% of long period average. The performance of monsoon rainfall over smaller areas of the country is monitored by evaluating the departures from the normal for each meteorological sub-division and district. The rainfall is classified as excess, normal deficient or scanty as per the following criteria. Excess +20% of normal or more, ‘Normal: +19% to -19% of normal, Deficient -20% to -59% of normal, Scanty: -60 % of normal or less*



*The 'monthly normal' rainfall of a station was calculated using all the available data during the period 1941-1990. (In the Statistical Abstract, India 2004 this period was 1901-1970). (The monthly "normal rainfall" of the sub-division is the mean of monthly normal rainfall of the corresponding stations and "annual normal rainfall " is the sum of the monthly normal rainfall for all the 12 months.*

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

- (ii) Design energy calculation as approved by CEA is attached. The excel file of the same has been uploaded along with ROP through Saudamini Portal.
- (iii) During high inflow season daily maximum possible generation has been calculated as per available inflow at 95% installed capacity. During low inflow period, daily maximum possible generation has been calculated as per available inflow. The soft copy of daily analysis is already uploaded along with petition through Saudamini Portal.
- (iv) NHPC vide letter dated 05.07.2022 & 07.09.2022 has requested for certification of planned and forced outage. However, CEA vide letter dated 28.09.2022 has informed that the data of planned and forced outage for the year 2018-2019 should be obtained from RPC/RLDC. The planned and forced outage data of all the power stations of NHPC is updated daily only on the NPP portal of CEA, so efforts are being made to provide this data from CEA. NHPC shall submit the information in CERC as additional information as and when the same is received from CEA.
- (v) Day-wise details of scheduled energy, actual energy injected in the grid and energy accounted for in DSM along with the revenue earned from DSM for such energy has been attached.
- (vi) Chutak power station is run-of-the-river scheme with an installed capacity of 44 MW (4X11 MW) to harnesses the Hydropower potential of river Suru (a tributary of Indus river) which is located in Kargil district of Union Territory of Ladakh. The Suru River is a 185 kilometers long river that originates from the Panzella glacier which lies at Pensi La pass near the Drang Drung Glacier. Most part of the river flows within the jurisdiction of Kargil district. It flows through the towns of Tongul, Suru, Grantung, Goma and Kharul. Therefore,



rainfall data of district Kargil, where the power station is situated & UT of Ladakh is attached.

- (vii) CERC had allowed the deemed generation benefit vide order dated 31.12.2012 in I.A No. 15/2012 in Petition No.23/GT/2011, as under:

*“19. Taking into consideration that the recovery of energy charges shall be less if the beneficiary demands/schedules for lesser energy (than declared by the generator) due to non-availability of load, we, in exercise of power under Regulation 44 of the 2009 Tariff Regulations, relax the provisions of Clause (4) of Regulation 22 of the 2009 Tariff Regulations and allow the recovery of energy charges, corresponding to difference between energy declared to be generated and the energy scheduled by the beneficiary (due to non-availability of load) as deemed generation along with recovery of monthly energy charges for scheduled energy to be calculated as per provisions of the 2009 Tariff Regulations. The prayer of the petitioner is allowed in terms of the above.”*

Further vide order dated 23.02.2022 in Petition No. 283/GT/2020, deemed generation has been allowed by the commission till 01.10.2019. Therefore, in view of above Hon'ble Commission is requested to consider the shortfall calculation beyond 01.10.2019.

- (viii) Chutak is a run-of-river hydro generating station with 'nil' live storage capacity. Generating station can be overloaded upto 10% of installed capacity. However, during the monsoon period, TRT level is generally high due to high inflow in the river, resulting in reduced head, which limits the overload capability of generating station.
- (ix) Based on the past practice by Hon'ble Commission in similar matters, all the relevant information / document to justify the claims in the petition stands submitted.

### **Analysis and Decision:**

15. CERC (Terms and Conditions of Tariff) Regulations, 2019 provides for recovery of shortfall in energy charges for the reasons beyond the control of generating station during the tariff period 2019-24. As such, the present application {under regulation-44(6) of CERC (Terms and Conditions of Tariff) Regulations, 2019} is for recovery of short fall in energy charges due to shortfall in energy generation which is reproduced below:



**“44(6) In case the *saleable scheduled energy* (ex-bus) of a hydro generating station during a year is *less than the saleable design energy* (ex-bus) for reasons **beyond the control of the generating station**, the treatment shall be as per clause (7) of this Regulation, on an application filed by the generating company.”**

16. The design energy of the station is 212.93 MUs and considering normative auxiliary energy consumption of 5%, the saleable design energy after accounting for free power of 13%, works out to 175.99 MUs ( $212.93 \times 0.95 \times 0.87$ ). In this regard, the Commission, vide order dated 23.02.2022 in Petition No. 283/GT/2020, has allowed relaxed normative auxiliary energy consumption of 5% to the instant generating station considering heating requirement of the station. However, the actual energy consumption of the station is 3.36% and 2.7% during years of energy shortfall i.e. 2019-2020 and 2020-21, respectively. As such, the Petitioner in its calculations has mapped the energy shortfall with respect to Saleable design energy (SDE) calculated by considering actual auxiliary energy consumption in place of normative auxiliary consumption. Based on above, SDE for the year 2019-20 works out to 179.02 MUs ( $212.93 \times 0.9664 \times 0.87$ ) and for 2020-21, the same works out to 180.25 MUs ( $212.93 \times 0.973 \times 0.87$ ) and the same has been considered in our analysis also.

### **Shortfall for the FY 2019-20**

17. The Petitioner has submitted the following table indicating monthwise details with respect to energy shortfall during the FY2019-20:





Sl. No.	Month	Design Energy (MU)	Saleable design energy (MU)	Saleable scheduled energy (MU)	Deemed Gen. excluding free power	Total Saleable including deemed	Shortfall (-) / Excess (+) (MU)	Actual PAF (%)
1	2	3	4	5	6	7	8=7-4	8
1.	April' 2019	10.51	8.84	3.69	5.56	9.24	0.40	34.35
2.	May' 2019	21.38	17.97	3.72	13.49	17.21	-0.76	60.96
3.	June' 2019	30.09	25.30	3.59	23.84	27.43	2.13	100
4.	July' 2019	31.10	26.15	10.26	17.70	27.96	1.81	100
5.	August' 2019	31.00	26.06	17.88	9.84	27.73	1.66	100
6.	September' 2019	26.93	22.64	16.11	11.01	27.13	4.49	98.10
7.	October' 2019	15.07	12.68	7.13	0.80	7.93	-4.75	24.73
8.	November' 2019	12.12	10.19	5.43	0.00	5.43	-4.76	21.90
9.	December' 2019	8.64	7.27	4.35	0.00	4.35	-2.92	17.13
10.	January' 2020	8.52	7.17	3.55	0.00	3.55	-3.61	13.61
11.	February' 2020	7.71	6.47	3.01	0.00	3.01	-3.47	12.22
12.	March' 2020	9.81	8.48	3.04	0.00	3.04	-5.24	11.58
<b>Total</b>		<b>212.93</b>	<b>179.02</b>	<b>81.75</b>	<b>82.25</b>	<b>164.00</b>	<b>-15.02</b>	<b>49.60</b>

18. The generating station has four units of 11 MW each. Since COD, the generating station was not connected to national grid. It was catering to the load of J&K through the state transmission and distribution network only. Further, load provided by J&K was much less than the plant capacity i.e. 44 MW. As such, Commission considering the fact that sole beneficiary would not be able to schedule energy equal to the energy declared by the station made a provision of deemed energy benefit which represents the difference between the energy declared by the station and the energy scheduled by the J&K



The relevant portion of the CERC order dated 31.12.2012 in I.A No. 15/2012 in Petition No.23/GT/2011, is as under:

*“19. Taking into consideration that the recovery of energy charges shall be less if the beneficiary demands/schedules for lesser energy (than declared by the generator) due to non-availability of load, we, in exercise of power under Regulation 44 of the 2009 Tariff Regulations, relax the provisions of Clause (4) of Regulation 22 of the 2009 Tariff Regulations and allow the recovery of energy charges, corresponding to difference between energy declared to be generated and the energy scheduled by the beneficiary (due to non-availability of load) as deemed generation along with recovery of monthly energy charges for scheduled energy to be calculated as per provisions of the 2009 Tariff Regulations. The prayer of the petitioner is allowed in terms of the above.”*

19. Further vide order dated 23.02.2022 in Petition No. 283/GT/2020, deemed generation has been allowed by the commission till 01.10.2019. Accordingly, the Petitioner based on certified deemed energy and actual energy scheduled by the J&K has been billing the beneficiary. For the purpose of this petition also the deemed energy billed till 01.10.2019 along with scheduled energy has been made the basis of energy shortfall claimed. As such, the same is in order and has been considered for arriving at the allowable energy charges.

20. As per submission of the Petitioner, saleable scheduled energy during 2019-20 is 164 MU and saleable design energy is 179.02 MU. It is noted that sign convention used by the Petitioner is as under:

- a) In case the generation is less than design energy representing shortfall, (-) sign has been used.
- b) In case of the generation is more than design energy representing excess generation, (+) sign has been used.

21. There is a total shortfall of (-)15.02 MU (164 MU-179.02 MU) in generation during 2019-20. The reasons for shortfall of (-)15.02 MU as reported are as under:



<b>A. Shortfall due to reasons beyond the control of petitioner</b>	
Energy shortfall due to less inflow from design inflow (a)	-24.94 MU
Excess Energy generated due to excess inflow from design inflow (b)	6.68 MU
Net shortfall due to inflows (c)=(a)-(b)	-18.26
Silt flushing (d)	-0.25 MU
Transmission constraints (e)	-3.00 MU
<b>Total (A) = (c)+(d)+(e)</b>	<b>-21.51 MU</b>
<b>B. Shortfall due to reasons within the control of petitioner</b>	
Other constraint (Partial load / ramping up/down during peaking / high inflow / TRT level etc.)	-0.52 MU
Generation beyond design energy calculation	(+) 7.01 MU
<b>Total (B)</b>	<b>(+) 6.49 MU</b>
<b>Grand Total (A+B)</b>	<b>- 15.02 MU</b>

\*Sign convention **Shortfall (-) / Excess (+)**

22. It is noted from the above submission of the Petitioner that there is net energy shortfall of (-) 15.02 MUs (-21.51+6.49) against which energy shortfall due to reasons beyond the control of the Petitioner have been indicated as (-) 21.51 MUs and excess energy generation due to reasons within the control of the Petitioner have been indicated as (+) 6.49 MUs (+7.01-0.52). It is further noted that the excess generation of (+) 7.01 MUs beyond design energy has helped reducing the net shortfall to (-)15.02 MUs which otherwise would have been (-) 22.03 MUs (-21.51-0.52).

23. On scrutiny of the daily inflow data, corresponding maximum possible generation, actual energy generated, rainfall data, reasons of shortfall beyond and within the control of the Petitioner, corresponding quantum of energy shortfall beyond and within the control of the Petitioner, we have following observations:



- a) Though inflow data has not been vetted by the CEA/CWC, the rainfall data as per IMD reports, indicates low rainfall in comparison to long period averages. As such, we have considered the inflow data submitted by the Petitioner for further analysis.
- b) To demonstrate the energy potential of the actual inflows during the year 2019-20, the Petitioner has calculated the maximum possible saleable ex-bus generation of 159.40 MUs considering design head of 52 meters, design discharge of 96 cumecs and 95% machine availability, overall efficiency of 90%, actual auxiliary consumption of 3.36%, average daily actual inflows and free energy to home state.
- c) However, it is observed from the Design Energy calculations of CEA that varying heads ranging from 49.10 m to 63.20 m have been used corresponding to varying design inflows ranging from 112 cumecs to 20.60 cumecs in place of single design head of 52 meters used by the Petitioner. As such, to capture the impact of the varying head, the following formulae has been used to calculate the maximum possible saleable ex-bus generation corresponding to actual inflows available during each day of 2019-20:

Maximum possible saleable ex-bus generation for a day = Design energy for the day x Actual inflow (cumecs)x 0.87x0.9664/Design Inflow, Where 0.87 represents multiplying factor to account for the free energy to home states and 0.9664 represents multiplying factor to account for the actual auxiliary consumption of 3.36%. Further, design inflow has been restricted to 95% of the combined design discharge of all units.



- d) Further, the above derived value of maximum possible saleable ex-bus generation for a day is subject to ceiling of 0.843 MUs ( $44\text{MW} \times 24 \times 0.87 \times 0.9664 \times 0.95 / 1000$ ) where 0.95 is to account for the machine available used for calculation of design energy during peak season. Summation of 365 such derived values represents the maximum possible saleable ex-bus generation for the year.
- e) Following the above methodology the annual maximum possible saleable ex-bus generation for the year 2019-20 corresponding to actual inflows has been assessed at 167.81 MU against the value of 159.40 MU. Accordingly, the difference of (-) 11.21 MU between the maximum possible saleable ex-bus generation (167.81) and the saleable design energy (179.02 MU), represents energy shortfall due to less inflows and we, thus, hold that the same was beyond the control of the Petitioner.
- f) With regard to energy short fall of (-) 0.25 MUs due to silt flushing as claimed by the Petitioner, it has been held by the Commission in number of similar Petitions that the same is beyond the control of the Petitioner as generation needs to be stopped for silt flushing to avoid turbine damage as and when the silt level reaches beyond the permissible limits. Accordingly, we hold that energy short fall of (-) 0.25 MUs was beyond the control of the Petitioner.

With regard to energy shortfall of (-) 3 MUs as claimed by the Petitioner due to Transmission constraints, the same has been calculated to be (-) 1.01 MUs based on the unit hours reported to be lost due to transmission constraints. As such, Commission in consideration of the fact that energy shortfall due to transmission constraints is beyond the control of the Petitioner, allows shortfall of



(-)1.01 MUs under the head of “Energy shortfall beyond the control of the Petitioner”.

- g) Energy shortfall of (-) 0.52 MUs claimed on account of “Other constraint”, has been rightly placed by the Petitioner under the head of “Shortfall due to reasons within the control of petitioner”. However, the same has been found to be (-) 1.30 MUs for the days for which “Other Constraints” has been cited by the Petitioner as a reason of shortfall.
- h) Further, with regard to Generation beyond design energy calculation of (+) 7.01 MUs i.e. the energy generated by the Petitioner during peak season by utilizing the machine capacity over and above 95%, the same is in order as per our calculations also. 95% being the machine availability as per definition of design energy as per Tariff Regulations of CERC and the same is accounted for in calculation of saleable design energy as well as in our calculation of maximum possible saleable ex-bus generation. Though the quantum of such energy i.e. 7.01 MUs calculated by the Petitioner is in order, however, we are not in agreement with the placement of the same under the category of “Shortfall due to reasons within the control of petitioner”. Actual inflows is a factor beyond the control of the Petitioner and such quantum of generation is only possible if actual inflows are more than the design inflow required for generation corresponding to 95% of installed capacity. It is for the first time that the Petitioner has accounted this energy under “Shortfall due to reasons within the control of petitioner”. In all its Petitions for recovery of energy charge shortfall for the period 2009-14 and 2014-19, the Petitioner itself used to place this energy generated by using machine capacity over 95% under the head “Energy generated due to excess



inflow from design inflow” which together with “Energy shortfall due to less inflow from design inflow” are placed under category of “Shortfall due to reasons beyond the control of petitioner” as the actual inflows are beyond the control of the Petitioner. Commission also while dealing with the petitions of the Petitioner as well as other generating companies for the period 2009-14 and 2014-19 has always considered such energy generated under the head of ‘Shortfall due to reasons beyond the control of petitioner’.

24. Accordingly, in consideration of above findings, the energy shortfall table has been revised as under

<b>A. Shortfall due to reasons beyond the control of petitioner</b>	
Net of Energy shortfall due to less inflow from design inflow and Energy generated due to excess inflow from design inflow	-11.21 MU
Excess Generation beyond design energy by use of capacity beyond 95% of installed capacity due to excess inflow from design inflow	(+)7.01 MU
Silt flushing	-0.25 MU
Transmission constraints	-1.01 MU
<b>Total (A)</b>	<b>-5.46 MU</b>
<b>B. Shortfall due to reasons within the control of petitioner</b>	
Other constraint (Partial load / ramping up/down during peaking / high inflow / TRT level etc.)	-1.30 MU
Other shortfall due to non-utilization of full potential of actual flows during the year	-8.26 MU
<b>Total (B)</b>	<b>-9.561MU</b>
<b>Grand Total (A+B)</b>	<b>- 15.02 MU</b>

25. The above deliberations bring out that as against SDE of 179.02 MUs, the total saleable ex-bus potential of actual inflows by use of capacity till 95% of installed capacity was 167.81 MUs, accordingly, the shortfall due to less inflows was (-)11.21 MUs. Further after accounting for all the reasons of shortfall listed in above table



(beyond and within control of the Petitioner) the saleable ex-bus generation should have been 172.26 MUs (179.02-11.21+7.01-0.25-1.01-1.30) against the actual saleable ex-bus generation of 164 MUs achieved by the station. As such, the further shortfall of (-) 8.26 MUs (164-172.26) represents "Other shortfall due to non-utilization of full potential of actual flows during the year, has been considered as shortfall within the control of the Petitioner. Accordingly, Commission is of the view that out of total shortfall of (-) 15.02 MUs, the Petitioner needs to be compensated for shortfall of (-) 5.46 MUs which was beyond the control of the Petitioner.

26. Total energy charge shortfall of ₹5.25 Crs has been reported by the Petitioner based on energy billed as per Regional Energy Accounts. The same has been verified from the amount billed to the beneficiaries and amount allowable as Energy Charges which is one half of the AFC allowed for the year 2019-20 by the Commission vide order dated 23.02.2022 in petition No. No.283/GT/2020. Based on the above table, the energy charges recoverable by the Petitioner out of total shortfall of ₹5.25 Crs. has been worked out as under:

Total shortfall in generation during FY 2019-20	A	-15.02 MU
Total under-recovery of energy charges during FY 2019-20	B	₹5.25 Crs
Shortfall in generation due to reasons beyond control	C	-5.46 MU
Shortfall in energy charges to be recovered during FY 2019-20	$D=C*B/A$	<b>₹1.91 Crs.</b>

**Shortfall for the FY 2020-21:**





The Petitioner has submitted the following table indicating month wise details with respect to energy shortfall during the FY2019-20:

Sl. No.	Month	Design Energy (MU)	Saleable design energy (MU)	Saleable scheduled energy (MU)	Shortfall (-) / Excess (+) (MU)	Actual PAF (%)
1	2	3	4	5	6=5-4	8
1.	April' 2020	10.51	8.90	3.63	-5.27	13.87
2.	May' 2020	21.38	18.10	10.80	-7.30	43.52
3.	June' 2020	30.09	25.51	24.64	-0.87	96.17
4.	July' 2020	31.10	26.31	20.48	-5.83	105.26
5.	August' 2020	31.00	26.20	27.00	0.8	105.26
6.	September' 2020	26.93	22.81	20.58	-2.23	85.08
7.	October' 2020	15.07	12.81	9.35	-3.46	36.69
8.	November' 2020	12.12	10.30	5.50	-4.80	22.25
9.	December' 2020	8.64	7.31	4.07	-3.24	16.38
10.	January' 2021	8.52	7.20	3.09	-4.11	12.93
11.	February' 2021	7.71	6.50	2.29	-4.21	10.80
12.	March' 2021	9.81	8.30	2.19	-6.11	13.09
<b>Total</b>		<b>212.93</b>	<b>180.25</b>	<b>133.63</b>	<b>-46.62</b>	<b>42.88</b>

27. On scrutiny of the daily inflow data, corresponding maximum possible generation, actual energy generated, rainfall data, reasons of shortfall beyond and within the control of the Petitioner, corresponding quantum of energy shortfall beyond and within the control of the Petitioner, we have following observations:

- a) Though inflow data has not been vetted by the CEA/CWC, the rainfall data as per IMD reports, indicates low rainfall in comparison to long period averages. As such, we have considered the inflow data submitted by the Petitioner for further analysis.



b) As per submission of the Petitioner, saleable scheduled energy during 2020-21 is 133.63 MU and saleable design energy is 180.25 MU (AEC being 2.7%). There is a net shortfall of (-) 46.62 MU (133.63 MU –180.25 MU) in generation during 2020-21. The reasons for shortfall of (-) 46.62 MU as submitted by the Petitioner are as under:

<b>A. Shortfall due to reasons beyond the control of petitioner</b>	
Energy shortfall due to less inflow from design inflow (a)	-38.95 MU
Energy generated due to excess inflow from design inflow (b)	0.94 MU
Net Energy shortfall due to less inflows (c)=(a)+(b)	-38.01
Silt flushing (d)	-1.21 MU
Transmission constraints (e)	-11.17 MU
<b>Total (A)= (c)+(d)+(e)</b>	<b>-50.39 MU</b>
<b>B. Shortfall due to reasons within the control of petitioner</b>	
Unit Outage (f)	-0.02 MU
Other constraint (Partial load / ramping up/down during peaking / high inflow / TRT level etc.) (g)	-0.37 MU
Generation beyond design energy calculation (h)	+4.16 MU
<b>Total (B)=(f)+(g)+(h)</b>	<b>3.77 MU</b>
<b>Grand Total (A+B)</b>	<b>-46.62 MU</b>

\*Sign convention **Shortfall (-) / Excess (+)**

c) In line with discussion at para 23 above, following formulae has been used to calculate the maximum possible saleable ex-bus generation corresponding to actual inflows available during each day of 2020-21 to capture the impact of the varying heads as used by CEA in its calculation of design energy:

Maximum possible saleable ex-bus generation for a day = Design energy for the day x Actual inflow (cumecs)x0.87x0.973/Design Inflow, Where 0.87 represents multiplying factor to account for the free energy of 13% to home states and 0.973 represents multiplying factor to account for the actual auxiliary consumption of 2.7%.



d) Further, the above derived value of maximum possible saleable ex-bus generation for a day is subject to ceiling of 0.849 MUs ( $44\text{MW} \times 24 \times 0.87 \times 0.973 \times 0.95 / 1000$ ) where 0.95 is to account for the machine availability used for the calculation of design energy during peak season. Summation of 365 such derived values represents the maximum possible saleable ex-bus generation for the year.

e) Following the above methodology, the annual maximum possible saleable ex-bus generation for the year 2020-21 corresponding to actual inflows has been assessed at 148.37 MUs against the value of 141.49 MUs as calculated by the Petitioner. Accordingly, the energy shortfall of (-)31.88 MUs between the maximum possible saleable ex-bus generation (148.37 MUs) and saleable design energy (180.25 MU), represents shortfall due to less inflows on net basis and we, thus, hold that the same was beyond the control of the Petitioner.

f) With regard to energy short fall of (-)1.21 MUs due to silt flushing as claimed by the Petitioner, it has been held by the Commission in number of similar Petitions that the same is beyond the control of the Petitioner as generation needs to be stopped for silt flushing to avoid turbine damage as and when the silt level reaches beyond the permissible limits. Accordingly, we hold that energy short fall of (-) 1.21 MUs was beyond the control of the Petitioner.

g) With regard to energy shortfall of (-)11.17 Mus as claimed by the Petitioner due to Transmission constraints, the same has been calculated to be (-) 9.32 MUs as per our calculations based on the number of hours for which units were out due to transmission constraints. As such, Commission in consideration of the fact that energy shortfall due to transmission constraints is beyond the control of the Petitioner, allows



shortfall of (-)9.32 MUs under the head of “Energy shortfall beyond the control of the Petitioner”

h) Energy shortfall of (-) 0.02 MUs as claimed by the Petitioner due to unit outage is in order and has been rightly placed by the Petitioner under the head of “Energy shortfall with in the control of the Petitioner”. Accordingly, we allow the same.

i) Energy shortfall of (-)0.37 MUs claimed on account of “Other constraint”, has been rightly placed by the Petitioner under the head of “Shortfall due to reasons within the control of petitioner”. However, the same has been found to be (-) 0.89 MUs as per calculations for the days for which “Other Constraints” has been cited by the Petitioner as a reason of shortfall.

j) Further, with regard to Generation beyond design energy calculation of 4.16 MUs i.e the energy generated by the Petitioner during peak season by utilizing the machine capacity over and above 95%, the same has been found to be 4.09 MUs as per our calculations. As already discussed at para 20(i) above, we are not in agreement with the placement of this additional generation beyond design energy, under the category of “Shortfall due to reasons within the control of petitioner”. Commission while dealing with the petitions of the Petitioner as well as other generating companies for the period 2009-14 and 2014-19 has always considered such energy generated under the head of ‘Shortfall due to reasons beyond the control of petitioner’.

k) Accordingly, in consideration of above findings, the energy shortfall table has been revised as under:

<b>A. Shortfall/ Excess due to reasons beyond the control of petitioner</b>	
Net Energy shortfall due to less inflows	-31.88 MU
Silt flushing	-1.21 MU
Transmission constraints	-9.32 MU



Excess Generation beyond design energy by use of capacity beyond 95% of installed capacity due to excess inflow	(+)4.09 MUs
<b>Total (A)</b>	<b>-38.32 MU</b>
<b>B. Shortfall due to reasons within the control of petitioner</b>	
Unit Outage	-0.02 MU
Other constraint (Partial load / ramping up/down during peaking / high inflow / TRT level etc.)	-0.89 MU
Other shortfall due to non-utilization of full potential of actual flows during the year.	-7.39 MU
<b>Total (B)</b>	<b>-8.3 MU</b>
<b>Grand Total (A+B)</b>	<b>-46.62 MU</b>

28. The above deliberations bring out that as against SDE of 180.25 MUs, the total saleable ex-bus potential of actual inflows by use of capacity till 95% of installed capacity was 148.37 MUs, and accordingly, the shortfall due to less inflows was (-)31.88 MUs (148.37-180.25). Further after accounting for all the reasons of shortfall listed in above table (beyond and within control of the Petitioner) the saleable ex-bus generation should have been 141.02 Mus (180.25-31.88-1.21-9.32+4.09-0.02-0.89) against the actual saleable ex-bus generation of 133.63 MUs achieved by the station. As such, the further shortfall of (-) 7.39 MUs (133.63-141.02) represents “Other shortfall due to non-utilization of full potential of actual flows during the year” has been considered as shortfall within the control of the Petitioner. Accordingly, Commission is of the view that out of total shortfall of (-) 46.62 MUs, the Petitioner needs to be compensated for shortfall of (-) 38.32 MUs which was beyond the control of the Petitioner.

29. Total energy charge shortfall of ₹18.60 Crs for the year 2020-21 has been reported by the Petitioner based on energy billed as per Regional Energy Accounts. The same has been verified from the amount billed to the beneficiaries and amount allowable as Energy Charges which is one half of the AFC allowed for the year 2020-21



by the Commission vide order dated 23.02.2022 in petition No. No.283/GT/2020. Based on the above table, the energy charges recoverable by the Petitioner out of total shortfall of ₹18.60 Crs. has been worked out as under:

Total shortfall in generation during FY 2020-21	A	- 46.62 MU
Total under-recovery of energy charges during FY 2019-20	B	₹18.60 Crs
Shortfall in generation due to reasons beyond control	C	-38.32 MU
Shortfall in energy charges to be recovered during FY 2019-20	$D=C*B/A$	<b>₹15.29 Crs.</b>

30. Accordingly, in terms of Regulation 44(7) of the 2019 Tariff Regulations, we allow the energy charge shortfall of Rs.1.91 crore for the FY 2019-20 and Rs.15.29 crore for the FY 2020-21. The same shall be recovered in six equal monthly interest free instalments by raising supplementary bills to the beneficiaries as per Regulation 44(8) and 44(7) of CERC (Terms and Conditions of Tariff) Regulation 2019. Further, the difference in energy charge shortfall to be recovered for the FY 2019-20 and FY 2020-21, which may arise after true up of tariff for the period 2019-24 shall be recovered directly by the generating station from the beneficiaries through supplementary bills after true-up.

31. Petition No. 133/MP/2022 is disposed of in terms of above.

Sd/-

**(P.K. Singh)**  
**Member**

Sd/-

**(Arun Goyal)**  
**Member**

Sd/-

**(I.S. Jha)**  
**Member**

