

**Central Electricity Regulatory Commission
New Delhi**

Petition No.184/MP/2019

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

Date of Order: 4th of February, 2020

In the matter of

Petition under Regulation 44(6), (7) & (8) of The Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 for recovery of unrecovered energy charges due to shortfall in energy generation for reasons beyond the control of generating station during the FY 2018-19 in respect of Karcham Wangtoo HEP

And

In the matter of

JSW Hydro Energy Ltd.
(Formerly Himachal Baspa Power Company Limited)
4th Floor, NTH Complex,
A-2, Shaheed Jeet Singh Marg,
Qutub Institutional Area, New Delhi 110067..... **Petitioner**

Vs

1. PTC India Ltd.
2nd Floor, NBCC Tower, 15,
Bhikaji Cama Place, New Delhi 110066
2. Ajmer Vidyut Vitran Nigam Limited
Through Chairman & Managing Director, Hathi Bhata,
City Power House, Ajmer, 305001, Rajasthan
3. Jaipur Vidyut Vitran Nigam Limited



Through Chairman & Managing Director,
Vidyut Bhawan, Jaipur, 302005, Rajasthan

4. Jodhpur Vidyut Vitran Nigam Limited
Through Chairman & Managing Director, New Power House,
Industrial Area Jodhpur, 342003, Rajasthan

5. Haryana Power Purchase Centre
Through its Chairman, Shakti Bhawan, Sector 6,
Panchkula 134109 Haryana

6. Punjab State Power Corporation Ltd.
Through its Chairman, The Mall, Patiyala, 147001

7. Uttar Pradesh Power Corporation Ltd
Through Superintending Engineer, SPAT Circle,
Shakti Bhawan, 14, Ashok Marg, Lucknow 226001 UP.....**Respondents**

Parties present:

Shri Aman Anand, Advocate, JSWHEL
Shri Aman Dixit, Advocate, JSWHEL
Shri Anurag Aggarwal, JSWHEL
Shri Kanchak Negi, JSWHEL
Shri Suraj Guru, JSWHEL
Shri Ravi Kishore, Advocate, PTC
Ms. Rajshree Chaudhary, Advocate, PTC
Ms. Swapna Seshadri, Advocate, PSPCL
Shri Damodar Solanki, Advocate, HPPC
Shri Ashwin Ramanathan, Advocate, HPPC

ORDER

The Petitioner, JSW Hydro Energy Ltd.(hereinafter referred to as the petitioner) has filed this petition for recovery of unrecovered energy charges due to



shortfall in energy generation for reasons beyond the control of generating station during the FY 2018-19 in respect of Karcham Wangtoo HEP, seeking the following relief(s):

- a) *Allow recovery of energy charges amounting to Rs. 26.88 crore in FY 2019-20 in six equal monthly instalments, against the shortfall in energy charges on account of saleable scheduled energy (ex-bus) being less than saleable design energy (ex-bus) of 154.21 Mus in FY 2018-19, as per Regulation 44(6), (7) & (8) of The Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019; and*
- b) *Allow further revision of shortfall in energy charges, if any, on the basis of true up by this Hon'ble Commission for FY 2018-19, by way of a supplementary bill.*
- c) *Pass any such further order(s) which this Hon'ble Commission may deem just fit and proper in favour of the Petitioner.*

Background

2. The Petitioner (earlier known as Himachal Baspa Power Company Ltd.) is a generating company, which owns operates and maintains the 1000 MW (250x4 MW) Karcham Wangtoo H.E.P (KWHEP) in the State of Himachal Pradesh.

3. Respondent No. 1, PTC India Ltd. is an inter-State trading licensee and has entered into Power Purchase Agreement (PPA) dated 21.3.2006 and 1.12.2017 with the Petitioner for purchase of 880 MW of power from KWHEP.

4. The Respondents 2 to 4 are the Distribution Licensees in the State of Rajasthan. The Respondent No. 5 is the Nodal procurement agency for Uttar Haryana Bijli Vitran Nigam and Dakshin Haryana Bijli Vitran Nigam in the State of



Haryana. The Respondent No. 6 is the Distribution Licensee in the State of Punjab. The Respondent No. 7 is the Distribution Licensee in the State of Uttar Pradesh.

5. Since the Respondents 2 to 7 have entered into Power Sales Agreements with Respondent No. 1, for re-sale of power purchased by the Respondent No. 1 from KWHEP, the Petitioner has a composite scheme for generation and sale of electricity in more than one State. Accordingly, the tariff for KWHEP is regulated by this Commission in terms of Section 79(1)(b) of the Electricity Act, 2003.

6. The Commission has approved the capital cost and Annual Fixed Cost (AFC) for the control period 2014-19 in respect of KWHEP vide its order dated 30.3.2017. AFC approved by the Commission as per order dated 30.3.2017 for FY 2018-19 is Rs. 125233.78 lakh. The annual design energy and saleable design energy approved and considered by the Commission are 4131.06 MU and 3591.71 MU respectively.

Submissions of the Petitioner

7. The Petitioner has mainly submitted as under:

a) KWHEP is a run-of-river with pondage hydro generating plant and has declared commercial operation on 13.09.2011. The Petitioner has filed the present petition Regulation 44(6), (7) & (8) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as the 2019 Tariff Regulations) for recovery of shortfall in energy charges due to shortfall in energy generation in FY 2018-19. Relevant regulations are reproduced herein below:

“44. Computation and payment of capacity charge and energy charge for hydro generating stations:

.....



(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

(7) Shortfall in energy charges in comparison to fifty percent of the annual fixed cost shall be allowed to be recovered in six equal monthly installments:

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

(8) Any shortfall in the energy charges on account of saleable scheduled energy (ex-bus) being less than the saleable design energy (ex-bus) during the tariff period 2014-19 which was beyond the control of the generating station and which could not be recovered during the said tariff period shall be recovered in accordance with clause (7) of this Regulation.

b) Shortfall in generation has occurred for the first time since the commercial operations of KWHEP. Shortfall in saleable scheduled energy (ex-bus) against the saleable design energy (ex-bus) during FY 2018-19 for KWHEP, is as under:

(In MU)

1. Saleable design energy (Ex-bus)	3591.71	Approved in tariff order dated 30.3.2017
2. Saleable scheduled energy (Ex-bus)		
a. Long term beneficiaries	3413.04	As per monthly REA statement
b. Power Exchange under Short term	11.16	As per bills raised under short term
Total (2)	3424.20	
3. Shortfall (1-2)	167.51	
4. Less: Energy sent to GoHP, which long term beneficiaries were entitled	-13.30	Refer Annexure 9
5. Net shortfall claimed (3-4)	154.21	

c) Shortfall in generation is due to less inflow of water as compared to the designed inflow of water during the period from April'18 to March'19 and due to silt flushing on account of high silt content during the period from 25.7.2018 to 24.8.2018.



d) The above data has been prepared by monitoring the actual inflow and reservoir level at its Karcham dam site and energy generated at generator terminal. The data in respect of forced outage of units due to silt flushing is collected from the website of NRLDC.

e) The petitioner has no control over the actual inflow of water at the Karcham dam site or the quantity of silt flow. The Petitioner has no reasons/benefit to furnish undervalued/ understated data in respect of the same. Since shortfall in generation is not attributable to any inefficiency of the Petitioner, the actual inflow data and the silt flushing data may be considered.

f) The shortfall in saleable scheduled energy against saleable design energy of 154.21 MU due to reasons beyond the control of the Petitioner may be allowed for recovery during FY 2019-20 in six equal instalments.

g) Calculation of under-recovered energy charges claimed during FY 2018-19 is under:

1	Approved AFC for FY 2018-19	Rs. (In lakh)	1,25,233.78
2	Approved saleable design energy	MU	3,591.71
3	Energy charge rate (as per regulation 44(5) of the 2019 Tariff Regulations)	Rs. per kWh	1.743
4	Shortfall in saleable scheduled energy	MU	154.21
5	Under recovered energy charges (3*4)	Rs. Crore	# 26.88

Subject to revision of AFC, in accordance with true up order

8. The matter was heard on 03.09.2019 and the Commission, after hearing the parties, admitted the petition. The Petitioner was directed to submit the following additional information:

(a) *Data of average actual inflows for the respective year, in which shortfall recovery had to be considered;*



- (b) Rainfall data for the concerned year as reported by IMD for the district in which plant was located and the adjoining districts;
- (c) Reconciliation statement of billing for the concerned year indicating energy charges billed;
- (d) Planned and forced machine outage data certified by CEA/NRLDC and its correlation with energy generation;
- (e) Documents to validate the energy loss due to silt i.e. outage certified by CEA/NRLDC;
- (f) Data of average actual inflows for the FY 2018-19 certified by CEA/CWC;
- (g) Excel sheet for Design Energy calculation; and
- (f) Excel sheet for the calculation done for energy shortfall on daily basis.

9. The Petitioner vide its affidavit dated 12.9.2019 has submitted the information as sought above. With regard to information regarding para (b) above, the Petitioner has submitted as under:

a) Rainfall data for the years 2014-15 to 2018-19 as reported by IMD for its Kalpa site in Kinnaur, nearest to Karcham Wangtoo HEP, in annexed as Annexure B.

b) Inflow of water in river Satluj is majorly dependent on the snowfall in its catchment area. The total catchment area of the Satluj above the Bhakra dam site is about 56875 sq. km. and above the Karcham dam is about 48755 sq. km. Snow catchment area of river Satluj is 38760 sq.km, which is about 80% of its total catchment area above Karcham dam. In this regard, it may be noted that the year 2017-18 had very meager snow fall in Beas as well as Satluj snow catchment area as compared to earlier years. Accordingly monthly report of Bhakhra Beas Management Board for the month of March'2019 on "Operation and Maintenance of RTDSS for Operational Management of Reservoirs of BBMB"(Annexure C), to substantiates the above claim. Relevant para from said report is reproduced as under:

" 2. Snow accumulation report

Summary of Snow Accumulation in Satluj and Beas Catchment in terms of Volume (MCM):

	Area	SWE (MCM)	SWE (MCM)	SWE (MCM)	SWE (MCM)	SWE (MCM)	SWE (MCM)
Catchment	Sq. Km	Till 31/3/14	Till 31/3/15	Till 31/3/16	Till 31/3/17	Till 31/3/18	Till 31/3/19
Beas	12603	1767	1841	1162	1367	789	2706
Satluj	53611	5765	7966	4199	5533	2444	11488

From the above it can be seen that snowfall during 2017-18 was lowest among 6 years which after snowmelt, serves as water inflow in succeeding year, for the rivers Beas and Satluj and therefore FY 2018-19 had low inflows in river Satluj as compared to earlier years."



10. With regard to information regarding para (d) above, the Petitioner has submitted a statement correlating the energy generation with the planned/ forced machine outages. Regarding certification of outage data, NRLDC vide its letter dated 13.6.2019 has intimated the Petitioner that NRLDC publishes various reports on its website in accordance with various provisions of CERC (IEGC) Regulations, 2010. There is neither any regulation nor any procedure in vogue for certification of planned/ forced outages of any generating stations by RLDCs. Further, NRLDC does not certify any desired data for specific purposes. Therefore, planned/ forced outages of KWHEP during FY 2018-19 cannot be certified. Petitioner thereafter apprised NRLDC vide letter dated 27.6.2019 that complete data is not available on their website. Therefore, Petitioner has submitted that it extracted information from its own records and the content available from the website of NRLDC to that extent.

11. With regard to information regarding para (e) above, the petitioner has submitted that as intimated by NRLDC in its aforesaid letter dated 13.6.2019, information published by NRLDC on its website regarding machine outages due to silt was extracted and submitted under Annexure 6 to the petition (Page 285-317 of the petition). However, as desired by the Commission, the same has been resubmitted.

12. With regard to information regarding para (f) above, the petitioner has submitted that to obtain data of average actual inflows either at Powari site or Moorang site (near Karcham Wangtoo HEP) for the FY 2018-19 certified by CEA/CWC, the Petitioner vide letters dated 10.6.2019, 21.6.2019, 22.8.2019 &



9.9.2019 had requested Indus Basin Organisation (IBO), Chandigarh chapter of Central Water Commission (CWC) for the same. In response, the Petitioner has submitted that IBO vide its letter dated 11.9.2019 has intimated as under:

“This organization does not maintain any hydrological observation site which measures the river inflows into the project. Accordingly, this office is unable to accede to your request. Further you have requested for providing river inflow data for Moorang site on river Satluj for the period April 2018 to March 2019. The purpose quoted for this request has been mentioned as submission of the same to CERC for ascertaining the loss of energy production. In this regard, it is to intimate that the Moorang site data is not representative of Karcham Wangtoo site, as there is considerable change in location, catchment area, characteristics etc. ___ this office is not in a position to recommend the release of the requested data.”

13. The Petitioner has submitted that it has no control over the actual inflow of water at the Karcham dam site or the quantity of silt flow. The Petitioner has no reasons/ benefit to furnish undervalued/ understated data in respect of the same. Since the shortfall in generation is not attributable to any inefficiency of the Petitioner, actual inflow data submitted by the petitioner may be considered.

14. Commission vide ROP of the hearing dated 11.12.2019 reserved the order in the Petition subject to submission of the following information by the petitioner:

(i) Methodology for calculating maximum possible generation on daily basis for the period 2018-19;

(ii) During certain days of high inflow period, it is noticed that the actual generation is more than 26.40 MUs, which can be generated by operating plant at 110% of Installed Capacity. The Petitioner shall clarify the same as it was not permitted to go beyond 1100 MW as per Commission Order dated 30.3.2017 in Petition No. 434/GT/2014;

(iii) Block wise details of energy accounted for in DSM duly certified by NRLDC/ NRPC along with the schedule generation and actual generation;



(iv) Planned and forced machine outage data certified by CEA and its correlation with energy generation.

15. The Petitioner vide its affidavit dated 27.12.2019 has submitted the information called for as under:

a) *In common parlance, gross generation from 1 MW in a day at 100% capacity utilisation can be derived as under:*

$$1 \text{ MW} = 1 * 24 \text{ Hrs} * 1000 \text{ kWh} = 24000 \text{ kWh}$$

Similarly;

$$1000 \text{ MW} = 1000 * 24 \text{ Hrs} * 1000 \text{ kWh} = 240,00,000 \text{ kWh} = 24.00 \text{ Mus}$$

At 110% capacity of 1000 MW:

$$1100 \text{ MW} = 1100 * 24 \text{ Hrs} * 1000 \text{ kWh} = 264,00,000 \text{ kWh} = 26.40 \text{ Mus}$$

Apart from above also, the design energy of 4131.06 Mus for Karcham Wangtoo HEP has ___ approved by CEA vide its letter dated 27.3.2015 and acknowledged by this Commission while passing MYT order dated 30.3.2017. Relevant portion of the said letter is attached as under:-

i. Energy generation for 90% dependable year (as per new approved series) year 1997-1998

ii. Power limited to 95% of installed capacity in Monsoon months as per CEA guideline

<i>iii. Overall efficiency</i>	<i>0.9200</i>
<i>iv. Total discharge required for net head</i>	<i>401.55 cumec</i>
<i>v. Gross head available</i>	<i>298.75 m</i>
<i>vi. Head loss for 1000MW</i>	<i>22.82 m</i>
<i>vii. Net Head for 1000MW</i>	<i>275.93 m</i>
<i>viii. Release for aquatic life cumec</i>	<i>7.380</i>

From the above, it is evident that 401.55 cumec water quantity is required for generation of 1000 MW of power. The Petitioner has considered a uniform rate of 401.55/1000= 0.40 cumec water per MW in Annexure 5 to the main petition, towards maximum possible generation on daily basis.

b) *The Commission in para 32 of the MYT order dated 30.3.2017 has observed as under:*

“..... Accordingly, we proceed to determine the tariff of the generating station based on the installed capacity of 1000 MW and the design energy of 4131.06 MU as recommended by CEA. The prayer of the petitioner is disposed of as under:

(a) The capacity of the generating station shall be 1000 MW (4 x 250MW) as accorded by CEA in TEC.



(b) Overload Capacity of generating station shall be 10% as per provisions of CEA Regulations and IEGC. NLDC/NRLDC shall ensure that the scheduling of the station shall be based on the installed capacity of 1000 MW with overload capacity of 10%.

Clause (ddd) of Regulation 2 of Central Electricity Regulatory Commission (Indian electricity Grid Code) Regulations 2010, defines Operating range as under:

(ddd) Operating range: means the range of frequency and voltage as specified under the operating code (part 5)

Clause (m) of Regulation 5.2 under Part 5 – Operating Code of Central Electricity Regulatory Commission (Indian electricity Grid Code) Regulations 2010, describes range of frequency as under:

(m) All users, SEB, SLDCs, RLDCs and NLDC shall take all possible measures to ensure that the grid frequency always remains within the [49.90-50.05 Hz] band.”

c) The petitioner has always scheduled power to NRLDC/ beneficiaries with a maximum cap of 26.40 Mus (at GT) and 26.08 Mus (Ex bus) keeping in mind para 32 of the MYT order dated 30.3.2017.

d) However, it may be observed from the information that there were total 43 instances when the generation has crossed maximum daily generation limit of 26.40 Mus. Karcham Wangtoo HEP units do operate under Free Governor Mode of Operation (FGMO) and frequency variation (going downwards) below 49.90 Hz, has automatically caused the generation going above the threshold limit of 26.40 Mus per day.

e) It may be noted that excess generation over 26.40 Mus per day has been in a range of 0.04% to 0.82% only. The said excess generation, **which is an unscheduled energy**, has been accounted under DSM Regulations.

Reply of PTC India Ltd., Respondent No. 1

16. The Respondent No. 1, PTC India Ltd. vide its affidavit dated 16.9.2019, has submitted that out of four DISCOMs, two DISCOMs i.e. Rajasthan and Haryana have already agreed for recovery of shortfall in energy charges for FY 2018-19 in six equal instalments.



Reply of UPPCL, Respondent No. 7

17. The Respondent No. 7, UPPCL vide its affidavit dated 16.07.2019, has mainly submitted as under:

a) There should be equipoise to ensure justice and fair play i.e. if a generating company gains incentive in electricity charges due to overflow of water wherein it produces saleable energy more than the saleable design energy, so it should also bear the loss of energy charges when the inflow is low. The Petitioner is craving compensation due to low inflow of water and outage due to the work of flushing out of silt. Accordingly, the claim of the Petitioner for compensation due to fall in inflow of water is not permissible because, it flouts the principle of equipoise between loss and gain and sharing thereof by the Petitioner.

b) Alternatively, if CERC decides to compensate the Petitioner for loss of generation due to low inflow or outage of machines on account of flushing of the silt then the principle of equipoise in sharing of loss and gain both by the Petitioner as well as the beneficiaries demands lowering of energy rate of 90 paise per unit to 45 paise per unit since the beneficiaries also share the loss in electricity charges due to low inflow and outage if outage is due to maintenance of turbine blades or flushing of the silt.

c) Period of outage due to maintenance of turbine blades may not be accounted for since the Petitioner has purchased spare turbine blades, the cost of which has already been capitalized. If the Petitioner is allowed to make up the loss due to low inflow (which means that the loss in this condition will be borne by the beneficiaries) then the law of equipoise between loss and gain demands that the above rate of 90 paise per unit may either be fully disallowed for the period 2014-19 or alternatively it may be reduced to 45 paise per unit during the period 2014-19. Under such conditions, in all the cases during 2014-19 period where actual saleable energy is more than saleable DE, the energy



charge rate may be reduced, if not disallowed in toto, to 45 paise per unit and the corresponding credit may be passed on to the beneficiaries who have been billed at the rate of 90 paise/unit. Therefore, the Commission may amend the proviso under Regulations 44(8) of the 2019 Tariff Regulations.

d) The Petitioner is totally silent about billing of capacity charges under low inflow conditions. Accordingly, the Commission may direct the Petitioner to submit the figures of PAFM Vs inflow during 2018-19 and the data for capacity charges during 2014-19 in cases where there was low inflow.

e) Although UPPCL has definite reservations against the imposition of loss quantum due to low inflow but in the academic interest it points out the flowing inconsistency in the calculation of under-recovered energy charges of Rs. 26.88 Crore. The Petitioner has taken AFC for FY 2018-19. However, the corresponding energy charges of Rs.1.743 per KWh are as per Regulation 44(5) of the 2019 Tariff Regulations.

Rejoinder of the Petitioner to reply of UPPCL

18. The petitioner vide its rejoinder dated 30.9.2019 has submitted as under:

a) The claim of the Petitioner is solely within the ambit and based on the Regulation 44(6), (7) & (8) of the 2019 Tariff Regulations. Therefore, the demand of Respondent No. 7 for amendment of Regulations on the basis of equity is beyond the scope of present proceedings.

b) Recovery of AFC in case of hydro power projects are in two parts in 50:50 ratio, i.e. capacity charges and energy charges. The recovery of second part 50% of AFC i.e. energy charges, 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.



c) The data related to PAFM and capacity charges, sought is irrelevant for the purposes of present petition, as PAFM is only relevant in relation to recovery of capacity charges; and the present petition relates to recovery of shortfall in energy charges. The principles and methodology of recovery of capacity charges and energy charges under the Regulations are totally distinct and have no overlap.

d) The data desired by Respondent in respect of PAFM and capacity charges for FY 2018-19 is already available under Annexure 9 to the main petition and Annexure D in the reply dated 12.9.2019 respectively.

e) The claim of the Respondent that the energy charge rate should be restricted to 45 paise, because they share losses in electricity if outage is due to maintenance of turbine blade or flushing of the silt, is beyond the scope of present proceedings. Even otherwise, no charges for secondary energy have been recovered in the present case.

f) There is no inconsistency in calculations of shortfall in energy charges and these calculations have been made strictly in accordance with the provisions of the 2019 Tariff Regulations. Further, the Respondent has failed to provide any details of such inconsistency to support its claim.

Reply of PSPCL, Respondent No. 6 and Reply of HPPC, Respondent No.5

19. The Respondents, PSPCL and HPCC, vide their affidavit dated 13.9.2019, made similar submission and have submitted as under:

a) Quantification of shortfall in saleable energy (ex-bus) against the saleable design energy (ex-bus) during FY 2018-19 by the Petitioner is also advanced on the basis of incorrect presumptions and inconsistencies in as



much as 35.97 MU of energy was in fact over-injected by the Petitioner as compared to the scheduled energy. Against sale to the long-term beneficiaries including PSPCL, the Petitioner has injected 3942.22 MU against the scheduled injection of 3906.25 MU. Therefore, at least to the extent of 35.97 MUs, there can be no question of energy shortfall towards the energy being supplied to the long-term beneficiaries and at the very least, this quantum should be adjusted against the claimed shortfall.

b) With respect to the loss on account of silt flushing, as a hydro power generator, the Petitioner ought to have planned for such circumstances. Silt flushing is a foreseeable event which keeps on happening with hydro power projects and it cannot be considered as being beyond the control of the Petitioner.

c) The Petitioner has claimed high silt content in the river due to silt flushing from 25.7.2018 to 24.8.2018. For this period of one month, the data submitted by the Petitioner itself does not support its case. From 24.7.2018 till 24.8.2018, the Petitioner has stated that there has been an excess flow of water as compared to the design inflow. Therefore, the high silt content has no effect for these days. Except on 6.8.2018, the unit itself was under outage and no effect of silt flushing would have been experienced.

d) The inconsistency in the data as provided and relied upon by the Petitioner is evident from the fact that as per the water flow data, the reason for shortfall in energy generation on 25.07.2018 has been attributed to excess inflow from design inflow. However, as per the silt flushing data placed on record, the reason for shutdown of units at Karcham Wangtoo for the very same date i.e. 25.07.2018, has been attributed to "high silt in river". This is one such instance, and that the records as provided by the Petitioner are replete with such inconsistencies. (submitted by PSPCL only).



e) In view of the above, without supporting evidence of any authentic data by a responsible organization, the data of the Petitioner itself doesn't support its case. The reason of silt flushing is therefore an after-thought and does not qualify as 'reasons beyond its control' which is the test laid down in Regulation 44 of the 2019 Tariff Regulations.

f) 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.

g) From the data pertaining to the water flow for FY 2018-19 as provided and relied upon by the Petitioner (at Page 277 of records), it is evident that the varied inflow of water cannot be a reason '*beyond the control*' of the Petitioner as per Regulation 44(6) of the 2019 Tariff Regulations. During instances when the actual inflow available was more than the design inflow, there has been substantial spillage for reasons solely attributable to the Petitioner. Though this is observed on a large number of days, a tabular representation for the same is given below:

Date	Design Inflow (cumecs)	Mandatory downstream release (cumecs)	Design inflow available for generation (cumecs)	Design Energy MUs	Actual Inflow available (cumecs)	Mandatory downstream release	Actual inflow available for generation	Spillage
08.06.2018	272.20	7.38	264.82	15.83	583.80	7.51	440.00	136.29
09.06.2018	272.20	7.38	264.82	15.83	603.97	7.51	440.00	156.46
24.07.2018	712.80	7.38	440.00	22.80	925.28	7.57	440.00	477.71
25.07.2018	712.80	7.38	440.00	22.80	926.14	7.57	424.96	493.61



23.08.2018	518.20	7.38	440.00	22.80	830.18	7.51	305.79	516.88
24.08.2018	518.20	7.38	440.00	22.80	750.47	7.51	273.34	469.62

h) It is evident from the data that there has been shortfall as well as over generation on account of the Petitioner resorting to tweaking with the reservoir level. A tabular representation for the same is given below:

Date	Design Inflow (cumecs)	Mandatory downstream release (cumecs)	Design inflow available for generation (cumecs)	Design Energy MUs	Actual Inflow available (cumecs)	Mandatory downstream release	Actual inflow available for generation	Reasons
03.04.2018	104.10	7.38	96.72	5.78	80.93	7.47	73.46	Less Generation by increasing reservoir level
04.04.2018	104.10	7.38	96.72	5.78	81.15	7.50	73.65	Excess Generation by depleting reservoir level

i) On dates when the actual inflow is more than the design inflow, the generator must use for electricity generation instead of spilling the water. This would compensate for the less generation on dates when the actual inflow of water is less than the design inflow.

j) Regulation 44(6) of the 2019 Tariff Regulations specifically states that only 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. The reasons furnished by the Petitioner cannot be said to be '*beyond the control*' of the Petitioner.

k) The Petitioner has written to several authorities for certified data on the reasons being cited by the Petitioner as being beyond its control. The Petitioner cannot be permitted to follow such an approach. The Petitioner should first get certified data and thereafter make its case. It cannot be that the Petitioner will submit its own data without any authentication and claim huge amounts from the beneficiaries and burden this Commission to collect the data to support the Petitioner's case.

Rejoinder of the Petitioner to reply of PSPCL and HPPC

20. KWHEP vide its affidavits dated 30.9.2019 has filed its rejoinder to the replies filed by PSPCL and HPPC and has submitted as under:

a) The energy injected 35.97 MU (3942.22-3906.25 MU), other than saleable scheduled energy, is unscheduled energy generated as per grid requirement under CERC (Deviation settlement mechanism and related matters) Regulation 2014 and is accounted for in the DSM. As such, the Petitioner has made its claim strictly in terms of the Regulations and the contention of the Respondent is wholly misplaced.

b) Entire analysis of data by the Respondents is misconceived. The contention of the Respondent that high silt content and excess flow of water compared to design inflow set off each other without affecting generation is baseless. The contention ignores the aspect of capacity of the plant completely. During heavy silt flow, as per the protocol agreed among KWHEP, NJHPS and NRLDC, the units had to be shut down at some points in time during the period from 25.07.2018 to 24.08.2018. However, whenever improvement in the silt level was observed, the generation was restarted. Total inflow of water under such circumstances, upto the maximum capacity that can be utilized



(considering the machine capacity after silt flushing), has in fact been utilized for generation of power by the Petitioner. The submission can be explained as under:

Particulars	25.07.2018	06.08.2018	12.08.2018
Design energy (MU)	22.80	22.80	22.80
Actual inflow net of mandatory downstream release (Cumeecs)	918.57	712.57	898.79
Maximum inflow usable for 1100 MW (Cumeecs)	440.00	440.00	440.00
Silt flushing (Cumeecs)	15.04	--	--
Inflow available for generation (Cumeecs)	424.96	440.00	440.00
Spillage of inflow (Cumeecs)	493.61	272.57	458.79
Maximum possible generation with the available inflow (MU)	25.06	26.40	26.40
Actual generation at GT (MU)	25.06	25.64	26.26
Excess generation against design generation (MU)	2.26	2.84	3.46
Reason:			
i. for <u>excess</u> generation (MU): Excess inflow from design	2.26	3.30	3.46
ii. for <u>lower</u> generation (MU): Unit outage due to tripping	--	-0.46	--

c) From the above it can be seen that there is no inconsistency in the data and information provided by the Petitioner rather the Respondent has misinterpreted the information to suit its own cause.

d) The excess inflow from design inflow has been cited as a reason for excess generation and not as a reason for shortfall in generation.

e) The seasonal variation in hydrology as indicated by Respondent is not denied. However, in present case, overall annual inflow has been less than the



design or expected inflow of water leading to loss of overall annual design energy generation. This has been claimed in accordance with Regulation 44(6), (7) & (8) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019. Determination of design energy is on the basis design inflow and any loss in generation relatable to less inflow of water than the design inflow is specifically permitted to be recovered under the regulations. The petitioner has lost 495.81 MU in some months, whereas 333.44 MU extra energy is generated in some months, resulting into lower gross generation of 162.37 MU and lower saleable schedule energy of 154.21 MU, only because the quantum of inflow is not constant. This is totally an unforeseen event which no hydro generating station can predict/ estimate. Water spillage is bound to occur beyond the maximum usable inflow, to generate energy corresponding to the installed capacity. All the water inflow beyond 447.57 Cumecs (440 Cumecs to generate 1100 MW + 7.57 Cumecs mandatory downstream release) is bound to spill. For FY 2018-19, the following table may be referred to:

Date	Actual inflow available for generation (Cumecs)	Spillage excluding mandatory downstream release (Cumecs)	Remark
08.06.2018	440.00	136.29	Maximum inflow usable is 440 Cumecs, rest shall be spilled over
09.06.2018	440.00	156.46	
24.07.2018	440.00	477.71	
25.07.2018	424.96	493.61	Out of total 918.57 Cumecs 424.96 Cumecs utilised for energy generation, 15.04 Cumecs was spilled over during the silt flushing of 4.08 Hours (all 4 units), and balance



			478.57 Cumecs was unusable inflow
23.08.18	305.79	516.88	Out of total 822.67 Cumecs 305.79 Cumecs utilised for energy generation, 134.21 Cumecs was spilled over during the silt flushing of 30.57 Hours (all 4 units) and balance 382.67 Cumecs was unusable inflow
24.08.18	273.34	469.62	Out of total 742.96 Cumecs 273.34 Cumecs utilised for energy generation, 166.66 Cumecs was spilled over during the silt flushing of 37.30 Hours (all 4 units) and balance 302.96 Cumecs was unusable inflow

f)The shortfall as well as over generation of energy due to increase/ decrease in reservoir level is only to support the Grid stability on account frequency variation. In few instances, the reservoir level is brought to the level of MDDL. The claim of the Respondent that Petitioner is resorting to tweaking with the reservoir level, is totally incorrect. The contention that all inflow in excess of design inflow must be used by the generator for electricity generation instead of spillage is fallacious as it ignores the capacity of the plant. In the present case maximum inflow required for energy generation equal to installed capacity plus 10% overload capacity (maximum allowed to a hydro generator, as per IEGC) is 440 Cumecs, which the Petitioner is utilising towards energy generation. Any inflow in excess of 440 Cumecs shall be spilled over and cannot be used. The petitioner has been able to deliver PAFM of > 95% during FY 2018-19, which itself reflects an efficient operation of the plant. From the above, it can be



concluded that the shortfall in generation is for the reasons beyond the control of the generating station.

g) Approach followed by the Petitioner asking CWC/ NRLDC for the certified data/ information is in no way flawed. IBO Chandigarh (CWC) vide its letter dated 11.09.2019 has already intimated its inability to provide certification of inflow data. NRLDC has also refused stating that there is no provision under the CERC Regulations to certify the specific data of the generating stations.

Analysis and Decision

21. The Design Energy of the instant generating station is 4131.06 MU. Actual generation at the generation terminal is 3968.69 MU. As such, shortfall with respect to design energy which is also reckoned and calculated at the generator terminal, works out to 162.37 MU.

22. The petitioner has submitted the following breakup of total shortfall of 162.37 MU:

	(In MU)
Less inflow from design inflow	-590.58
Excess inflow from design inflow	512.10
Less generation by increasing reservoir level	-4.46
Excess generation by depleting reservoir level	10.25
silt flushing	-88.07
Unit outages	-1.61
	-162.37

23. In our view, shortfall with respect to design energy may occur due to following reasons:

a) Actual inflows during the year of operation being less than inflows of the design year.



- b) Excessive Spillage.
- c) Inefficient operation of the plant due to which the generator has not been able to utilize the full potential of the actual inflows.
- d) Energy lost due to Plant stoppage for silt flushing.
- e) Energy lost due to unit outages including planned and forced outages.
- f) Variation in reservoir level to generate additional energy or reduce energy generation.

24. Accordingly, we analyse the data as submitted by the petitioner in the following paragraphs.

Actual inflows during the year of operation being less than inflows of the design year

25. The Commission vide letter dated 07.09.2019 directed the Petitioner to submit the data of average actual inflows for the FY 2018-19 certified by CEA/CWC. The petitioner vide its affidavit dated 12.09.2019 has submitted that IBO vide its letter dated 11.09.2019 has intimated that IBO does not maintain any hydrological observation site which measures the river inflows into the instant project. Hence, IBO is not in a position to recommend the release of the requested data.

26. In order to establish the lower inflows, petitioner in response to the Commission's direction has submitted the rainfall data of the year 2014-15 to 2018-19 as reported by IMD for its Kalpa site in Kinnaur, nearest to Karcham Wangtoo HEP.

27. The above data as submitted by the petitioner pertains to a particular site of the Kinnaur District. As such, to capture the wider picture, we have downloaded the



rainfall data issued by the Indian Metrological Department (IMD) in respect of Kinnaur District for the year 2018 which is as follows:

- a) The District Rainfall, in millimetres (R/F) is the arithmetic averages of Rainfall of Stations under the District.

(In mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	1.8	36.8	74.6	40.1	36.0	24.9	51.9	24.5	78.8	0.0	35.7	13.3

- b) % deviation of rainfall from the long period averages of rainfall for the district:

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	-98	-66	-35	-48	-48	-31	-33	-31	-70	11	-100	-13

28. 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.”

29. Perusal of the above tabulated rainfall data (available data on IMD website from April 2018 to December 2018) as per IMD report with data of actual inflows submitted by the petitioner, indicates that there is low rainfall in comparison to long



period averages for the period from April 2018 to December 2018 except for the month of October, 2018.

30. Further, inflow of water in snow fed rivers like the one on which the instant station of the petitioner is situated also depends on the snowfall in its catchment area during the previous year. The Petitioner has submitted that the total catchment area of the Satluj above the Bhakra dam site and Karcham dam site are about 56875 sq. km. and 48755 sq. km respectively, but the snow catchment area of river Satluj is 38760 sq.km, which is about 80% of the catchment area above Karcham dam site.

31. The petitioner has submitted that the year 2017-18 had very meagre snowfall in Beas as well as Satluj snow catchment area as compared to earlier years. In fact, the snowfall during 2017-18 was the lowest in past 6 years. As a result, in the year 2018-19, river Satluj had low inflows as compared to previous years. To substantiate the same, the petitioner has submitted the monthly report of Bhakhra Beas Management Board for the month of March 2019 on “Operation and Maintenance of RTDSS for Operational Management of Reservoirs of BBMB”. Relevant para of the report is extracted as under:

“2. Snow accumulation report

Summary of Snow Accumulation in Satluj and Beas Catchment in terms of Volume (MCM):

	Area	SWE (MCM)	- SWE (MCM)				
Catchment	Sq. Km	Till 31/3/2014	Till 31/3/2015	Till 31/3/2016	Till 31/3/2017	Till 31/3/2018	Till 31/3/2019
Beas	12603	1767	1841	1162	1367	789	2706
Satluj	53611	5765	7966	4199	5533	2444	11488

.....”



32. From the above data as submitted by the Petitioner, it is observed that that the Snow Water Equivalent in March 2018 is the least during the last 4 years for Satluj Catchments. As a result, the inflows in the river during the month of April 2019 and May 2019 when the snow starts to melt were less as compared to design year inflows (which represent inflows in 90% dependable year), as a result of which that the major shortfall in energy to the tune of 396.31 MU occurred in these two months itself. The same is shown in the following table:

Month	Design Energy	Actual Generation FY 2018-19 (GT)	Shortfall/ (Excess)
1	2	3	4=2-3
	MU		
Apr	237.63	147.00	90.63
May	577.82	272.14	305.68

33. Eventually, at the end of the year, the shortfall due to lower inflows reduced as the petitioner was utilising 110% of the installed capacity for generation during the peak season.

34. In view of the above, we hold that lower inflows (on overall basis) in comparison to design year inflows was one of the reasons of energy shortfall. Its quantification is being dealt in following paragraphs.

Excessive Spillage

35. The Respondents have pointed out that the Petitioner has not been able to utilise the full potential of the inflows during the period from 25.7.2018 to 24.8.2018, as high spillages were observed in the 365 days data submitted by the Petitioner. In



this respect, we observe that in the instant case, as per technical parameters, whenever the inflows are more than the 440 cumecs (excluding mandatory discharge of 7.38 cumecs) corresponding to maximum possible generation at 110% PLF, spillage is bound to occur. From the scrutiny of the 365 days data as submitted by the Petitioner, it is noticed that there were 72 days when spillage has occurred. These are the days when the inflows were in excess of 440 cumecs i.e. the maximum possible inflow which can be accommodated by the machines generating at 110% of plant's installed capacity. Out of these incidents, 9 days spillage was due to high silt. We observe that on 06.08.2018, spillage was due to machine outages and the corresponding energy shortfall is attributable to the petitioner. As such, the contention of the Respondents that the spillage during certain days indicates that Petitioner has not been able to utilize the full potential of the inflows, is not relevant except one day i.e. 06.08.2018.

Inefficient operation of the plant due to which the generator has not been able to the utilize the full potential of the actual inflows/ Energy lost due to Plant stoppage for silt flushing/ Energy lost due to unit outages including planned and forced outages/ Variation in reservoir level to generate additional energy or reduce energy generation

36. In order to assess whether the petitioner has been able to extract the full potential of the actual inflows, we observe as follows:

- a) The maximum possible energy generation corresponding to the actual inflows for the year 2018-19 has been worked out by the petitioner as follows:

Maximum Possible Generation during a day (MU) = (Actual inflow available after mandatory discharge restricted to 440 cumecs) * 0.024/ 0.4



Where, 440 cumecs is the design discharge corresponding to 110% of the installed capacity, 0.024 (MU/MW) is the energy generated corresponding to 1 MW in 24 hours.

0.4 (cumecs/MW) is the design discharge for producing 1 MW at generator terminal.

b) The above methodology proposed by the petitioner is acceptable in terms of technical parameters as adopted by CEA for arriving at the design energy of the station and accordingly, we adopt the same for our further calculations.

c) Maximum possible generation worked out by the petitioner is 3954.97 MU at generator terminals. It is noticed that during 9 instances when there was high silt/ silt flushing, the petitioner has deviated from the above methodology and has indicated the maximum possible generation during these instances as the actual generation done during the period restricting daily maximum possible generation as daily design energy of 22.80 MU. However, for our calculations, maximum possible generation for these days also, the formulae as above has been retained as the loss due to silt shall be considered separately.

d) The petitioner has considered actual aquatic releases, which are on higher side in comparison to the fixed release of 7.38 cumecs as approved by the CEA during finalization of Design Energy. Accordingly, while calculating the maximum possible generation we have considered constant aquatic release of 7.38 cumecs throughout the year.

37. Based on the above, the maximum possible generation, before the impact of unit outages, silt flushing and other reasons of energy shortfall as claimed by the petitioner are considered, as worked by us is 4076.63 MU. The difference of 54.43 MU (4131.06-4076.63) between the design energy and the above maximum possible



generation worked out on the basis of actual inflows (being less than the design year inflows) represents the energy short fall due to less inflow.

38. During the 9 instances when there was high silt/ silt flushing, we have considered the maximum possible generation as 26.4 MU per day i.e. maximum possible generation while operating at 110% of installed capacity as during these days the inflows were more than 440 cumecs. According to the petitioner's submission, during these nine days units were out for 438 hours 13 minutes (machine hours) due to silt flushing. However, as per the NRLDC data extracted from their website, total outage hours due to silt are 434 hours 5 minutes (machine hours) i.e. 434.08 hours. As such, the energy lost by the plant due to silt flushing during these nine days works out to 119.37 MU $\{26.4 \times 9 \times 434.08 / (24 \times 9 \times 4)\}$. Accordingly, after considering the energy loss due to silt flushing, the petitioner could have generated 3957.26 MU (4076.63-119.37) before other reasons of shortfall i.e. unit outage are considered.

39. 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 Petitioner vide ROP of the hearing dated 11.12.2019 was directed to furnish the planned and forced outage data certified by CEA for the year 2018-19 along with its correlation with energy generation. In response, the Petitioner vide affidavit dated 27.12.2019 has submitted that it has requested to NRPC and CEA for certification of planned and forced machine outage data and the same is yet to be



certified by the NRPC/ CEA. From the Petitioner's submission of planned annual maintenance and machine outage for the year 2018-19, it is noticed that there were 64 events of outages which includes 61 events of planned outages and 3 events of forced outages. Details of the planned/ forced outages are as follows:

Events	Design Energy (MU)	Spillage (Cumeecs)	Maximum possible generation based on actual inflow available (MU)	Actual Generation at GT (MU)	Energy shortfall (MU)	Shortfall Beyond control of Power Station	Shortfall Within control of Power Station	Reasons
61	262.76	0.0	220.02	220.45	-42.74	42.30	0.02	-42.30 MU claimed by the petitioner for reason of less inflow from design inflow.

40. From the above data, we note that during 61 events of planned outages, actual inflows were less than the corresponding design inflows. During these instances of lower inflows, the maximum possible generation was same as the actual generation i.e. 220.02 MU, against the design energy of 262.76 MU. Therefore, 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 42.30 MU during these 61 instances was solely attributable to less inflow and has been accounted for at para 37 above. With regard to non-certification of the planned outage data by CEA/NRPC, Commission is of the view that the same does not have material impact on the extent of shortfall as the planned outage was carried out during the lean season and the petitioner was able to generate to full potential of available inflows.



41. Petitioner has submitted three incidences of unit tripping i.e. on 31.05.2018, 06.08.2018 and 26.03.2019. However, from the NRLDC site only one incidence of unit tripping, out of three submitted by the petitioner, is verifiable. As such, considering the fact that petitioner has submitted more numbers of tripping in comparison to what is available at NRLDC site, we are basing our calculations on submission of the petitioner in absence of non-certification of the data by CEA.

42. Petitioner has claimed generation loss of 1.613 MU against the unit tripping for three days. However, based on the actual inflows, generation loss for these three days corresponding to outage hours works out to 1.275 MU. The difference may be due to unit tripping during peak hours. As such, the figure of energy loss as claimed by the petitioner being on higher side is being considered for further calculations. Accordingly, considering the loss due to machine outages, maximum possible generation at generator terminal works out to 3955.65 MU (3957.26-1.61) before consideration of the energy produced/ lost by the petitioner by depleting/ raising the reservoir level.

43. Petitioner has claimed the following in respect of the additional energy generated by it by depleting the reservoir level and energy lost due to raising of the reservoir level:

	(In MU)
Less generation by increasing reservoir level	-4.46
Excess generation by depleting reservoir level	10.25
	5.79

On perusal of the data submitted by the petitioner, the same is in order.



44. As such, after considering all the reasons which have impacted the energy generation, maximum possible generation based on the calculations work out to 3961.44 MU (3955.65 +5.79) against the actual generation of 3968.69 MU.

45. In view of the above deliberations, we are of the view that petitioner has been able to utilize the full potential of actual inflows available for energy generation. However, shortfall with respect to design energy has occurred due to less inflows, plant stoppage for high silt/ silt flushing, unit outages and excess generation on overall basis due to management of reservoir level.

46. Commission is of the view that out of the above reasons, energy lost due to less inflows and plant stoppage due to high silt/ silt flushing are not within the control of the petitioner. The energy lost due to unit outages is not beyond the control of the petitioner and petitioner cannot be compensated for the same. Further, the additional energy generated due to management of reservoir level was also within the control of the petitioner. As such, the same shall be a considered part of the maximum possible generation at the generator terminal.

47. Accordingly, following energy should have been generated after accounting for the reasons within the control of the petitioner:

	(In MU)
Actual energy generated at the generator terminal	3968.69
Add: Energy lost due to unit outages	1.61
Total energy which should have been generated at generator terminal after accounting for the reasons within the control of the petitioner	3970.30



48. The above generation of 3970.30 MU is the energy which petitioner should have generated at generator terminal. However, as per Regulation 44(6) of the 2019 Tariff Regulations, energy shortfall has to be calculated at ex-bus i.e. difference between saleable scheduled energy (ex-bus) and saleable design energy (ex-bus). It is noticed that the petitioner has generated 35.97 MU as unscheduled energy which has been accounted as per DSM Regulations. Respondents PSPCL and HPPC have submitted that the quantification of shortfall in saleable energy (ex-bus) against the saleable design energy (ex-bus) during FY 2018-19 by the Petitioner is also advanced on the basis of incorrect presumptions and inconsistencies in as much as 35.97 MU of energy was over-injected by the Petitioner as compared to the scheduled energy. Respondents have further submitted that against the sale to the long term beneficiaries including PSPCL, the Petitioner has injected 3942.22 MU against the scheduled injection of 3906.25 MU. Therefore, at least to the extent of 35.97 MU, there can be no question of energy shortfall towards the energy being supplied to the long-term beneficiaries and this quantum should be adjusted against the claimed shortfall.

49. The petitioner has stated that the energy injection of 35.97 MU, other than saleable scheduled energy, is unscheduled energy generated as per grid requirement under CERC (Deviation settlement mechanism and related matters) Regulations, 2014 and is accounted for in the DSM.



50. In this regard, Commission is of the view that the unscheduled energy of 35.97 MU (around 1% of the saleable design energy) has been generated by the generator as per requirements of the grid and the corresponding frequency based incentive for such injection is governed by provisions of DSM Regulations, 2014. As such, the Commission does not agree with the submission of the respondents that the unscheduled energy of 35.97 MU should be adjusted against the claimed shortfall.

51. Accordingly, saleable schedule energy and saleable design energy at ex-bus are worked out as follows:

	(in MU)		
	Design	As claimed by the petitioner	As per CERC
Design Energy/ Maximum possible generation at generator terminal (A)	4131.06	3968.69	3970.30
Auxiliary Energy consumption (AEC) (B)	49.57	26.47	26.48
	(@ 1.2%)	(actual AEC @ 0.67%)	(actual AEC @ 0.67%)
Saleable energy at ex-bus (C)= (A)-(B)	4081.49	3942.22	3943.82
DSM/ UI on account of grid requirement (D)	-	35.97	35.97
Free power to GoHP @12% of saleable energy (FEHS) (E)=[(C)-(D)]x0.12	489.78	468.75	468.94
Net Saleable energy (F)=(C)-(D)-(E)	3591.71	3437.50	3438.91
Shortfall with respect to saleable design energy		154.21	152.80

52. In view of the above deliberations, Commission is of the view that energy shortfall of 152.80 MU is for the reasons beyond control of the Petitioner and



accordingly, the Petitioner is entitled for the corresponding energy charge shortfall as given below:

Approved AFC for FY 2018-19 (A)	Rs. (in lakh)	125233.78
Energy Charges recoverable (B) = [0.5 of (A)]	Rs. (in lakh)	62616.89
Approved saleable design energy (C)	MU	3591.71
Energy charge rate (as per regulation 44(5) of CERC Tariff Regulations, 2019) (D)= (B)/ {(C)*10}	Rs. Per kWh	1.743
Shortfall allowed (E)	MU	152.80
Energy charges allowed to be recovered (F)=(D)*(E)*10	Rs. (in lakh)	2663.30

53. Accordingly, in terms of Regulation 44(7) of the 2019 Tariff Regulations, we allow the energy charge shortfall of Rs. 2663.30 lakh for the period 2018-19 and the same shall be recovered by the petitioner in six equal monthly instalments. Further, the difference in energy charge shortfall to be recovered for the year 2018-19 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.

54. Petition No.184/MP/2019 is disposed of in terms of above.

Sd/-
(I S Jha)
Member

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

Sd/-
(P. K. Pujari)
Chairperson

