CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 43/GT/2015

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

DATE OF HEARING: 16.7.2015
DATE OF ORDER: 13.01.2016

IN THE MATTER OF

Approval of tariff of Doyang Hydro Electric Power plant (75 MW) of North Eastern Electric Power Corporation Limited (NEEPCO) Shillong for the period from 1.4.2014 to 31.3.2019.

AND

IN THE MATTER OF

North Eastern Electric Power Corporation Ltd
Brookland Compound
Lower New Colony
Shillong-793 003 **……..Petitioner**

Vs

1. Assam Power Distribution Company Ltd.
"Bijulee Bhawan", Paltanbazar
Guwahati-781 001

2. Meghalaya Energy Corporation Ltd.
Meter Factory Area, Short Round Road
Integrated Office Complex
Shillong-793 001

3. Tripura State Electricity Corporation Ltd.
Bidyut Bhavan, North Banamalipur
Agartala-799 001

4. Power and Electricity Department
Govt. of Mizoram
P&E Office Complex, Electric Veng,
Aizwal-796 001

5. Manipur State Power Distribution Co. Ltd.,
Electrical Complex, Khawai Bazar,
Keishampat, Imphal-795 001

6. Department of Power
Govt. of Arunachal Pradesh
Vidyut Bhawan
Itanagar-791 111

7. Department of Power
Govt. of Nagaland
Kohima-797 001

8. North Eastern Regional Power Committee
NERPC Complex, Dong Parmaw
Lapalang , Shillong-793 003

9. North Eastern Regional Load Despatch Centre
Dongtieh, Lower Nongrah
Lapalang, Shillong-793 006 **...Respondents**

Parties present:

Shri Rana Bose, NEEPCO
Shri Paresh Ch. Barman, NEEPCO
Shri Devapriya Choudhary, NEEPCO
Ms. Elizabeth Pyrbot, NEEPCO
Shri K. Goswami, APDCL

ORDER

This petition has filed by petitioner, North Eastern Electric Power Corporation Ltd (NEEPCO), for approval of tariff of Doyang Hydro Electric Project (3 x 25MW) (hereinafter referred to as "the generating station") for the period 2014-19 in terms of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 ("the 2014 Tariff Regulations").

2. The project comprises of three units of 25 MW capacity each and is a run of the river scheme with pondage having a Head Race Tunnel and a surface Power House. With a corresponding reservoir. The date of commercial operation of the units, corresponding to its capacity is as under:

	Date of commercial operation (COD)
Unit-I	29.6.2000
Unit-II	5.7.2000
Unit-III /Generating station	8.7.2000

3. The tariff of the generating station for the 2009-14 was determined by the Commission in order dated 28.9.2015 in Petition No. 458/GT/2014. The annual fixed charges approved by the Commission vide order dated 28.9.2015 is as under:

(₹ in lakh)

	2009-10	2010-11	2011-12	2012-13	2013-14
Return on Equity	1965.40	2446.78	2867.51	3275.51	3707.18
Interest on Loan	23.74	0.00	0.00	0.00	0.00
Depreciation	3719.35	3719.81	3721.52	3726.69	1005.88
Interest on Working Capital	244.51	261.24	277.64	294.28	255.05
O & M Expenses	2509.67	2653.22	2804.98	2965.42	3135.04
Total	**8462.68**	**9081.04**	**9671.65**	**10261.90**	**8103.15**

4. The petitioner vide affidavit dated 15.12.2014 has prayed for the determination of tariff of the generating station for the period 2014-19 in accordance with the 2014 Tariff Regulations. Accordingly, the annual fixed charges claimed by the petitioner for the period 2014-19 are as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Return on Equity	6952.35	8032.14	8514.57	8551.51	8562.57
Interest on Loan	0.00	10.82	10.82	0.00	0.00
Depreciation	1003.92	1037.85	1122.21	1156.16	1171.51
Interest on Working Capital	398.59	438.79	467.10	484.76	502.73
O & M Expenses	3900.10	4159.22	4435.56	4730.26	5044.54
Total	**12254.96**	**13678.82**	**14550.26**	**14922.69**	**15281.35**

5. Reply to the petition has been filed by the respondent No.1, APDCL. The petition was heard on 7.4.2015 and the Commission vide Record of the proceedings held on 7.4.2015 directed the petitioner to file certain additional information. In response, the petitioner vide affidavit dated 1.6.2015 has filed the information with copy to the respondents. Thereafter, the matter was heard on 16.7.2015 and the Commission after directing the petitioner to file certain additional information, reserved its orders in the petition.

6. Based on the submissions of the parties and the documents available on record and on prudence check, we proceed to determine the tariff of the generating station for the period 2014-19 as stated in the subsequent paragraphs.

Capital Cost

7. Clause (1) of Regulation 9 of the 2014 Tariff Regulations provides that the capital cost as determined by the Commission after prudence check in accordance with this regulation shall form the basis of determination of tariff for existing and new projects. Clause (3) of Regulation 9 provides as under:

"9(3) The Capital cost of an existing project shall include the following: (a)the capital cost admitted by the Commission prior to 1.4.2014 duly trued up by excluding liability, if any, as on 1.4.2014;

(b)xxxx

(c) xxxx

8. The Commission in its order dated 28.9.2015 in Petition No.458/GT2014 had approved the closing capital cost of ₹63806.14 lakh as on 31.3.2014. This has been considered as the opening capital cost as on 1.4.2014 for the purpose of determination of tariff of the generating station for the period 2014-19.

Additional Capital Expenditure for 2014-19

9. Clause (3) of Regulation 7 of the 2014 Tariff Regulations provides that the application for determination of tariff shall be based on admitted capital cost including any additional capital expenditure already admitted upto 31.3.2014 (either based on actual or projected additional capital expenditure) and estimated additional capital expenditure for the respective years of the tariff period 2014-15 to 2018-19. Clause 3 of Regulation 14 of the 2014 Tariff Regulations, provides as under:

"14.(3) The capital expenditure, in respect of existing generating station or the transmission system including communication system, incurred or projected to be incurred on the following counts after the cut-off date, may be admitted by the Commission, subject to prudence check:
(i) Liabilities to meet award of arbitration or for compliance of the order or decree of a court of law;

(ii) Change in law or compliance of any existing law;

(iii) Any expenses to be incurred on account of need for higher security and safety of the plant as advised or directed by appropriate Government Agencies of statutory authorities responsible for national security/internal security;

(iv) Deferred works relating to ash pond or ash handling system in the original scope of work;

(v) Any liability for works executed prior to the cut-off date, after prudence check of the details of such un-discharged liability, total estimated cost of package, reasons for such withholding of payment and release of such payments etc.;

(vi) Any liability for works admitted by the Commission after the cut-off date to the extent of discharge of such liabilities by actual payments;

(vii) Any additional capital expenditure which has become necessary for efficient operation of generating station other than coal / lignite based stations or transmission system as the case may be. The claim shall be substantiated with the technical justification duly supported by the documentary evidence like test results carried out by an independent agency in case of deterioration of assets, report of an independent agency in case of damage caused by natural calamities, obsolescence of technology, up-gradation of capacity for the technical reason such as increase in fault level;

(viii)In case of hydro generating stations, any expenditure which has become necessary on account of damage caused by natural calamities (but not due to flooding of power house attributable to the negligence of the generating company) and due to geological reasons after adjusting the proceeds from any insurance scheme, and expenditure incurred due to any additional work which has become necessary for successful and efficient plant operation;

(ix) In case of transmission system, any additional expenditure on items such as relays, control and instrumentation, computer system, power line carrier communication, DC batteries, replacement due to obsolesce of technology, replacement of switchyard equipment due to increase of fault level, tower strengthening, communication equipment, emergency restoration system, insulators cleaning infrastructure, replacement of porcelain insulator with polymer insulators, replacement of damaged equipment not covered by insurance and any other expenditure which has become necessary for successful and efficient operation of transmission system; and

(x) Any capital expenditure found justified after prudence check necessitated on account of modifications required or done in fuel receiving system arising due to non-materialization of coal supply corresponding to full coal linkage in respect of thermal generating station as result of circumstances not within the control of the generating station:

Provided that any expenditure on acquiring the minor items or the assets including tools and tackles, furniture, air-conditioners, voltage stabilizers, refrigerators, coolers, computers, fans, washing machines, heat convectors, mattresses, carpets etc. brought after the cut-off date shall not be considered for additional capitalization for determination of tariff w.e.f. 1.4.2014:

Provided further that any capital expenditure other than that of the nature specified above in (i) to (iv) in case of coal/lignite based station shall be met out of compensation allowance:

Provided also that if any expenditure has been claimed under Renovation and Modernisation (R&M), repairs and maintenance under (O&M) expenses and Compensation Allowance, same expenditure cannot be claimed under this regulation."

10. The year-wise breakup of the actual/ projected additional capital expenditure claimed by the petitioner is as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Additional Capital Expenditure claimed on gross basis	765.00	2022.00	700.00	320.00	0.00	**3807.00**
De-capitalization claimed	0.00	213.88	10.00	25.00	0.00	**248.88**
Net Additional Capital Expenditure claimed	**765.00**	**1808.12**	**690.00**	**295.00**	**0.00**	**3558.12**

11. Based on the submissions of the parties and the documents available on record, the claims of the petitioner for the period 2014-19 are considered and allowed on prudence check, as detailed in the subsequent paragraphs.

2014-15

(₹ in lakh)

Sl. No.	Assets/ Works	Amount claimed	Justification submitted by the petitioner	Remarks on admissibility	Amount Allowed
1	Construction of additional quarters as per entitlement	650.00	CISF was inducted in the generating station during April'1994 on urgent basis for security reasons without creating any infrastructure for their accommodation. They were allotted the quarters constructed for officials of the petitioner corporation and were accommodated in temporary quarters which are now beyond repairs as their life span is over. At present the employee strength of the generating station is 333 Nos. while only 248 permanent quarters are available. Out of these, 60 Nos. have been allotted to CISF, KV School, etc. Therefore	**Allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations as the work was already allowed during 2009-14 vide order dated 24.12.2012 in Petition No. 63/2010.	**650.00**

			additional quarter felt too necessary for the project employees & others for operation of the plant. Further, there was delay in finalization of site selection, preparation of Design & drawings and finalization of tenders. These were all accountable to the facts of lack of proper infrastructure/road communication facilities, remoteness of the location and above all prevailing un-conductive law & order scenario.		
2	Boundary wall of the colony	40.00	The permanent colony is presently devoid of any fencing which is required for protection of the employees. Hence, a chain link fence is proposed to be constructed for this purpose. Further the main reason of delay in taking up the work is due to the prevailing unconducive situation in the project area. However, decision regarding the work could be taken up during the last part of 2013-14 and final bills are too paid during current financial year.	**Allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations as the work was already allowed during 2009-14 vide order dated 24.12.2012 in Petition No. 63/2010.	**40.00**
3	Parapet wall at Dam Top	15.00	This was to be taken up after completion of the works of the Rock-fill dam of DHEP and before commissioning of the Plant. A parapet wall already exists on the upstream side of the Dam Top but not on the Downstream side. Due to certain reasons and the then prevailing unconducive law and order scenario this could not be taken up. However, keeping in mind the safety of human life, it is found necessary that a parapet wall on the downstream side of the Dam Top needs	**Allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the work is considered necessary for safety of the employees working at site and in turn will facilitate the efficient and successful operation of the plant.	**15.00**

			to be constructed.		
4	Measuring Instruments and diagnostic tools	60.00	For accurate analysis, better monitoring and preventive maintenance of the powerhouse it is felt necessary that certain measuring instruments and diagnostic tools viz., Tan-Delta Test Kit, DCRM, etc. needs to be procured. These items are also listed in the DPR against the Protection Audit carried out for DHEP by CPRI. As of now, carrying out these Tests through outside agencies are cumbersome and due to remoteness of DHEP several competent agencies are not even willing to attend to our requests. Hence, procurement of this Kits/Instruments at DHEP will be very helpful in smooth functioning of Doyang Power Station.	**Not allowed,** since the assets are of the nature of tools and tackles.	**0.00**
Total amount claimed		**765.00**		**Amount allowed**	**705.00**

2015-16

(₹in lakh)

Sl. No.	Assets/ Works	Amount claimed	Justification submitted by the petitioner	Remarks on admissibility	Amount Allowed
1	Construction of additional quarters as per entitlement	500.00	Detail justification elaborated & referred during the year 2014-15 vide sl no.1	**Allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations as the work was already allowed during 2009-14 vide order dated 24.12.2012 in petition no. 63/2010.	**500.00**
2	Installation of permanent water source for the use of the colonies and Installation of water purification scheme.	400.00	There is no permanent water supply for the generating station. This requirement needs to be addressed and the expenditure is made on capital account. Presently, the water supply is tapped from a reservoir from un-acquired land. There are constant threats from the landowners for disruption of the supply, if their demands for contracts are not met. Moreover, quality of the		**400.00**

			water tends to fall during heavy rains due to high turbidity and silt content. The work for the water supply scheme includes drilling of 4 nos. of 200 mtr 4' inch drill holes, pumps, main storage tank, 2 nos. distribution tanks etc. The water purification scheme required for the above water supply scheme includes construction of sedimentation and treatment tanks. The Department of Geology & Mining, Govt. of Nagaland was roped in for drilling of Bore wells as a source of permanent water supply. However, the attempt turned to be futile as the topography and the underneath structure of rocks did not permit to locate a suitable underground water source. As per their suggestion too it would have been of no use if they would have drilled any deeper or at any other location in the project area. Therefore, now it is planned that water from the reservoir or any other suitable source near by shall be treated and used for the potable water supply scheme and accordingly survey and investigation has already been taken up in 2014-19		
3	Survey of the Doyang River Downstream for Dam Break Analysis	42.00	This was to be taken up after completion of the works of the Rock-fill dam of DHEP and before commissioning of the Plant. Due to certain reasons and then prevailing unconducive law and order scenario this could not be taken up. So now it is found essential to carry out the Survey of the Doyang River Downstream till Assam border for the Dam Break Analysis. Further, this is as per the guidelines of the CWC.	**Allowed under** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the work will ensure the safety of Dam and in turn will facilitate the efficient and successful operation of the plant.	**42.00**
4	Colony Roads including side drains, culverts, retaining walls, etc	75.00	The Project is linked by 12.41 km of internal roads which are in deplorable condition. This needs urgent expenditure to maintain effortless connectivity and upgrade the aesthetics of	**Not allowed,** as maintenance of roads including side drains, culverts etc. Is of revenue expenditure.	**0.00**

			the project. The main reason of delay in taking up the work is due to the prevailing unconducive situation in the project area. Work will be taken up in 2014-19.		
5	Tail Race Channel Excavation	400.00	Due to landslide the river bed level has increased and affected tail water level of the tail pool area. It is found that there is a loss in Head and Turbine Output. This loss is seen to be almost proportionate to all consequent RWL. All these losses are because of the constricted flow of water and the high bed level of the Tail Race Channel. Therefore, to improve the machine efficiency and to nullify the head loss necessary excavation of the Tail Race Channel needs to be carried out so that optimum generation can be achieved at even lower water levels.	**Not allowed.** The generating station has been assigned with normative design energy based on the design year flows. If the petitioner is able to generate more than the design energy at even lower water levels by way of tail race excavation, then the petitioner would earn extra incentive @ 90 paise per unit. Petitioner may like to take a call based on cost benefit analysis of increase in generation due to tail race excavation. As such, all expenditure which can increase the generation beyond design energy shall be met from the secondary energy benefits i.e. 90 paise/unit.	**0.00**
6	Upgradation of Electro-mechanical relays to numerical relays & EM energy meters to ABT Compliant digital meters.	250.00	The present protection system of Generators, Generator Transformers, UATs, 132KV & 33KV Feeders, Bus-Coupler, Bus-Bar and Station Transformer mainly consists of electro-mechanical relays and was supplied during the commissioning of the Plant by M/s ABB Ltd. Now, the existing system is obsolete and spares of the same are not readily	Upgradation of this asset is **allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the asset will facilitate successful and efficient operation of plant.	**250.00**

			available. Numerical relays are in line with standardization of protection schemes for generation stations. Further in comparison to electromechanical relay, Numerical protection devices offer several advantages in terms of protection, reliability, troubleshooting and fault information. Along with the said relays EM Energy meters needs to be upgraded to ABT Compliant digital meters for accurate and reliable readings.		
7	Replacement of Co2 fire fighting system of 3 Nos. Generators	50.00	Control panel and gas piping systems, sensors needs to be overhauled/revamped. This renovation shall help in effective safety of the Hydro Generators mainly in case of any eventuality	Replacement of this asset is **allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the asset will facilitate successful and efficient operation of plant.	**50.00**
8	Replacement of 220v, 600AH, 2V/cell battery bank	90.00	Due to prolonged usage i.e., for over 15 years, of the existing 110 nos. (2V each), 220V, 600AH Battery Bank, it is felt necessary that the same needs to be replaced by procuring a new set. The Battery Bank supplies 220V DC to all the Local & Remote Controls and Relays of the Doyang Power Station and Switchyard Panels and, in turn, failure of this Battery Bank would jeopardize the running of the Power Station. The existing battery bank has completed its service life and hence replacement is necessary.	Replacement of this asset is **allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the asset will facilitate successful and efficient operation of plant.	**90.00**
9	Replacement of 5 MVA, 132/33Kv Station service transformer.	50.00	The 5 MVA, 132/33 kV, CGL Make Station Transformer was commissioned in the year 1999. However, due to recurring problems the same was taken out of service and instead a 2.5 MVA, 132/33 kV Areva Make transformer has been put into service in Jan'2011. After inspection of the Core Coil Assembly of the 5MVA Transformer it was found that	Replacement of this asset is **allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the asset will facilitate successful and efficient operation of plant.	**50.00**

			copper granules were scattered in the tank and burnt out marks were also visible in the top disc of the Y-Phase. The service engineer from M/s CGL due to recurring problems history of the said transformer recommended for replacement of all 3 nos. (both HV & LV) coils for restoration of the transformer. When the 5 MVA, 132/33 kV Station Transformer gets repaired the same shall be kept in charge and cater to the need of DHEP.		
10	Installation of online vibration monitor	75.00	For online condition monitoring of the units. Statutory requirement as advised by Regional Inspector Office, CEA, Shillong. This is completely new one which is required to be procured based on the recommendation by CEA.	**Allowed under** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the asset will facilitate successful and efficient operation of plant.	**75.00**
11	Up-gradation of Air conditioning Systems	50.00	The present 7.5 Ton Carrier Make Air Conditioning System at Doyang Power Station has been in use since commissioning of the Plant. As of now, its cooling power has reduced and is under frequent breakdown. This at times may hamper the functioning of the sophisticated control & protection equipment of the Power Station which require a comparative low ambient temperature. It is to be noted that after the upgradation to numerical protection scheme proper maintenance of low ambient temperature would be of paramount importance. Further, the new Air Conditioning System to be procured shall be much Energy Efficient compared to the present one.	**Not allowed,** since the asset is of minor nature.	**0.00**
12	Procurement Fire Tender 4500 lts.	40.00	A new Fire Tender (Water) of capacity 4500 Ltrs may be procured as the existing Fire Tender (Water) with capacity 500 Ltrs is inadequate to meet the emergency situations.	Replacement of this asset is **allowed** under Regulation 14(3)(viii) of the 2014 Tariff	**40.00**

			Moreover, the existing Fire Tender (Water) with capacity 500 Ltrs was purchased in 1995 and at present its spares are not readily available in the market. Further, it has other mechanical problems related to the suction and discharge of the pumps and its body condition has also deteriorated.	Regulations, as the asset will facilitate successful and efficient operation of plant.	
Total amount claimed		**2022.00**		**Amount allowed**	**1497.00**

2016-17

(₹ in lakh)

Sl. No.	Assets/ Works	Amount claimed	Justification submitted by the petitioner	Remarks on admissibility	Amount Allowed
1	Construction of additional quarters as per entitlement	250.00	Detail justification elaborated & referred during the year 2014-15 vide sl no.1	**Allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations as the work was already allowed during 2009-14 vide order dated 24.12.2012 in Petition No. 63/2010.	**250.00**
2	Construction Bailey Bridge within the project area for movement/ accessibility colony to power house	250.00	The location of the Power House and the permanent colony are on the right bank and left bank of the downstream of Doyang River respectively and is about 5 kms apart. The only motorable way of communication between these two locations is approaching through the Lotha Bridge which is outside the project area and falls under the state highway. In case of any disruption in this Lotha Bridge area there is no other way for motorable communication. Therefore, to shorten the distance in between the Power House and the permanent colony and to maintain unhindered road communication in between this two locations it	**Allowed under** under Regulation 14(3)(viii) of the 2014 Tariff Regulations, as the asset is for the benefit of the employee & plant and in turn will facilitate successful and efficient operation of plant.	**250.00**

			is proposed that a Bailey Bridge may be erected within the project premises which will be beneficial for all the operation and maintenance activities of the project apart from benefiting all the employees. If the Bailey Bridge is erected the distance from the Permanent Colony to the Power House would be then of approximately 1.5 Kms and this also will reduce the fuel consumption of the vehicles.		
3	Tail Race Channel Excavation	150.00	Due to landslide the river bed level has increased and affected tail water level of the tailpool area. It is found that there is a loss in Head and Turbine Output. This loss is seen to be almost proportionate to all consequent RWL. All these losses are because of the constricted flow of water and the high bed level of the Tail Race Channel. Therefore, to improve the machine efficiency and to nullify the head loss necessary excavation of the Tail Race Channel needs to be carried out so that optimum generation can be achieved at even lower water levels.	**Not allowed.** The station has been assigned with normative design energy based on the design year flows. If the petitioner is able to generate more than the design energy at even lower water levels by way of tail race excavation, then the petitioner would earn extra incentive @ 90 paise per unit. Petitioner may like to take a call based on cost benefit analysis of increase in generation due to tail race excavation. As such, all expenditure which can increase the generation beyond design energy shall be met from the secondary energy benefits i.e. 90 paise/unit.	**0.00**
4	Conversion of conventional conservators to Air Cell Type	50.00	For GTs the existing conventional conservators are to be replaced by Air Cell Type Conservators	**Allowed under** under Regulation 14(3)(viii) of the 2014 Tariff	**50.00**

	Conservators for 3 nos. GTs		which shall keep a proper moisture free environment of the Transformer resulting more life expectancy and enhancing the performance of the GTs.	Regulations, as the work will facilitate efficient operation of plant.	
Total amount claimed		**700.00**		**Amount allowed**	**550.00**

2017-18

(₹in lakh)

Sl. No.	Assets/ Works	Amount claimed	Justification submitted by the petitioner	Remarks on admissibility	Amount Allowed
1	Construction of additional quarters as per entitlement	200.00	Detail justification elaborated & referred during the year 2014-15 vide sl no.1	**Allowed** under Regulation 14(3)(viii) of the 2014 Tariff Regulations as the work was already allowed during 2009-14 vide order dated 24.12.2012 in petition no. 63/2010.	**200.00**
2	Replacement cooling water system	120.00	Replacement in stage for all three units is required due to erosion and corrosion in the pipeline. Stainless Steel Pipes, Valves, etc. are to be procured to ascertain less corrosion in the future and thereby enhancing the life of the units by maintaining proper temperature of the units.	**Not allowed,** as the replacement of corroded pipes and valves is of revenue nature and shall be booked to O&M expenditure.	**0.00**
Total amount claimed		**320.00**		**Amount allowed**	**200.00**

2018-19

12. No additional capital expenditure has been claimed by the petitioner for 2018-19.

Additional capital expenditure

13. Based on the above, the additional capital expenditure claimed and allowed for the period 2014-19 is as under:

(₹in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Additional capital expenditure claimed	765.00	2022.00	700.00	320.00	0.00
Additional capital expenditure allowed	705.00	1497.00	550.00	200.00	0.00

Deletion

14. The petitioner has claimed the following de-capitalization for the period 2014-19 is as under:

(₹in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
0.00	213.88	10.00	25.00	0.00

15. Considering the fact that the capitalization of expenditure on replacement of assets of revenue nature i.e. replacement of pipes, valves, etc. has not been allowed and the corresponding projected deletions have also been ignored for the purpose of tariff. However, it is observed that during truing up if any asset is de-capitalized from books of accounts then the same will also be de-capitalized for the purpose of tariff provided the same is in the capital base. In case petitioner is able to prove that the de-capitalized asset is not a part of capital base for the purpose of tariff then the de-capitalization will be ignored for the purpose of tariff. In view of the above the de-capitalization considered corresponding to the assets allowed under replacement is as under which is subject to truing up at the time of revision of tariff:

(₹in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19	Total
0.00	206.03	10.00	0.00	0.00	**216.03**

16. The additional capital expenditure allowed for the purpose of tariff is as under:

	2014-15	2015-16	2016-17	2017-18	2018-19
Additional capital expenditure allowed	705.00	1497.00	550.00	200.00	0.00
Less: De-capitalization allowed	0.00	206.03	10.00	0.00	0.00
Net Additional capital expenditure allowed	**705.00**	**1290.97**	**540.00**	**200.00**	**0.00**

Capital Cost for 2014-19

17. As stated, the closing capital cost as on 31.3.2014 is ₹ 63806.14 lakh. The same has been considered as the opening capital cost as on 1.4.2014. Accordingly, the capital cost considered for the purpose of tariff for the period 2014-19 is as under:

(₹ *in lakh*)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	63806.14	64511.14	65802.11	66342.11	66542.11
Additional Capital expenditure allowed	705.00	1290.97	540.00	200.00	0.00
Capital Cost as on 31st March of the year	**64511.14**	**65802.11**	**66342.11**	**66542.11**	**66542.11**

Return on Equity

18. Regulation 24 of the 2014 Tariff Regulations provides as under:

> ***"24. Return on Equity****: (1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 19.*
>
> *(2) Return on equity shall be computed at the base rate of 15.50% for thermal generating stations, transmission system including communication system and run of the river hydro generating station, and at the base rate of 16.50% for the storage type hydro generating stations including pumped storage hydro generating stations and run of river generating station with pondage:*
>
> *Provided that:*
>
> *i). in case of projects commissioned on or after 1st April, 2014, an additional return of 0.50 % shall be allowed, if such projects are completed within the timeline specified in Appendix-I:*
>
> *ii). the additional return of 0.5% shall not be admissible if the project is not completed within the timeline specified above for reasons whatsoever:*
>
> *iii). additional RoE of 0.50% may be allowed if any element of the transmission project is completed within the specified timeline and it is certified by the Regional Power Committee/National Power Committee that commissioning of the particular element will benefit the system operation in the regional/national grid:*
>
> *iv). the rate of return of a new project shall be reduced by 1% for such period as may be decided by the Commission, if the generating station or transmission system is found to be declared under commercial operation without commissioning of any of the Restricted Governor Mode Operation (RGMO)/ Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system:*
>
> *v) as and when any of the above requirements are found lacking in a generating station based on the report submitted by the respective RLDC, RoE shall be reduced by 1% for the period for which the deficiency continues:*
>
> *vi) additional RoE shall not be admissible for transmission line having length of less than 50 kilometers.*

19. Regulation 25 of the 2014 Tariff Regulations provides as under:

"Tax on Return on Equity

(1) The base rate of return on equity as allowed by the Commission under Regulation 24 shall be grossed up with the effective tax rate of the respective financial year. For this purpose, the effective tax rate shall be considered on the basis of actual tax paid in the respect of the financial year in line with the provisions of the relevant Finance Acts by the concerned generating company or the transmission licensee, as the case may be. The actual tax income on other income stream (i.e., income of non generation or non transmission business, as the case may be) shall not be considered for the calculation of "effective tax rate".

(2) Rate of return on equity shall be rounded off to three decimal places and shall be computed as per the formula given below:

Rate of pre-tax return on equity = Base rate / (1-t)

Where "t" is the effective tax rate in accordance with Clause (1) of this regulation and shall be calculated at the beginning of every financial year based on the estimated profit and tax to be paid estimated in line with the provisions of the relevant Finance Act applicable for that financial year to the company on pro-rata basis by excluding the income of non-generation or non-transmission business, as the case may be, and the corresponding tax thereon. In case of generating company or transmission licensee paying Minimum Alternate Tax (MAT), "t" shall be considered as MAT rate including surcharge and cess.

(3) The generating company or the transmission licensee, as the case may be, shall true up the grossed up rate of return on equity at the end of every financial year based on actual tax paid together with any additional tax demand including interest thereon, duly adjusted for any refund of tax including interest received from the income tax authorities pertaining to the tariff period 2014-15 to 2018-19 on actual gross income of any financial year. However, penalty, if any, arising on account of delay in deposit or short deposit of tax amount shall not be claimed by the generating company or the transmission licensee as the case may be. Any under-recovery or over-recovery of grossed up rate on return on equity after truing up, shall be recovered or refunded to beneficiaries or the long term transmission customers/DICs as the case may be on year to year basis.

Ministry of Power vide their letter dated 13/03/2009 has approved financial package in respect of Doyang Hydro Electric Project.

According to the above financial package "the tariff will be enhanced at the rate of 5 per cent during the tariff period five years beginning form 2009-2010. Thereafter, the tariff will so increase in the very first year of tariff period beginning from 2014-2015 to give return of 10 per cent on equity."

20. The rate of Return on Equity (RoE) has been considered as per Financial package approved by the Ministry of Power as under:

	2014-15	2015-16	2016-17	2017-18	2018-19
Base Rate	10.000%	10.000%	10.000%	10.000%	10.000%
Effective Tax Rate	20.961%	30.795%	33.990%	33.990%	33.990%
Rate of ROE (pre-tax)	12.652%	14.450%	15.149%	15.149%	15.149%

21. With regard to tax rate claimed for the purpose of grossing up of RoE, the Commission vide ROP dated 7.4.2015 directed the petitioner to submit clarification/information on the following:

> *"The applicable tax rate for grossing up of Return on Equity as claimed by the petitioner is Minimum Alternate Tax rate for the year 2014-15 and Corporate Tax rate for the years 2015-16 to 2018-19. Clarification/ justification for the change in applicable tax rate claimed"*

22. In response, the petitioner vide affidavit dated 10.6. submitted as under:

> ***2014-15***
>
> "*After availing available MAT credit during the financial year 2014-15, it is estimated that the effective tax rate applicable for NEEPCO for the FY 2014-15 is expected to be the MAT rate only and accordingly the same has been considered.*"
>
> ***2015-16***
>
> "*It is estimated that the during the FY 2015-16, the balance of the MAT credit available will be exhausted resulting in the expected effective tax rate for NEEPCO considered, which is more than MAT rate but lower than corporate tax rate*"
>
> ***2016-17 to 2018-19***
>
> "*It is expected that total MAT credit available will be exhausted during the FY 2015-16. Accordingly, NEEPCO will continue to paying normal corporate tax since the FY 2016-17 and accordingly, the same has been considered".*

23. Accordingly, the tax rates as claimed by the petitioner have been considered for the purpose of determination of tariff on projected basis for the period 2014-19. However, the petitioner is directed to furnish detailed calculation of effective tax rate duly certified by the Auditor, supported by the tax audit report for the respective years.

24. Accordingly, the Return on Equity has been computed as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Gross Notional Equity	32813.23	33024.73	33412.02	33574.02	33634.02
Addition due to additional capital expenditure	211.50	387.29	162.00	60.00	0.00

Closing Equity	33024.73	33412.02	33574.02	33634.02	33634.02
Average Equity	32918.98	33218.38	33493.02	33604.02	33634.02
Rate of ROE (pre-tax)	12.652%	14.450%	15.149%	15.149%	15.149%
Return on Equity	**4164.88**	**4799.99**	**5073.93**	**5090.75**	**5095.29**

Interest on Loan

25. Regulation 26 of the 2014 Tariff Regulations provides as under:

> ***"26. Interest on loan capital:*** *(1)The loans arrived at in the manner indicated in regulation 19 shall be considered as gross normative loan for calculation of interest on loan.*
>
> *(2) The normative loan outstanding as on 1.4.2014 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2014 from the gross normative loan.*
>
> *(3) The repayment for each of the year of the tariff period 2014-19 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalisation of such asset.*
>
> *(4) Notwithstanding any moratorium period availed by the generating company or the transmission licensee, as the case may be, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the depreciation allowed for the year or part of the year.*
>
> *(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio after providing appropriate accounting adjustment for interest capitalized:*
>
> *Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered:*
>
> *Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.*
>
> *(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.*
>
> *(7) The generating company or the transmission licensee, as the case may be, shall make every effort to re-finance the loan as long as it results in net savings on interest and in that event the costs associated with such re-financing shall be borne by the beneficiaries and the net savings shall be shared between the beneficiaries and the generating company or the transmission licensee, as the case may be, in the ratio of 2:1.*
>
> *(8) The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing.*

(9) In case of dispute, any of the parties may make an application in accordance with the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999, as amended from time to time, including statutory re-enactment thereof for settlement of the dispute:

Provided that the beneficiaries or the long term transmission customers /DICs shall not withhold any payment on account of the interest claimed by the generating company or the transmission licensee during the pendency of any dispute arising out of re-financing of loan."

26. The normative loan of the project has already been repaid. The normative loan on account of admitted additional capital expenditure during the respective year of the entire period have also been considered as paid fully, as the admitted depreciation is more than the amount of normative loan in these years. As such Interest on Loan during the period 2014-19 is Nil.

Depreciation

27. Regulation 27 of the 2014 Tariff Regulations provides as under:

"27. Depreciation: *(1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system including communication system or element thereof. In case of the tariff of all the units of a generating station or all elements of a transmission system including communication system for which a single tariff needs to be determined, the depreciation shall be computed from the effective date of commercial operation of the generating station or the transmission system taking into consideration the depreciation of individual units or elements thereof.*

Provided that effective date of commercial operation shall be worked out by considering the actual date of commercial operation and installed capacity of all the units of the generating station or capital cost of all elements of the transmission system, for which single tariff needs to be determined.

(2) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission. In case of multiple units of a generating station or multiple elements of transmission system, weighted average life for the generating station of the transmission system shall be applied. Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

(3) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset:

Provided that in case of hydro generating station, the salvage value shall be as provided in the agreement signed by the developers with the State Government for development of the Plant:

Provided further that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciated value shall correspond to the percentage of sale of electricity under long-term power purchase agreement at regulated tariff:

Provided also that any depreciation disallowed on account of lower availability of the generating station or generating unit or transmission system as the case may be, shall not be allowed to be recovered at a later stage during the useful life and the extended life.

(4) Land other than the land held under lease and the land for reservoir in case of hydro generating station shall not be a depreciable asset and its cost shall be excluded from the capital cost while computing depreciable value of the asset.

(5) Depreciation shall be calculated annually based on Straight Line Method and at rates specified in ***Appendix-II*** *to these regulations for the assets of the generating station and transmission system:*

Provided that the remaining depreciable value as on 31st March of the year closing after a period of 12 years from the effective date of commercial operation of the station shall be spread over the balance useful life of the assets.

(6) In case of the existing projects, the balance depreciable value as on 1.4.2014 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2014 from the gross depreciable value of the assets.

(7) The generating company or the transmission license, as the case may be, shall submit the details of proposed capital expenditure during the fag end of the project (five years before the useful life) alongwith justification and proposed life extension. The Commission based on prudence check of such submissions shall approve the depreciation on capital expenditure during the fag end of the project.

(8) In case of de-capitalization of assets in respect of generating station or unit thereof or transmission system or element thereof, the cumulative depreciation shall be adjusted by taking into account the depreciation recovered in tariff by the de-capitalized asset during its useful services."

28. The COD of the generating station is 8.7.2000. As such, the generating station has completed 12 years of operation as on 8.7.2012, the remaining depreciable value has been spread over the balance useful life of the project. The weighted average rate of depreciation of 5.001%, calculated in terms of the regulations above has been considered for the calculation of depreciation in 2014-15 and the remaining depreciable value has been spread over the balance useful life of the project. Accordingly, depreciation has been worked out as follows:

(₹in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Gross block	63806.14	64511.14	65802.11	66342.11	66542.11
Additional capital expenditure during 2014-19	705.00	1290.97	540.00	200.00	-
Closing gross block	64511.14	65802.11	66342.11	66542.11	66542.11
Average gross block	64158.64	65156.63	66072.11	66442.11	66542.11
Depreciable Value	55260.92	56159.10	56983.04	57316.04	57406.04
Balance Useful life of the asset	21.27	20.27	19.27	18.27	17.27
Remaining Depreciable Value	21734.30	21610.63	21480.66	20704.45	19661.16
Depreciation	**1021.86**	**1066.17**	**1114.75**	**1133.28**	**1138.49**

Operation & Maintenance Expenses

29. Regulation 29 (3) (a) of the 2014 Tariff Regulations provides as under:

29. Operation and Maintenance Expenses:

(3) Hydro Generating Station

(a) Following operations and maintenance expense norms shall be applicable for hydro generating stations which have been operational for three or more years as on 01.04.2014:

(₹in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
3900.10	4159.22	4435.56	4730.26	5044.54

30. The petitioner has claimed the O&M expenses as per the above norms. The generating station is in operation for three or more years as on 1.4.2014. Accordingly, in terms of sub-section (a) of clause (3) of Regulation 29 of the 2014 Tariff Regulations, the year-wise O&M expense norms claimed by the petitioner as above is allowed for the period 2014-19.

Interest on working capital

31. Sub-section (c) of Clause (1) of Regulation 28 of the 2014 Tariff Regulations provides as under:

28. Interest on Working Capital:

(1) The working capital shall cover

(a) Hydro generating station including pumped storage hydro electric generating Station and transmission system including communication system:

(i) Receivables equivalent to two months of fixed cost;

(ii) Maintenance spares @ 15% of operation and maintenance expense specified in regulation 29; and

(iii) Operation and maintenance expenses for one month.

32. Clause (3) of Regulation 28 of the 2014 Tariff Regulations provides that the rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2014 or as on 1st April of the year during the tariff period 2014-15 to 2018-19 in which the generating station or a unit thereof or the transmission system including communication system or element thereof, as the case may be, is declared under commercial operation, whichever is later.

33. Accordingly, receivables equivalent to two months of fixed cost is allowed as under

(₹ in lakh)

2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
1570.28	1731.70	1835.29	1893.14	1950.08

34. Maintenance spares @15% of the O&M expenses is worked out and allowed as under:

(₹ in lakh)

2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
585.02	623.88	665.33	709.54	756.68

35. O&M Expenses for one month is worked out and allowed as under:

(₹ in lakh)

2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
325.01	346.60	369.63	394.19	420.38

36. In terms of the above regulations, Bank Rate of 13.50% (Base Rate + 350 Basis Points) as on 1.4.2014 claimed by the petitioner has been considered in the calculations for working capital.

37. Necessary computations in support of interest on working capital are as under:

(₹ in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Maintenance Spares	585.02	623.88	665.33	709.54	756.68
O & M expenses	325.01	346.60	369.63	394.19	420.38
Receivables	1570.28	1731.70	1835.29	1893.14	1950.08
Total	2480.30	2702.18	2870.25	2996.87	3127.14
Interest on Working Capital	**334.84**	**364.79**	**387.48**	**404.58**	**422.16**

38. Accordingly, the annual fixed charges approved for the generating station for the period from 1.4.2014 to 31.3.2019 is summarized as under:

(₹ in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Return on Equity	4164.88	4799.99	5073.93	5090.75	5095.29
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Depreciation	1021.86	1066.17	1114.75	1133.28	1138.49
Interest on Working Capital	334.84	364.79	387.48	404.58	422.16
O & M Expenses	3900.10	4159.22	4435.56	4730.26	5044.54
Annual Fixed Charges	**9421.67**	**10390.17**	**11011.73**	**11358.87**	**11700.49**

Normative Annual Plant Availability Factor

39. Clause (4) of Regulation 37 of the 2014 Tariff Regulations provides for the Normative Annual Plant Availability Factor (NAPAF) for hydro generating stations already in operation. Accordingly, the NAPAF of 73% has been considered for this generating station.

Design Energy

40. The Commission in its order dated 24.12.2012 in Petition No.63/2010 had approved the annual Design Energy (DE) of 227.24 Million units for the period 2009-14 in respect of this generating station. This DE has been considered for this generating station for the period 2014-19 as per month-wise details as under:

Month	Design Energy (MUs)
April	11.52
May	12.79
June	22.90
July	14.29
August	55.80
September	31.96
October	20.01
November	11.52
December	11.90
January	11.90
February	10.75
March	11.90
Total	**227.24**

Enhancement of O&M expenses

41. The petitioner in the petition has submitted that the salary & wages of the employees of the petitioner will be due from 1.1.2017. It has further submitted that the petition has been submitted considering the O&M expenses in terms of Regulation 29(3)(a) of the 2014 Tariff Regulations and the yearly escalation provided in the O&M expenses may not cover the enhanced employee cost due to the aforesaid pay revision. Accordingly, the petitioner has sought liberty to approach the Commission for seeking enhancement in the O&M expenses with effect from 1.1.2017 due to pay revision, if any, under Regulation 54 and 55 of the 2014 Tariff Regulations. The matter has been examined. On this issue, the Commission in the Statement of Reasons to the 2014 Tariff Regulations has observed as under:

> *"29.26 Some of the generating stations have suggested that the impact of pay revision should be allowed on the basis of actual share of pay revision instead of normative 40% and one generating company suggested that the same should be considered as 60%. In the draft Regulations, the Commission had provided for a normative percentage of employee cost to total O&M expenses for different type of generating stations with an intention to provide a ceiling limit so that it does not lead to any exorbitant increase in the O&M expenses resulting in spike in tariff. The Commission would however, like to review the same considering the macro economics involved as these norms are also applicable for private generating stations. In order to ensure that such increase in employee expenses on account of pay revision in case of central generating stations and private generating stations are considered appropriately, the Commission is of the view that it shall be examined on case to case basis, balancing the interest of generating stations and consumers"*

42. Accordingly, the prayer of the petitioner for enhancement of O&M expenses if any, due to pay revision maybe examined by the Commission, on a case to case basis, subject to the implementation of pay revision as per DPE guidelines and the filing of an appropriate application by the petitioner in this regard.

Application Fee and Publication Expenses

43. The petitioner has sought the reimbursement of filing fee and also the expenses incurred towards publication of notices for application of tariff for the period 2014-19. The petitioner has deposited the filing fees for the period 2014-19 in terms of the provisions of the

Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2012. The petitioner has incurred charges towards publication of the said tariff petition in the newspapers. Accordingly, in terms of Regulation 52 of the 2014 Tariff Regulations and the decision of the Commission in order dated 6.1.2016 in Petition No.232/GT/2014, the petitioner is entitled to recover the filing fees and the expenses incurred on publication of notices for the period 2014-19 directly from the respondents. Accordingly, the expenses incurred by the petitioner towards tariff application filing fees and publication of notices in connection with the present petition shall be directly recovered from the respondent beneficiaries on pro rata basis.

44. The annual fixed charges approved for the period 2014-19 as above are subject to truing-up in terms of Regulation 8 of the 2014 Tariff Regulations.

45. Petition No. 43/GT/2015 is disposed of in terms of the above.

-Sd/-	***-Sd/-***	***-Sd/-***
(A.S. Bakshi)	**(A.K.Singhal)**	**(Gireesh B. Pradhan)**
Member	**Member**	**Chairperson**