Central Electricity Regulatory Commission
New Delhi

Petition No.144/MP/2018

Coram:

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

Date of Order: 20.11. 2019

In the matter of

Application under Regulation-31(6) of CERC (Terms and Conditions of Tariff) Regulations, 2014 for recoupment of under-recovered energy charges due to shortfall in energy generation for reasons beyond the control of generating station during the FY 2014-15 in respect of Rangit Power Station.

And

In the matter of

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

…Petitioner

Vs

1. West Bengal State Electricity Distribution Company Ltd,
Bidyut Bhawan (8th floor)
Block-dj, sector-ii, salt lake,
Kolkata – 700 091 (West Bengal)

2. Damodar Valley Corporation,
DVC towers, VIP road,
Kolkata – 700 054 (West Bengal)

3. Jharkhand State Electricity Board,
Doranda, Ranchi,
Jharkhand – 834 002 (Jharkhand)

4. North Bihar Power Distribution Company Ltd.,
Vidyut Bhawan, Bailey Road,
Patna – 800 001 (BIHAR)

4. South Bihar Power Distribution Company Ltd.,
Vidyut Bhawan, Bailey Road,

Patna – 800 001 (BIHAR)
5. Department of Power,
Govt. of Sikkim, Kazi road,
Gangtok-737101 (SIKKIM) **...Respondents**

Parties present:

Shri Prashant Kaul, NHPC
Shri A.K. Pandey, NHPC
Shri V.N. Tripathi, NHPC
Shri Jitender Kumar, NHPC
Shri Piyush Kumar, NHPC
Ms. Seema Mishra, NHPC
Shri Dhanush C.K, NHPC
Shri M.G. Ramachandran, Senior Advocate, WBSEDCL
Ms. Tanya Sareen, Advocate, WBSEDCL
Ms. Anushree Bardhan, Advocate, WBSEDCL

ORDER

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

> *(a) Hon'ble Commission may kindly allow recovery of energy charges amounting to ₹ 2.73 Crores in FY 2016-17 against the shortfall in generation of 8.36 MU in FY 2014-15 as per regulation 31(6)(b) of CERC Tariff Regulations, 2014 as explained in para- IX & XI.*
>
> *(b) Hon'ble Commission is requested to allow modified design energy for FY 2016-17 so that the recovery of allowable energy charges is assured as explained in Para-XII.*
>
> *(c) To allow revision of energy bills for the period 2016-17 which were already raised to beneficiary for recovery of energy charges.*
>
> *(d) To allow issuance of supplementary bill for difference in energy charges directly to beneficiaries after truing up of tariff as mentioned in Para-X.*
>
> *(e) Pass such other and further order / orders as are deemed fit and proper in the facts and circumstances of the case.*

2. Rangit Power Station (hereinafter referred to as the generating station) located in the State of Sikkim comprises of three units of 20 MW each. The generating station was declared under commercial operation on 15.2.2000. The approved annual Design Energy (DE) of the generating station is 338.61 MU and keeping in view the provision of auxiliary losses (1.0%) and Free Power to the home state (12%), the saleable energy works out to be 294.997 MU.

3. The provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as "the 2014 Tariff Regulations") dealing with recovery of energy charge shortfall in respect of hydro-generating stations are as under:

> *"31(6) In case the actual total energy generated by a hydro generating station during an year is less than the design energy for reasons beyond the control of the generating station, the following treatment shall be applied on a rolling basis on an application filed by the generating company:*
>
> (b) *In case the energy shortfall occurs after ten years from the date of commercial operation of a generating station, the following shall apply.*
>
> *Explanation: Suppose the specified annual design energy for the station is DE MWh, and the actual energy generated during the concerned (first) and the following (second) financial years is A1 and A2 MWh respectively, A1 being less than DE. Then, the design energy to be considered in the formula in clause (5) of these regulations for calculating the ECR for the third financial year shall be moderated as (A1 + A2 – DE) MWh, subject to a maximum of DE MWh and a minimum of A1 MWh.*

Submissions of the Petitioner

4. Rangit Power Station was declared under Commercial operation w.e.f. 15.02.2000 and has already completed more than 10 years of operation. The Petitioner in this petition has submitted as under:

(a) The actual generation of the generating station during FY 2014-15 and FY 2015-16 is as under:

Actual Generation during FY 2014-15	A1	327.66 MU
Actual Generation during FY 2015-16	A2	345.25 MU
Design Energy	DE	338.61 MU

(A1+A2–DE) = (327.66 + 345.25 – 338.61) = 334.30 MU

It is clear from above that, (A1+A2–DE) i.e. 334.30MU is less than the Design Energy of the Project (338.61MU). Hence, as per Regulation 31(6) (b) of the 2014 Tariff Regulations, the Energy Charge Rate (ECR) for FY 2016-17 needs to be modified so as to ensure recovery of under recovered energy charges of FY 2014-15.

(b) The present petition has been filed in order to suitably modify the Energy Charge Rate (ECR) in terms of Regulation 31(6)(b) of the 2014 Tariff Regulations for FY 2016-17 for recovery of under-recovered energy charges in FY 2014-15 due to shortfall in generation. The

month wise breakup of actual generation vis-à-vis Design Energy is tabulated below:

S. No.	Month	Design Energy (MU)	Actual Generation at GT (MU)	Shortfall/ Excess (MU)	Actual PAF (%)
1	**2**	**3**	**4**	**5=4-3**	**6**
1	Apr-14	22.83	14.15	-8.68	99.36
2	May-14	30.29	23.93	-6.36	98.96
3	Jun-14	41.04	37.33	-3.71	101.22
4	Jul-14	42.41	44.85	2.44	102.69
5	Aug-14	42.41	43.32	0.91	102.69
6	Sep-14	41.04	43.57	2.53	101.63
7	Oct-14	40.10	41.54	1.44	102.69
8	Nov-14	24.44	24.28	-0.16	99.38
9	Dec-14	15.04	18.25	3.21	84.56
10	Jan-15	13.46	12.06	-1.40	64.49
11	Feb-15	11.88	10.94	-0.94	72.75
12	Mar-15	13.67	13.44	-0.23	72.64
Total		**338.61**	**327.66**	**-10.95**	

(c) There is a total shortfall of 10.95 MU (338.61 MU – 327.66 MU) in generation during FY 2014 -15. The breakup of the shortfall is as follows:

(In MU)

Sl No	Description	
	A. Shortfall due to reasons beyond the control of petitioner	
i	Energy shortfall due to less inflow from design inflow	(-) 18.69
ii	Energy generated due to excess inflow from design inflow	16.62
iii	Energy loss due to silt flushing	(-) 2.30
iv	Energy loss due to high trash	(-) 1.10
v	Energy loss due to high silt	(-) 2.88
	Total (A)	(**-**) **8.36**
	B. Shortfall due to reasons within the control of petitioner	
i	In order to meet grid requirement (excess generation), the petitioner has to deplete the reservoir level with marginal increase in generation and had to operate the machines at lower head. Subsequently, at appropriate time, the reservoir level has been maintained with less generation.	
ii	Energy generated by depleting reservoir level on some days	9.15
iii	Less generation for increasing reservoir level on some days	(-) 6.85
iv	Unit Outage	(-) 2.43
v	Other constraint (Partial load/ramping up/down during peaking	(-) 2.46

	etc.	
	Total (B)	(-) **2.59**
	Grand Total (A+B)	(-) **10.95**

Out of total shortfall of 10.95 MU, the reasons for shortfall of 8.36 MU are beyond the control of petitioner and reasons for balance 2.59 MU are within the control of the petitioner. Generation shortfall of 8.36 MU due to reasons beyond control of the petitioner needs to be allowed to be recovered during FY 2016-17.

(d) The present submission for recovery of energy charges is based on the energy charge allowed for the year 2014-15 vide order dated 06.01.2016 in petition no. 232/GT/2014 as under:

Schedule Energy (Ex-Bus) (MU)	**Free* Energy (MU)**	**Net Energy Billed (MU)**	**ECR (₹/Unit)**	**Annual Fixed Charges (₹ Crore)**	**Energy Charges to be recovered ((₹ Crore)**	**Energy Charges actually recovered ((₹ Crore)**	**Under recovery of Energy Charges (₹ Crore)**
1	**2**	**3=1-2**	**4**	**5**	**6=50% of 5**	**7=3*4/10**	**8=7-6**
310.73	37.29	273.44	1.66	97.93	48.97	45.39	-3.57

Energy charges amounting to ₹ 45.39 Crore have been recovered during 2014-15 corresponding to scheduled ex-bus energy of 310.73 MU, against energy charges of ₹ 48.97 Crore to be recovered. As such, there are unrecovered energy charges of ₹ 3.57 Crore.

(e) As out of the total loss of 10.95 MU, the loss of 2.59 MU was not uncontrollable, shortfall of energy charges amounting to ₹ 2.73 Crore corresponding to 8.36 MU only may be allowed, which was due to reasons beyond the control of the Petitioner. Details are as under:

Sl No	Description		Amount / MU
1	Total Shortfall in generation during FY 2014-15	A	10.95 MU
2	Total under- recovery of energy charges during FY 2014-15	B	₹ 3.57 Crore
3	Shortfall in generation due to reasons beyond control	D	8.36 MU
4	Shortfall in energy charges to be recovered during FY 2016-17	E=D*B/A	**₹ 2.73 Crore**

(f) Under prevailing mechanism of Regulation 31(6) of the 2014 Tariff Regulations, the

Petitioner is not in a position to recover the shortfall allowed by CERC. For example, in case of order dated 17.04.2017 in petition no. 251/MP/2015 for Chamera-III Power station for FY 2014-15, the petitioner could only recover ₹ 14.92 Crore against allowed recovery of ₹ 19.04 Crore. The above situation is applicable in the instant case also.

(g) Further, CEA and CWC were requested to certify the actual inflow data of Rangit Power station but vide letter dated 31.01.2017, they have expressed inability to certify the inflow series on year to year basis as under:

> "*The hydrological uncertainties on year to year basis are part of the planning process which can be assessed from the departure of the annual rainfall from the normal. Further the consistency of inflow series of the project can be carried out using relevant hydro-meteorological data for longer period such as more than 5 years. In view of the above it may not be possible to certify the inflow series as requested vide above referred letter.*"

5. The Commission directed the Petitioner to submit additional information vide technical validation letter dated 29.11.2018 as under:

> *(a) Rainfall data to co-relate low inflows reported by Indian Metrological Department for the district in which the plant is situated and for the adjoining districts.*
>
> *(b) Planned and forced machine outage data certified by CEA/NRLDC and its correlation with energy generation data vis-a-vis available average inflows during the period of such outage.*

6. In compliance with the above directions, the Petitioner has submitted the additional information vide affidavit dated 14.1.2019 with an advance copy to the Respondent also.

Reply of WBSEDCL, Respondent

7. In response to above, the Respondent, WBSEDCL vide its affidavits dated 9.1.2019 and 13.2.2019 has requested the petitioner for following additional information:

(a) Detailed Project Report.

(b) Reconciliation statement of billing for the year 2014-15, indicating the energy scheduled, energy charges billed, the shortfall in recovery of energy charges and any other detail required to arrive at the amount of shortfall as indicated in the petition.

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

8. Respondents has submitted that the energy charge shortfall as claimed by the NHPC for the financial year 2014-15 in the financial year 2016-17 may be dealt as per Regulation 31 (6) (b) of the 2014 Tariff Regulation which is as under:

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

Explanation : Suppose the specified annual design energy for the station is DE MWh, and the actual energy generated during the concerned (first) and the following (second) financial years is A1 and A2 MWh respectively, A1 being less than DE. Then, the design energy to be considered in the formula in clause (5) of these regulations for calculating the ECR for the third financial year shall be moderated as (A1 + A2 – DE) MWh, subject to a maximum of DE MWh and a minimum of A1 MWh."

9. WBSEDCL submitted that NHPC has so far not placed on record the Detailed Project report (DPR) of the Rangit Station despite several requests made during proceedings. The DPR would disclose the aspects such as the factoring any of the requirement to undertake steps towards Silt Flushing, High trash, high silt etc. Since NHPC has deliberately not filed the DPR before the Commission and has also not made it available to WBSEDCL, adverse inference need to be drawn to the effect that many of the aspects on which NHPC is claiming relief may be covered as being already factored in the establishment of the Rangit Station. Accordingly, WBSEDCL has submitted that the claims raised by NHPC on account of the above reason needs to be rejected.

10. WBSEDCL has submitted that NHPC has not given the entire data relating to operation of the generating station to enable the Commission to consider the claim of NHPC in a transparent manner and by application of the requisite prudent check. NHPC has not submitted the daily discharge data for the generating station for the FY

2014-15 and FY 2015-16 certified by the Central Electricity Authority (CEA)/Central Water Commission (CWC). WBSEDCL has specifically sought for such information from NHPC during proceeding before the Commission. Without prejudice to the above, Government of West Bengal sought for the daily discharge data from the Central Water Commission (CWC) vide letter dated 12.2.2019.

11. WBSEDCL has submitted that it is not in a position to make any submissions with regard to the daily discharge data until the data is provided by NHPC is duly certified by CWC for the relevant period. It has submitted that even in the proceedings before this Commission, WBSEDCL has specifically sought for the daily discharge data from NHPC to ascertain the actual daily inflow but the same has not been provided by NHPC duly certified from the CEA / CWC. This Commission has been giving directions to NHPC to provide such data duly certified by the CEA/CWC in other cases of NHPC, namely, vide Order dated 17.4.2017 passed in Petition No.251/MP/2015 relating to Chamera Hydro Electric Project. WBSEDCL has also written letters dated 18.1.2019 and 5.2.2019 to NHPC to provide the data.

12. WBSEDCL has submitted that though NHPC has provided the Rainfall data as available in the website of the Indian Meteorological Department for the Gyalshing, Sikkim and Namthang, South Sikkim but NHPC has not provided the Rainfall Data of the catchment area where the Rangit hydro plant is located in spite of direction of the CERC vide ROP dated 11.1.2019.

13. WBSEDCL has submitted that NHPC has claimed shortfall in generation on account of silt flushing. WBSEDCL denies the claim, as NHPC has not provided with the DPR which will assist this Commission and WBSEDCL in verifying the claim of NHPC, the mechanism of measuring the actual silt content in the river, the design silt content for which the plant was already equipped etc. As noted in the other petitions

filed for the TLDP – III and IV plants of NHPC, the silt flushing is a part of normal operation of barrage in the Hydro Electricity Power Plant to maintain water retaining capacity of the reservoir and same was envisaged in their respective DPRs. In view of the above, NHPC ought to provide with copy of the DPR for the Rangit Station.

14. Even with regard to high trash, the DPR of Rangit Station is necessary to ascertain whether Trash Rack Cleaning Machine (TRCM) had been duly considered in the DPR as a part of the project cost. This will be important for calculating shortfall in generation on account of high trash if at all admissible. NHPC cannot choose not to provide for the DPR and at the same time seek recovery on account of high trash. It is well settled principle that a party cannot take advantage of its own wrong.

Rejoinder of the Petitioner to reply of WBSEDCL

15. In response to the reply of respondent WBSEDCL, NHPC vide its affidavits dated 21.2.2019 and 22.2.2019 has submitted as under:

16. The petitioner has submitted that respondent, WBSEDCL has correlated operational problem with design aspect of the project and has insisted for submission of copy of DPR. In this respect, it has submitted that DPR of Rangit Power Station was prepared in 1982 and CCEA approval was accorded on 17.4.1990. The project is under commercial operation since last 20 years. The questioning of design aspects of Rangit Power Station at this stage is not justified. The requirement of DPR at this stage was discussed during hearing on 2.5.2019, when it was appraised that DPR of Rangit power Station is not readily available and same cannot be provided. The heavy silt during monsoon season is regular phenomena and due to environmental reasons, the problem of trash is also increasing. So, the problem is to be attended as per requirement. The petitioner has submitted that the Rangit Power station declared commercial operation on 15.02.2000, copy of DPR was submitted along with original petition at the time of COD of

the project. CEA worked out the Design Energy (DE) 338.61 MU. Present petition is for recovery of shortfall in energy charges.

17. The petitioner has submitted that the daily discharge data has already been provided along with submitted petition. NHPC has requested CEA/CWC to certify actual inflows of Rangit Power Station. CWC vide letter dated 23.1.2017 has shown its inability to certify the inflow series as requested.

18. The petitioner has submitted that the operational aspect of silt flushing process during monsoon is not clear to the respondent and, it has no direct link with DPR. The Basic objective of silt flushing is to maintain long and useful life of the project. It is necessary that the sediment entering in the reservoir is not allowed to settle down in the reservoir. For this purpose it is necessary to flush reservoir sediment as frequently as possible during monsoon season. Accordingly, generating station has to carry out reservoir silt flushing during monsoon season when discharge exceeds 1500 cumecs. As per NHPC Reservoir Operation Manual also, if during the month of May and October discharge exceeds 1500 Cumecs, the flushing shall be resorted to in these months as well. To achieve the appropriate level of silt concentration, generally the silt flushing period is 20 Hrs. However, in case of very high silt content, the silt flushing period has sometimes been extended to more than 20 hrs (sometimes 40 to 80 hrs also), details of which is already submitted in daily analysis. Therefore, on account of higher discharge/ very high silt conditions, the flushing takes more time and is factored under reasons beyond control of the Power Station as these silt/sedimentation mitigation measures accrue benefit to the beneficiaries only.

19. The petitioner has submitted that planned and forced machine outage certified by CEA and its correlation with energy generation data viz.a-viz available average inflows

during the period is already submitted to the Commission on 15.1.2019 in compliance to letter dated 29.11.2018 with advanced copies to the beneficiaries.

Analysis and Decision

20. Rangit Hydro Power Station is under commercial operation since 15.02.2000 and the Design Energy of the generating station is 338.61 MU. It has already completed more than 10 years of operation. The actual generation during the FY 2014-15 was 327.66 MU and in FY 2015-16, it was 345.25 MU. As per clause 31 (6) (b) of the 2014 Tariff Regulations, "In case the energy shortfall occurs after ten years from the date of commercial operation of a generating station, the following shall apply:

Explanation: *suppose the specified annual design energy for the station is DE MWh, and the actual energy generated during the concerned (first) and the following (second) financial years is A1 and A2 MWh respectively, A1 being less than DE. Then, the design energy to be considered in the formula in clause (5) of these regulations for calculating the ECR for the third financial year shall be moderated as (A1 + A2 – DE) MWh, subject to a maximum of DE MWh and a minimum of A1 MWh."*

21. Loss of generation during FY 2014-15 claimed by the petitioner is 10.95 MU. Of this shortfall, the Petitioner has claimed that energy loss of 8.36 MU was beyond its control while balance energy loss of 2.59 MU was not uncontrollable. The Petitioner has invoked provisions of Regulation 31(6) (b) of the 2014 Tariff Regulations to claim relief for the shortfall of 8.36 MU.

22. The break-up of unclaimed generation loss (2.59 MU) by the Petitioner is as under:

(a) Energy generated by depleting reservoir level on some days: 9.15 MU.

(b) Less energy generated for increasing reservoir level on some days: (-) 6.85 MU.

(c) Unit outage: (-) 2.43 MU.

(d) Other constraint (Partial load/ramping up/down during peaking etc.: (-) 2.46 MU.

23. The break-up of loss of generation 8.36 MU claimed by the Petitioner on account of uncontrollable factors is as under:

(a) Energy shortfall due to less inflow from Design Inflow: (-) 18.69 MU.

(b) Energy generated due to excess inflow from Design Inflow: 16.62 MU.

(c) Energy loss due to silt flushing: (-) 2.30 MU.

(d) Energy loss due to high trash: (-) 1.10 MU.

(e) Energy loss due to high silt: (-) 2.88 MU.

24. Low generation in comparison to Design Energy in a hydro generating station can be attributable to the following reasons:

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

ii. Prolonged planned/ forced outage of machines.

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

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

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

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

26. The Petitioner was directed to submit IMD rainfall data to correlate low inflows vide ROP dated 11.1.2019. Petitioner had requested CEA vide letter dated 14.12.2016 for certification of inflow data for the year 2014-15. In turn CEA vide letter dated 30.1.2017 showed inability to certify the same. Petitioner also requested Indian Metrological Department, Gangtok vide letter dated 28.12.2016 for rain fall data of the

Gyalshing & Namthang region. Director, Metrological Department, Gangtok vide letter dated 24.3.2017 furnished the requested information to the petitioner. We have analysed the rain fall data of Department of Metrology, Gangtok and data of the South Sikkim downloaded from the IMD website for the year 2014-15. It is evident that there was less rainfall from the normal during the year 2014-15. Also, from the inflow data of 365 days submitted by the petitioner, it is evident that on overall basis there was generation loss of (-) 2.07 MU (– 18.69 MU + 16.62 MU) as given at para no 23 (a) & (b) due to less flows in comparison to Design Inflow over which generating station has no control. Maximum possible generation as claimed by the petitioner for the year 2014-15 based on the actual inflow is 337.54 MU. However, maximum possible generation assessed by us using 100% machine availability is 332.21 MU. As such, maximum possible generation claimed by the petitioner and as assessed by us is less than the Design Energy (338.61 MU). Accordingly, we are of the view that during the year 2014-15 inflows were on the lower side in comparison to Design Inflows.

(ii) Prolonged planned/ forced outage of machines

27. The Petitioner vide affidavit dated 14.1.2019 has submitted that there had been 126 instances of planned / forced outages during the year 2014-15. We note that out of 126 outages, 26 were forced outages due to different reasons such as to carry out MIV seal work, shear pin replacement and field failures etc.

28. It is noticed that there were 100 incidences of Planned outages during which machine was taken under shutdown for Annual Maintenance. It is observed that planned machine outages were taken to carry out annual maintenance work, of units one by one, during lean season when the actual inflows were so less that the full energy potential of the actual inflows could be realized by the availability of two units. However, the petitioner has shown generation loss of (-) 1.58 MU during planned outages which has

been claimed by the petitioner under the reasons within control of the generating station as “less generation for increasing the reservoir level” [as per para 22 (b)].

29. Energy loss due to 26 forced outages as per details submitted by the petitioner is (-) 2.43 MU. However, petitioner is taking the responsibility for this loss and has claimed this shortfall under the reasons within control of the generating station. As such, forced outages have impacted energy generation only to the extent of 2.43 MU (0.7% of design energy) which is quiet reasonable. Accordingly, it is observed that petitioner cannot be faulted for non-maintenance / prolonged outage of the plant resulting to energy loss.

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

30. Maximum possible energy generation for the year 2014-15 has been assessed by us based on actual inflow data submitted by the petitioner, as follows :

Maximum Possible Generation during a day (MU) = (Installed Capacity X 0.024)* Actual Inflow /52

Where installed capacity is 60 MW and 52 cumecs is the design discharge.

31. Based on the above methodology, maximum possible energy generation, during the year 2014-15, which is the sum of daily maximum possible generations during 365 days, works out to 332.21 MU, whereas the petitioner has submitted that the maximum possible generation is 337.54 MU. It is possible that the difference of 5.33 MU is due to petitioner having considered more power generation in favourable conditions. We have, therefore, considered maximum possible generation as 337.54 MU for further calculations.

32. It is observed that spillage is during the days when actual inflows are more than the design discharge of 52 cumecs corresponding to power potential of 60 MW. As

such, petitioner cannot be faulted with the excessive spillage or non-utilization of full potential of actual inflows due to inefficient operation. Against the maximum possible generation of 337.54 MU based on actual inflows, the actual generation is 327.66 MU. The difference has been mapped out by the petitioner between reasons under its control and reasons beyond its control, which are being considered for admissibility in the following paras.

Energy shortfall due to reasons within control of the petitioner

33. During the year 2014-15, 9.15 MU were additionally generated by depleting reservoir and there was generation loss of 6.85 MU for increasing reservoir level to meet the requirement of the grid. As such, there was 2.3 MU (9.15 MU – 6.85 MU) excess generation which petitioner has claimed under reasons within control of the generating station. There was generation loss of (-) 2.43 MU due to unit outages and loss of (-) 2.46 MU has been attributed to other constraints like partial loading and ramping up & ramping down during peaking. However, considering the fact that petitioner has claimed total shortfall of (-) 2.59 MU under reasons within the control of the generating station, we are not inclined to deal it further.

Energy shortfall due to reasons beyond the control of the generating station

Energy Shortfall due to Silt Flushing

34. Petitioner has submitted that loss of energy due to slit flushing is 2.30 MU. In our view the stoppage and the consequent loss of energy to prevent the damage due to high silt level is beyond the control of the generator. Further, considering the fact that the calculation of Design Energy of the hydro plants based on the hydrological series does not take into account the energy lost due to stoppage of plant due to high silt levels / silt flushing, we are of the view that the generator needs to be compensated for the generation loss of 2.30 MU due to silt flushing.

Energy Shortfall due to High Trash

35. Commissioning of Trash Rack Cleaning Machine (TRCM) is a requirement before COD. The petitioner needs to ensure the commissioning of the same on time to avoid the possible loss of energy due to high trash. Petitioner has claimed generation loss of 1.10 MU due to high trash. This generation loss cannot be considered as a reason beyond the control of the generating station.

Energy Shortfall due to High Silt

36. Hydro projects are designed to handle certain PPM level of silt and beyond that level, the generation is required to be stopped till the level comes down to the permissible limits. Petitioner has claimed generation loss of 2.88 MU on account of stoppage of the plant due to high silt. Commission is of the view that the petitioner needs to be compensated for the loss of generation due to high silt.

37. Based on the above and after accounting for the reasons of shortfalls which were beyond the control of the Petitioner and the reasons which the Petitioner has attributed to itself, following has been worked out to assess the possible generation at generator terminal against the actual generation of 327.66 MU.

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

(In MU)

1.	Energy that could have been generated by utilizing available actual inflows and 100% machine capacity i.e. 60 MW as per para 31	337.54
2.	Energy loss due to silt flushing	(-) 2.30
3.	Energy loss due to high silt	(-) 2.88
4.	Remaining Energy that could be generated	332.36

38. The Commission is of the view that the Petitioner is entitled to be compensated for the energy shortfall due to reasons which were not under the control of the generating station, which works out to 6.25 MU (338.61 MU – 332.36 MU) i.e. the

difference between Design Energy and maximum possible energy generation after accounting for the reasons beyond control of Petitioner.

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

Schedule Energy (Ex-Bus) (MU)	Free Energy (MU)	Net Energy Billed (MU)	ECR (₹ /Unit)	Annual Fixed Charges (₹ Crore)	Energy Charges to be recovered (₹ Crore)	Energy Charges actually recovered (₹ Crore)	Under recovery of Energy (₹ Crore)
1	**2**	**3=1-2**	**4**	**5**	**6=50% of 5**	**7=3*4/10**	**8=7-6**
310.73	37.29	273.44	1.66	97.93	48.97	45.39	-3.57

40. Therefore, the amount to be recovered in the FY 2016-17 due to shortfall in energy generation from the Design Energy during the FY 2014-15 works out as follows:

Sl No	Description		
1.	Total Shortfall in generation during FY 2014-15 (MU)	A	10.95
2.	Total under recovery of energy charges during FY 2014-15 (₹ Crore)	B	3.57
3.	Shortfall in generation due to reasons beyond control (MU)	C	6.25
4.	Shortfall in energy charges to be recovered during FY 2016-17 (₹ Crore)	D= C*B/A	**2.04**

41. As mentioned in para 20, Design energy of the generating station for FY 2016-17 shall be assessed as per clause 31 (6) (b) of the 2014 Tariff Regulation. Actual generation during FY 2014-15 is 327.67 MU (A1) and during FY 2015-16 is 345.25 MU (A2). Therefore, (A1+A2–DE) = (327.67 MU + 345.25 MU – 338.61 MU) = 334.31 MU which is less than the Design Energy of the Project i.e. 338.61MU.

42. Accordingly, in terms of Regulation 31(6) (b) of the 2014 Tariff Regulations, we decide that the Design Energy for the FY 2016-17 shall be 334.31 MU till the energy charges shortfall of ₹ 2.04 Crore for the period of FY 2014-15 is recovered by the petitioner by revision of energy bills of FY 2016-17. Further, the difference in energy charges shortfall to be recovered for the FY 2014-15 which may arise after true up of

tariff for the period 2014-19 shall be recovered directly by the generating station from the beneficiaries through supplementary bills after true-up.

43. Petition No. 144/MP/2018 is disposed of in terms of above.

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