CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 139/MP/2016

Coram:
Shri Gireesh B. Pradhan, Chairperson
Shri A.K. Singhal, Member
Shri A.S. Bakshi, Member
Dr. M.K. Iyer, Member

Date of Order: 17th October, 2017

In the matter of

Petition under section 79 (1) of the Electricity Act,2003 read with related provisions of the Chapter-V of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and Regulation 22 (6) (ii) (Chapter-3) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 and Regulation 31 (6) (b) (Chapter-7) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 for allowing recovery of Energy Charge shortfall during the period of 2012-13, 2013-14 and 2014-15 as well as the modification of design energy for 2014-15, 2015-16 and 2016-17 for calculation of ECR till the energy charge shortfall of the previous years has been made up for the Ranganadi Hydro Electric Plant (RHEP), where actual energy generated by the station during a year is less than its approved design energy for reasons beyond the control of the generating company (NEEPCO).

And
In the matter of

North Eastern Electric Power Corporation Limited
Brookland Compound
Lower New Colony
Shillong-793 003
Meghalaya

….Petitioner

Vs

1. Chairman and Managing Director
   Assam Power Distribution Company Ltd.
   "Bijulee Bhawan"
   Paltan Bazar
   Guwahati – 781001
   Assam

2. Chairman and Managing Director
   Meghalaya Power Distribution Corporation Ltd,

Meter Factory, Short Round Road,
Inteegrated Office Complex,
Shillong – 793001
Meghalaya

3. Chairman and Managing Director,
Tripura State Electricity Corporation Ltd
"Bidyut Bhavan" North Banamalipur,
Agartala – 799001
Tripura

4. Engineer in Chief
Power and Electricity Department
Government of Mizoram,
P&E Office Complex,
Electric Veng, Aizawl – 796001
Mizoram

5. The Managing Director
Manipur State Power Distribution Company Ltd.
Khwai bazaar, Keishampet,
Imphal – 795001
Manipur

6. Chief Engineer (Power)
Department of Power,
Government of Arunachal Pradesh,
"Vidyut Bhawan", Itanagar – 791111
Arunachal Pradesh

7. Chief Engineer (Power)
Department of Power, Government of Nagaland
Kohima – 797001
Nagaland

8. Member-Secretary
North Eastern Regional Power Committee
NERPC Complex, Dong Parmaw, Lapalang,
Shillong – 793006
Meghalaya

9. General Manager
North Eastern Regional Load Despatch Centre
Dongtieh, Lower Nongrah, Lapalang,
Shillong – 793006
Meghalaya

10. The Central Electricity Authority
Sewa Bhawan, R.K.Puram,

New Delhi-110066

….Respondents

Following were present:

Shri Paresh Ch. Barman, NEEPCO
Shri Devapriya Chdhdaury. NEEPCO
Ms. Elizabeth Pyrbot, NEEPCO

ORDER

The Petitioner, North Eastern Electric Power Corporation Limited, has filed the present petition to allow recovery of energy charges shortfall in the year 2012-13 and 2013-14 in the tariff period 2009-14 and in the year 2014-15 in the Tariff Period 2014-19 and modification of design energy for the succeeding years for calculation of ECR till the energy charge shortfall of the previous years have been made up for the Ranganadi Hydro Electric Plant.

2. Brief facts of the case leading to the filing of the present petition are as under:

(a) Ranganadi Hydro Electric Plant (3x135 MW) (hereinafter referred to as "generating station") located in Lower Subansiri district in the State of Arunachal Pradesh is owned by the Petitioner. Units I and II of the generating station were commissioned on 12.2.2002 and Unit- III on 12.4.2002.

(b) Central Electricity Authority vide its letter dated 30.1.2004 approved the design energy of the generating station as under:

Month	Design Energy (MUs)
April	125.49
May	120.11
June	122.17
July	247.42
August	224.97
September	156.31
October	111.19
November	81.09
December	88.22
January	79.03

February	68.76
March	84.90
Total	1509.66

(c) The generating station achieved the following actual generation, loss of generation vis-à-vis design energy and Actual Annual plant availability factor during the years 2012-13 to 2015-16:

Financial year	**Actual generation (MU)**	**Loss in generation vis-a-vis D.E. (MU)**	**Actual annual plant availability factor (%)**
2012-13	1239.913	269.7470	95.14
2013-14	980.912	528.748	93.34
2014-15	1109.512	400.1478	86.13
2015-16	1336.798	172.862	96.34

Annual D.E. = 1509.66 MU

(d) The above table shows that, though the actual annual plant availability factor achieved by the generating station in each year is much more than its Normative Annual Plant Availability Factor (NAPAF), which is 85%, actual generation is less than the design energy approved by CEA. The major factor attributable for the less generation is low rainfall, which is beyond the control of the Petitioner. As per the report of India Meteorological Department, there was significantly less rainfall during 2012-13, 2013-14, 2014-15 and 2015-16 in Lower Subansiri District of Arunachal Pradesh.

(e) Regulation 22 (6) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter the 2009 Tariff Regulations) provides for treatment, which shall be applied on a rolling basis, in case the actual total energy generated by a hydro generating station during a year in the tariff period 2009-14 is less than the design energy for reasons beyond the control of the generating company. Similarly, Regulation 31 (6) of the Central Electricity Regulatory Commission (Terms and Conditions of

Tariff) Regulations, 2014 (hereinafter the 2014 Tariff Regulations) provides for treatment, which shall be applied on a rolling basis, in case actual total energy generated by a hydro generating station during a year in the tariff period 2014-19 is less than the design energy for reasons beyond the control of the generating company. However, said regulations do not specify any clear procedure for calculation of modified design energy for a year for calculation of ECR till the energy charge shortfall of the previous year has been made up.

(f) The Petitioner has submitted the year-wise generation loss due to reasons attributable to Petitioner viz. machine outage has been worked out as under:

Financial year	Generation loss due to machine outage (MU)
2012-13	0.097
2013-14	0.000
2014-15	0.392
2015-16	1.797

(g) The Petitioner has worked out the actual year-wise energy generation including losses attributable to Petitioner as under:

(Fig. in MUs)

Sl. NO.	Particulars	2012-13	2013-14	2014-15	2015-16
(1)	Design Energy	**1509.660**	**1509.660**	**1509.660**	1509**.660**
(2)	Actual generation	1239.913	980.912	1109.512	1336.798
(3)	Gross generation loss w.r.t. design energy (1-2)	269.747	528.748	400.148	172.862
	(i) Loss due to machine outage	0.097	0.000	0.392	1.797
	(ii) Loss due to low rainfall	269.650	528.748	399.756	171.065
(4)	Actual Generation including losses at 3(i) attributable to Petitioner [2+3(i)]	1240.01	980.912	1109.904	1338.595

(h) There has been net generation loss (Gross Generation loss–machine outage loss), on account of water non-availability due to low rainfall. The energy charge shortfall as computed by the Petitioner furnished in the petition

submitted vide affidavit dated 12/08/2016 during the respective years in terms of the Regulation 22 (6) (ii) of the 2009 Tariff Regulations and Regulation 31 (6) (b) of the 2014 Tariff Regulations is as under:

Year	Net generation loss due to low rainfall (MU)	Annual Fixed Charge for the year (Rs. in Lakh)	Energy Charge Rate (Rs./kWh)	Energy charge loss (Rs. in Lakh)
2012-13	269.650	30819.36	1.172	1028.40
2013-14	528.748	32126.72	1.221	4158.24
2014-15	399.756	30634.46	1.165	2502.82
Total				**7689.46**

(i) Subsequently, the Commission vide letter dated 16.11.2016 directed Petitioner to submit correct calculation of year-wise Energy charge recovered and co-relate the calculation of energy charge recovered with the energy charge billed by producing the bills of the relevant period in question i.e. 2012-13, 2013-14 and 2014-15. The Petitioner vide affidavit dated 09/12/2016 has revised its computation of energy charge shortfall during 2012-13 to 2014-15 as under:

Year	Net generation loss due to low rainfall (MU)	Annual Fixed Charge for the year (Rs. in lakh)	Energy Charge Rate (Rs./kWh)	Energy charge loss (Rs. in lakh)
2012-13	269.650	30819.36	1.172	2754.04
2013-14	528.748	32126.72	1.221	5082.95
2014-15	399.756	30634.46	1.165	3940.28
Total				**12777.26**

(j) It could be observed that energy charge loss as per revised submission in affidavit dated 9.12.2016 has increased from earlier energy charge loss of Rs. 7689.46 lakh submitted in the Petition No. 139/MP/2016. The increase is due to the fact that in the petition the energy charge recovered was computed on

the basis of ex-bus saleable scheduled energy to beneficiaries which also included 12% free power to home state, whereas in the revised computation of Energy charge loss, energy charge recovered has been computed excluding the free energy of 12% to home state and inclusion of any energy charge recovered thereafter. This we find in order and has been considered.

(k) The Petitioner has submitted the calculated modified design energy for ECR in subsequent year(s) till energy charge loss of previous year(s) has been made up as provided under Regulation 22 (6) (ii) and (iii) of the 2009 Tariff Regulations and Regulation 31(6) (b) and (c) of the 2014 Tariff Regulations as under:

Year	**Generation during the year including the losses attributable to Petitioner**
2012-13	1240.01
2013-14	980.912
2014-15	1109.904
2015-16	1338.595

(l) Modified Design Energy for the years 2014-15, 2015-16 and 2016-17 is calculated by the Petitioner as below:

Financial Year	**Generation during the year including the losses attributable to Petitioner (MU) prior to 2 years**	**Generation during the year including the losses attributable to Petitioner (MU) prior to 1 years**	**Design Energy (MUs)**	**A1+A2-DE**	**Modified Design Energy to be considered for calculation of ECR as per the regulation for the year till the loss has been made up(MUs)**
	(A1)	(A2)	DE		
2014-15	1240.01	980.912	1509.66	675.262	1240.01
2015-16	980.912	1109.904		581.156	980.912
2016-17	1109.904	1338.595		938.839	1109.904

3. Against the above background, the Petitioner has revised its prayer vide affidavit dated 9/12/2016 as against the prayer made in the petition:

> "(a) Consider the instant application and allow the Petitioner to bill & recover the Energy Charge shortfall amounting to Rs. 11777.26 (Rupees Eleven thousand seven hundred seventy seven lakhs and twenty six thousand) for the financial years 2012-13, 2013-14 and 2014-15 for reasons beyond the control of NEEPCO in terms with the Regulation 22 (6) (ii) (Chapter-3) of the Tariff Regulations, 2009 and Regulation 31 (6) (b) (Chapter-7) of the Tariff Regulations, 2014;
>
> (b) Approve the "Modified Design Energy" calculated by the Petitioner for the financial years 2014-15, 2015-16 and 2016-17 for the purpose of calculating Energy Charge Rates till the recovery of energy charge shortfall due to less generation during 2012-13, 2013-14 and 2014-15 respectively for reasons beyond the control of NEEPCO.
>
> (c) Approve the modified ECRs calculated by the Petitioner for the years 2014-15, 2015-16 and 2016-17 till shortfall of previous years is recovered.
>
> (d) Allow to apply similar methodology for recovery of energy charge shortfall for less generation during the financial years 2015-16 due to reasons beyond the control of NEEPCO (generator) by modification of Design Energy for the year 2017-18.
>
> (e) Pass any such further Order or Orders as the Hon'ble Commission may deem just and proper in the circumstances of the case."

4. The Petitioner in the Technical Validation vide letter dated 2.9.2016 was directed to file the following additional information/clarification**:**

(a) Machine outage data as provided at Annexure-IX may be got certified from NERLDC/CEA.

(b) Actual Generation data & Scheduled Energy data as used in the calculations may be got certified from NERLDC.

(c) Petitioner to clarify whether actual generation data is on Ex-bus basis or at generator terminal.

(d) Petitioner to provide the spillage data, if any during the years under consideration.

(e) Inflow series data to be got certified from CWC/CEA.

(f) Status regarding approaching C.E.A for revision of design Energy in view of the fact that generating station is not being able to achieve the design energy since 2009-10.

The Petitioner vide affidavit dated 19.10.2016, has submitted the information as called for in the Technical Validation as above except the inflow series data certified by CWC/CEA which the Petitioner subsequently submitted on 12.08.2017

5. The Petition was admitted on 27.10.2016 and notices were issued to the respondents to file their reply.

6. Further, the following clarification/additional information were sought from the Petitioner through ROP dated 16.11.2016:

(i) The spillage quantity in cumecs for each spillage period provided as per additional submission dated 19.10.2016.

(ii) Correct calculation of year-wise Energy Charge recovered and correlate the calculation of energy charge recovered with the energy charge billed by producing the bills of the relevant period in question i.e. 2012-13, 2013-14 and 2014-15.

7. The Petitioner, vide its affidavit dated 9.12.2016, has submitted the information called for.

8. The Commission vide ROP dated 25.1.2017 for hearing held on 19.1.2017 directed the Petitioner to furnish the following additional information on affidavit, latest by 17.02.2017:

(i) To make efforts in getting certification of actual flow data by CWC or the flow data registered by nearby CWC flow gauges installed at the Upstream of the Project, whichever is available.

(ii) To clarify its stand on submissions of APDCL that the loss of energy generation is due to siltation in the reservoir bed.

(a) Elevation of MDDL.

(b) Elevation of Top and bottom of Intake structure.

(c) Elevation of the top of the Silt level.

(d) How accumulated silt has affected the live capacity of the Reservoir.

(e) A write up to the effect that accumulated silt/reduction in live storage capacity does not have any impact on extent of spillage and possible energy generation.

9. The Petitioner, vide its affidavit dated 17.2.2017, has submitted the information called for.

10. Assam Power Distribution Company Limited (APDCL), vide its reply dated 22.12.2016, has submitted as under:

(a) Originally Design Energy (DE) of RHEP was approved as under:

Month	DE in MU	Month	DE in MU
April	**63**	Oct	174
May	253	Nov	79
June	243	Dec	63
July	301	Jan	49
August	276	Feb	54
Sept	264	March	55
Total Annual Design Energy			1874 MU

(b) Based on request from the Petitioner, the DE of RHEP was reduced by the competent authority to 1509.66 MU just approximately two (2) years after commissioning of the Plant. The reason is best known to the authorities like CEA and the Petitioner and other agencies in this regard. Normally DE of a Hydro Station is finalized after detailed study of rainfall and water availability in and around the catchment area of the project for period of not less than 20-30 years. There are number of Hydro Projects in NER. But no one claims recovery of shortfall of ECR on the basis of lesser rainfall.

(c) Provision as per the relevant Regulation: The Respondent has noted the submission of the Petitioner. As per IEGC scheduling provisions, for such Hydro Stations the Petitioner is supposed to inform NERLDC and all other concerned agencies about the expected Declared Capacity (DC) in terms of MW along with other related information like reservoir water level, water inflow rate etc. for the next day. But the Petitioner never informed about the availability of water in the course of daily scheduling.

(d) The Commission may examine whether due to siltation in the reservoir bed the water bearing capacity of the reservoir is lost resulting into loss of energy generation which is totally attributable to the Petitioner. The Regulation clearly states that the relevant provision 22(6) of the 2009 Tariff Regulations, on

change of ECR would be applicable for reasons beyond the control of the generating station.

(e) The respondent has submitted that because of such daily under generation it has been forced to purchase quantum of shortfall amount from the short term market at a higher tariff and by that way it is already penalized. Now, on the basis of regulatory provision if further burden in the form of shortfall on ECR comes then the Ultimate consumers are going to be inflicted with double punishment.

(f) It is therefore prayed to the Commission to find out any other means of recovery. Since the less rainfall is not attributable to the Respondents and ultimate consumers, the burden should not be borne by the Respondents and ultimate consumers. Reimbursement of shortfall of ECR can be made up from other sources like PSDF.

(g) In operational co-ordination committee (OCC) meeting, the Petitioner takes approval of shutdown of machines for annual maintenance simply on the basis of period of shut down. But details of maintenance works to be carried out are never submitted at the time of shutdown approval and not even after the shutdown is over. The Commission thereafter may call for the details of works carried out during each and every shut down taken, if required with the assistance of NERPC secretariat and NERLDC to ascertain whether steps for periodical removal of silt deposited in the reservoir bed is carried out or not.

11. The Petitioner, vide its rejoinder dated 5.1.2017 to the reply of APDCL, has submitted as under:

(a) The Design Energy of the power station was fixed at 1509.66 MU by the appropriate competent authority more than 10 years back. The Petitioner feels that raising this issue at this is not relevant in the context of the Petition. NEEPCO has claimed shortfall of EC **(**Energy Charge**)** as per provisions of relevant regulations and hence it is not relevant as to whether other project owners make similar claims or not.

(b) The CEA, vide its letter dated 14.02.2017 has stated that Ranganadi HE Project St.-I (405 MW) is a Run of the River scheme with pondage in Arunachal Pradesh. The Project was originally techno-economically cleared by CEA in Dec., 1984 with design energy of the order of 1876 MU in a 90% dependable year. The project was commissioned during the year Feb./Mar. 2001.

(c) At the time of TEC by CEA, inflow data for a period of 16 years from 1956-57 to 1961-62 and from 1972-73 to 1977-78 (collected by CWC at NT Road crossing 59 km. downstream of Ranganadi HE Project St.-I) and at Yazali for the period 1978-82, as collected by NEEPCO, had been utilized for assessment of energy benefits from the project.

(d) Subsequently, design energy from the project was reviewed by CEA as 1509.69 MU taking into consideration the inflow series for 23 years (year 1978-79 to 2000-01) at dam site, developed on the basis of observed data available near Yazali dam site, about 10 km. upstream of Ranganadi Stage-I. The above flow series was recommended by CWC to be considered for design energy review since the same was based on freshly available data

nearer to the dam site as against the earlier series with discontinuous data collected at far off location.

(e) As per available information in CEA, the generation performance of Ranganadi Stage-I for the years 2012-13 to 2015-16 w.r.t. its design energy of about 1510 MU is given below:

Financial Year	Actual Generation	Shortfall in Actual Generation Over design Energy	Forced Outage	Planned Maintenance
	MU	%	%	%
2012-13	1239.94	17.87	2.78	1.23
2013-14	980.94	35.02	4.39	1.36
2014-15	1109.48	26.51	1.79	6.56
2015-16	1280.25	15.20	3.16	0.05

(f) It is seen from the above that the shortfall in annual energy generation from Ranganadi vis-à-vis the design energy ranges from about 15% to 35% even though, the combined planned Maintenance and Forced Outages from the project varies from about 3.2% to 8.3% during the above period.

(g) Contrary to the Respondent's claim there is no provision in IEGC which states that reservoir water level, water inflow rate etc. to be declared along with the DC for the next day. In any case, declaration or otherwise of these data would not have any effect on the actual reality.

(h) APDCL's reference to possibility of generation loss due to siltation in the reservoir bed is not relevant as it ignores the fact that RHEP is a purely Run-of-the-river hydro power station where the generation of electricity is dependent on the real time inflow of water. Further, the relevant authentic meteorological data indicating low rainfall in the catchment area of the RHEP

reservoir during the period in question have been submitted along with the petition in support of the Petitioner's claim.

(i) The Petition has been submitted under provisions of Regulation 22(6) (ii) (Chapter-3) of the 2009 Tariff Regulations and Regulation 31(6) (b) (Chapter-7) of the 2014 Tariff Regulations and hence the prayer of the Respondent to the Commission to find out alternative means is not relevant and out of context.

(j) The loss in generation due to reasons attributable to the Petitioner viz. machine outage has been certified by NERLDC and separately shown in Annexure-IX to the petition. These losses have been excluded from the Petitioner's claim. Further, both NERLDC and NERPC being respondents to this Petition are well aware of the facts and may respond to it if they deem necessary.

(k) Further, contrary to APDCL's contention, the reasons for taking shut down of any unit is informed to all stakeholders through the OCC forum.

(l) The detailed calculations along with authentic supporting data and documents have been already submitted for examination by the Commission.

Analysis and Decision:

12. We have considered the submissions of the Petitioner and the respondents and perused documents on record. The Petitioner has filed the present petition to allow it to bill and recover the energy charge shortfall for the financial years 2012-13 and 2013-14 in terms of Regulation 22 (6) of the 2009 Tariff Regulations and for the

year 2014-15 in terms of Regulation 31 (6) (b) of the 2014 Tariff Regulations and approve the modified design energy calculated by NEEPCO for the purpose of calculating energy charge rates till the recovery of energy charge shortfall due to less generation during 2012-13 to 2014-15.

13. There was energy charge shortfall in the year 2009-10, 2010-11 and 2011-12 also during 2009-14 period and the same was allowed to be recovered by the Commission in the order dated 8.3.2016 in Petition No. 13/MP/2014 in accordance with Regulation 22 (b) of 2009 Tariff Regulations. Since there is energy shortfall for the period 2012-13 and 2013-14, the same shall be considered in terms of Regulation 22 (b) of 2009 Tariff Regulations.

14. In the Tariff Regulations, 2014, which is applicable from 1.4.2014, there is a provision that in case actual generation from a hydro generating station is less than the design energy for a continuous period of 4 years on account of Hydrology factor, the generating station shall approach CEA with hydrology data for revision of design energy of the station. Since energy shortfall is for more than 4 consecutive years before 1.4.2014, the Petitioner is required to revise the design energy by approaching CEA alongwith the date of actual generation for preceding 4 years i.e. 2010-11 to 2013-14. Therefore, energy charge shortfall in the year 2014-15 cannot be considered till the design energy is revised by CEA. The Petitioner is directed to approach CEA with all the hydrology data for revision of design energy for the year 2014-15 onwards.

15. The issue now for our consideration is whether the low generation in the year 2012-13 and 2013-14 were attributable to the factors beyond the control of the

Petitioner, namely lower inflows in comparison to design year, stoppage of plant due to law and order problems, force majeure, etc.

16. Regulation 22 (6) of the 2009 Tariff Regulations provides as under:

> "22 (6) (i). in case the energy shortfall occurs within ten years from the date of commercial operation of a generating station, the Energy charge rate (ECR) for the year following the year of energy shortfall shall be computed based on the formula specified in clause (5) with the modification that the Design Energy for the year shall be considered as equal to the actual energy generated during the year of the shortfall, till the energy charge shortfall of the previous year has been made up, after which normal ECR shall be applicable;
>
> (ii)In case the energy shortfall occurs after ten years from the date of commercial operation of a generating station, the following shall apply:
>
> 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 this Regulation for calculation 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.
>
> (iii) Actual energy generated (e.g. A1, A2) shall be arrived at by multiplying the net metered energy sent out from the station by 100/ (100-AUX)."

17. In the present case, the energy shortfall in the year 2012-13 and 2013-14 is after ten years of COD since the Ranganadi HEP was commissioned in year 2001. Accordingly, under Provision (ii) of Regulation 22(6) of the Tariff Regulations, 2009 the recovery of energy charge shortfall in the year 2012-13 and 2013-14 would be made in the year 2014-15 and 2015-16 respectively i.e. in the tariff period 2014-19. Irrespective of the fact that the recovery would be made in tariff period 2014-19. since the shortfall has occurred in 2009-14 tariff period, the shortfall in the year 2012-13 and 2013-14 are to be considered as per Tariff Regulations, 2009.Thus, as per the above provisions, in case the energy shortfall is not on account of controllable factors attributable to the Petitioner, Provisions of Regulation 22(6) (ii) of the 2009 Tariff Regulations would apply for respective periods.

18. APDCL has contended that the Design Energy of RHEP was reduced by the competent authority to 1509.66 MU as against 1874 MU just approximately two (2) years after commissioning of the Plant. However, it is seen that, the design energy for the project was reviewed by CEA as 1509.69 MU taking into consideration the inflow series for 23 years (year 1978-79 to 2000-01) at dam site, developed on the basis of observed data available near Yazali dam site, about 10 km upstream of Ranganadi Stage-1.The above flow series was recommended by CWC to be considered for design energy review since the same was based on freshly available data nearer to the dam site as against the earlier series with discontinuous data collected at far off location. Therefore, this issue raised by the APDCL is not tenable.

19. APDCL has contended that the Commission may examine whether due to siltation in the reservoir bed the water bearing capacity of the reservoir is lost resulting in loss of energy generation as energy loss due to siltation is totally attributable to the Petitioner. As per submission of Petitioner vide affidavit dated 17.02.2017 and 12.05.2017 with regard to information sought by Commission in the RoP of hearing dated 19.01.2017, the invert level of Tunnel Intake is 547.90 M and Overt level of Tunnel Intake is 554.667 M. The difference between the Intake & overt level of Tunnel Intake is 6.77 M. The elevation of top of silt level in reservoir is 546.00 M and elevation of bottom of silt level in the reservoir is 544.0 M. The difference between the top and bottom level of silt level in reservoir is 2.00 M. The invert level of tunnel intake is 547.90 M, which is 1.90 M above the Elevation of top of the silt level in the reservoir is 546.00 M. The crest level of the Dam is 544.00 M, which is below the MDDL of 560.00 M. Further, the opening of the gates is through the bottom, i.e., at the crest. Presumably, there is no effect of silt on the live storage

capacity of the reservoir and accordingly we are of the view that there is no possibility of generation loss due to siltation in the reservoir bed. Therefore, the issue of generation loss due to siltation raised by APDCL does not appear to be correct.

20. APDCL has argued that the Commission may compensate the generator for generation loss from sources like PSDF instead of booking the same in the tariff, since the less rainfall is not attributable to the Respondents and ultimate consumers. The Commission has provided in the 2009 Tariff Regulations to compensate generator for any generation loss not attributable to the generator. In view of this any such relief has to be granted in the tariff as per the laid down procedure in the regulations. Therefore, we cannot accept the proposal of APDCL.

21. APDCL has contended that as per IEGC scheduling provisions, for such Hydro Stations the Petitioner is supposed to inform NERLDC and all other concerned agencies about the expected Declared Capacity (DC) in terms of MW along with other related information like reservoir water level, water inflow rates etc. for the next day. But it is alleged that the Petitioner never informed about the availability of water in the course of daily scheduling. Declared capacity (D.C.) and scheduling etc. is being done on day ahead basis and in a run of river projects with small pondage where water level in the reservoir is dependent on real time flow in the river, the information w.r.t. reservoir level; inflow rates cannot be declared on day ahead basis. Further, as per letter of CEA dated 14.02.2017, Ranganadi HE Project St.-1 (405 MW) is a Run of the River scheme with Pondage where the generation of electricity is dependent on the real time inflow of water. The RHEP Dam is a diversion Dam and it is constructed only to divert the water of river Ranganadi

through the tunnel and the power house down to river Dikrong. Therefore, the issue raised by the APDCL is devoid of merit and accordingly not considered.

22. CWC vide letter dated 19.7.2017 has certified that the inflow series data for the period 2012-13, 2013-14 and 2014-15 as submitted by the Petitioner is in order and concluded that the reduced inflow at Ranganadi HEP is due to decrease in rainfall in Catchment area. Further, CEA has also supported the actual generation data based on the performance data.

23. The Petitioner was directed to submit the "Machine outage as certified" and "Actual Generation data and Scheduled Energy data as used in the calculation Generation loss due to machines outages" vetted by NERLDC to ensure that the lower generation was not due to prolonged machine outages during the years 2012-13 and 2013-14. The Petitioner vide its affidavit dated 19.10.2016 has placed on record the information called for. NERLDC, Shillong has verified Actual Generation data and Scheduled Energy data and the machine outage data submitted by the Petitioner. Perusal of the data submitted by the Petitioner and NERLDC reveals that apart from "generation loss due to machine outages", the major reason for lower generation during the period 2012-13 and 2013-14, was lower inflows which cannot be attributed to the Petitioner. The Petitioner, while arriving at the extent of loss suffered by way of non-recovery of energy charges, has already factored in the "generation loss due to machine outages" under the head generation loss attributable to the Petitioner. In view of the above, the Petitioner's case for shortfall appears to be justified. Accordingly, under-recovery in energy charge shortfall in the years 2012-13 and 2013-14 to be recovered are calculated as under:

Design Energy (MUs) (a)	1509.69		(Total)
Normative Auxiliary Consumption (b)	1%		
Ex-bus design energy considering normative auxiliary energy consumption (MUs) (c) = (a)*{100%-(b)}	1494.593		
Free Energy to Home State (MUs) (d)	12%		
Ex-bus saleable design energy (MUs) (e) = (c) *{100% - (d)}	1315.242		
	2012-13	**2013-14**	
Saleable scheduled energy (MUs) as per affidavit dated 09.12.2016 (f)	1079.748	801.240	
Actual generation as per petition and verified from Annual reports (MUs) (g)	1239.913	980.912	
AFC for 2012-13 and 2013-14 as per order dated 28.09.2015 in petition no. 457/GT/2014 and for 2014-15 as per order dated 7/3/2016 in petition no. 40/GT/2015 (Rs. in lakh) (h)	30819.36	32126.72	
Maximum Energy Charge recoverable (Rs. in lakh) (i) = (h)/2	15409.68	16063.36	**31473.04**
Energy Charge Rate (Rs./kWh) (j) = (i)/(e)	1.172	1.221	
Energy Charge recovered as per petition (Rs. in lakh) (k)	12654.64	10980.41	**23635.04**
Shortfall in energy charges (Rs. in lakh) (l) = (i) – (k)	2755.04	5082.95	**7837.99**
Shortfall in ex-bus energy attributable to Petitioner (MUs) (m)	0.097	0.00	**0.097**
Shortfall in ex-bus saleable energy attributable to Petitioner (MUs) (n) = m * (100% -12%)	0.085	0.00	**0.085**
Shortfall in money terms attributable to Petitioner (Rs. in lakh) (o) = (j)*(n)* 10	0.9962	0.00	**0.9962**
Recoverable due to less inflow (Rs. in lakh) (p) = (l) – (o)	2754.04	5082.95	**7836.99**

24. Modified Design energy for calculation of ECR in subsequent year(s) till energy charge loss of the previous year (s) have been made up is re-calculated as under:

(a) Actual Ex-bus Generation during 2012-13 and 2013-14:

Year	**Actual Generation (MU) (A)**	**Loss due to reasons attributable to Petitioner viz. machine outage (MU) (B)**	**Actual Generation during the year including the losses attributable to Petitioner (MU) (C) = (A+B)**
2012-13	1239.913	0.097	1240.01
2013-14	980.912	0.000	980.912

(b) Modified Design Energy for the years 2014-15 and 2015-16:

Financial Year	Actual Generation Including the losses attributable to Petitioner for the year,2 years prior to the current year (MU)	Actual Generation including the losses attributable to Petitioner for the year, one year prior to current year (MU)	Design Energy (MUs)	A1+A2-DE	Modified Design Energy to be considered for calculation of ECR as per the regulation for the year till the loss has been made up (MUs)
	(A1)	(A2)	DE	(B)	(C)
2014-15	1240.01	980.912	1509.66	711.232	1240.01
2015-16	980.912	1109.908		581.126	980.912

25. Having considered that lower generation during the years 2012-13 and 2013-14 is not attributable to the Petitioner, we allow the modified design energy for the years 2014-15 and 2015-16 as indicated in column (C) of the above table for the calculation of Energy Charge Rates (ECR) for the years following the years of energy shortfall, based on the formula specified in Regulation 22 (6) (ii) of the 2009 Tariff Regulations, with the modification that the Design Energy for the year shall be considered as equal to the actual energy generated during the year of the shortfall, till the energy charge shortfall of the previous years has been made up, after which normal ECR shall be applicable. Accordingly, the following modified ECRs for the years 2014-15 and 2015-16 shall be applicable till the energy charge shortfall of 2012-13 and 2013-14 is recovered:

Year	Modified Design Energy for the calculation of till the previous year loss is made up (MU)	AFC for the year 2014-15, 2015-16 and 2016-17 respectively subject to truing up as per order dated 7.3.2016 in petition no. 40/GT/2014 (Rs. in lakh)	50% of AFC for the year 2014-15, 2015-16 and 2016-17 respectively (Rs. in lakh)	Modified ECR till previous year shortfall is recovered (Rs./kWh)
	(A)	(B)	(C)	D=C/(A*10*0.99*0.88)
2014-15	1240.01	30634.46	15317.23	1.418
2015-16	980.912	25491.21	12745.61	1.491

26. Based on the modified ECRs allowed vide order dated 08.03.2016 in Petition No. 13/MP/2017 for the years 2010-11, 2011-12 and 2012-13 for recovery of shortfall in Energy charges for the years 2009-10, 2010-11 and 2011-12, the actual shortfall at the end of 2012-13 provided by the Petitioner has completely modified the bills for the period 2010-11 to 2012-13 which works out to Rs. 1515.87 lakh. Further, based on the modified ECRs for the year 2014-15 and 2015-16 allowed in the instant petition, the unrecovered energy charge of year 2013-14, works out to Rs. 567.73 lakh at the end of 2015-16. The necessary calculations in this regard are as follows:

				D.E.	1509.69		**Rs. In Lakh**
				Saleable DE	1315.24		
	2009-10	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
AFC (Rs. in Lakhs)	30737.48	30806.61	30501	30819.36	32126.7	30634.46	25491.21
Half of AFC (Rs. in Lakh)	15368.74	15403.31	15250.50	15409.68	16063.40	15317.23	12745.23
Shortfall in Money terms attributable to Petitioner (Rs. in Lakh)		473.44	47.84	1.00	0.00	4.02	15.32
Diff. b/w Half of AFC & Shortfall attributable to Petitioner (Rs. in Lakh)		14929.87	15202.66	15408.684	16063.4	15313.21	12730.28
ECR (normal)	1.169	1.171	1.160	1.172	1.221	1.165	0.969
Annual Loss based on normal ECR after accounting for loss attributable for loss attributable to Petitioner	4788.19	503.96	5310.52	2754.04	5082.95	3940.28**	0
Saleable Scheduled Energy	896.87	1231.84	853.59	1079.75	801.24	960.88	1156.64

ECR modified allowed in previous order dated 08.03.2016/being allowed in the instant order		1.692	1.192	1.778		1.418	1.491
Energy charges to be recovered including previous short fall		19718.06	15206.66	20713.79		16829.08	17813.23
Recovered during the year		20842.77*	9897.55	19197.92		13625.34	17245.50
Loss at the end on of year based on modified ECR	4788.19	0	5305.11	1515.87	5082.95	3203.75	567.73@
Shortfall Recovered	-	5292.15	5.410	6543.28		2252.4	4515.22
Total Loss with Normal ECR	4788.19+503.96+5310.52+2754.04+5082.95 = 18439.66						
Total Re-covered	4788.19+503.96+5.410+6543.28+2252.40+4515.22 = 18608.46						
Reconciliation	18608.46-736.53+567.73 = 18439.66						

* Recovery to be restricted to Rs. 19718.06 Lakh.

** Recovery of shortfall of Rs. 3940.28 lakh in the year 2014-15 is not being allowed. However, out of this amount of Rs. 3940.28 lakh, Rs.736.53 lakh will get recovered due to modification of ECR for the year 2014-15. Accordingly, the Petitioner is directed to stop billing of energy charge by modified ECR during 2014-15 once the shortfall of the year 2012-13 is recovered so that the shortfall for the year 2014-15 remains at Rs. 3940.28 lakh.

@ Further, to complete the recovery of energy charge shortfall for the year 2013-14, the modified energy charge rate of Rs.1.491/unit for the year 2015-16 shall be further adjusted to Rs. 1.540/unit so as to recover balance amount of Rs. 567.73 lakh pertaining to year 2013-14 being recovered in the year 2015-16.

Shortfall in energy charge as allowed in the year 2012-13 and 2013-14 to be recovered in 2014-15 and 2015-2016 is subject to adjustment based on the design energy as revised by CEA.

27. The Petitioner is directed to approach CEA for revision of Design Energy for the year 2014-15 onwards.

28. The petition is disposed of in terms of the above.

sd/-	**sd/-**	**sd/-**	**sd/-**
(Dr. M. K. Iyer)	**(A. S. Bakshi)**	**(A. K. Singhal)**	**(Gireesh B. Pradhan)**
Member	**Member**	**Member**	**Chairperson**