CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 396/GT/2020

Coram:
Shri I.S. Jha, Member
Shri Arun Goyal, Member
Shri Pravas Kumar Singh, Member

Date of Order: 27th September, 2022

IN THE MATTER OF

Petition for determination of tariff of Bhilai Expansion Power Plant (500 MW) for the period from 1.4.2019 to 31.3.2024.

AND

IN THE MATTER OF

NTPC-SAIL Power Company Limited,
4th Floor, 15 Bhikaiji Cama Place,
New Delhi – 110066. **….Petitioner**

Vs

1. DNH Power Distribution Corporation Limited,
UT of DNH, Silvassa – 396230.

2. Electricity Department,
Administration of Daman & Diu,
Daman – 396210.

3. Chhattisgarh State Power Distribution Company Limited,
Vidyut Sewa Bhawan, Dagania,
Raipur – 492001.

4. Steel Authority of India Limited,
Ispat Bhawan, Lodhi Road,
New Delhi – 110003. **….Respondents**

Parties Present:
Shri Tridib Deb, NTPC-SAIL
Shri Soumitra Samanta, NTPC-SAIL
Shri Dilip Kumar Tiwari, NTPC-SAIL

ORDER

This petition has been filed by the Petitioner, NTPC SAIL Power Company Limited for determination of tariff of Bhilai Expansion Power Plant (2 x 250 MW) (hereinafter referred to as 'the generating station') for the period from 1.4.2019 to 31.3.2024, in accordance with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as 'the 2019 Tariff Regulations').

2. The Petitioner is a joint venture company of NTPC Ltd. and Steel Authority of India Ltd. (SAIL) having equity participation of 50:50. The power generated from the generating station will be consumed to the extent of 51% for captive requirement of SAIL and the balance power is to be supplied to the Respondents 1 to 3 in terms of the Power Purchase Agreements (PPA) entered into between them. The generating station with a capacity of500 MW comprises of two units of 250 MW each. Unit-I and Unit-II of the generating station achieved COD on 22.4.2009 and 21.10.2009 respectively.

3. The Commission vide its order dated 2.8.2016 in Petition No. 257/GT/2014 had determined the tariff of the generating station for the period from 1.4.2014 to 31.3.2019. Subsequently, in Petition No.192/GT/2020 filed by the Petitioner for truing up of tariff of the generating station, for the 2014-19 tariff period, the Commission vide its order dated 4.8.2022 approved the capital cost and the annual fixed charges as under:

Annual Fixed Charges allowed

(Rs. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	13908.82	13926.89	13842.34	13726.63	13715.14
Interest on Loan	11610.49	10314.91	9022.93	7159.23	5861.09
Return on Equity	15654.49	15747.41	15752.43	15748.72	15803.66
Interest on Working Capital	4389.23	4418.48	4434.20	4512.94	4593.04
O&M Expenses	13661.70	14512.56	15331.91	16328.24	18081.79
Total	**59224.73**	**58920.25**	**58383.80**	**57475.75**	**58054.71**

Capital Cost allowed

(Rs. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening capital cost	275920.76	276183.35	276498.71	276353.22	276373.12
Add: additional capital expenditure	262.59	315.36	(-)145.49	19.90	404.65
Closing capital cost	**276183.35**	**276498.71**	**276353.22**	**276373.12**	**276777.77**
Average capital cost	276052.05	276341.03	276425.96	276363.17	276575.44

Present Petition

4. The Petitioner vide affidavit dated 22.1.2020 had filed the present Petition for determination of tariff of the generating station for the 2019-24 tariff period. Subsequently, the Petitioner, vide affidavit dated 24.5.2021, has revised its claim for annual fixed charges and capital cost as under:

Annual Fixed Charges claimed

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	14225.89	14255.96	14339.77	6182.76	6215.11
Interest on Loan	4598.15	3458.58	2374.74	1624.46	1137.14
Return on Equity	15067.60	15092.86	15149.59	15204.31	15216.49
Interest on Working Capital	4065.98	4062.12	4120.37	4031.76	4069.85
O&M Expenses	20576.61	20780.14	22237.27	23139.77	24081.17
Total	**58534.23**	**57649.66**	**58221.73**	**50183.06**	**50719.76**

Capital Cost claimed

(a) Capital cost eligible for Return on Equity at normal rate

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Opening capital cost	277170.39	277563.86	277753.86	278153.86	278153.86
Add: Addition during the year/ period	393.47	190.00	400.00	0.00	0.00
Less: De-capitalization during the year/ period	0.00	0.00	0.00	0.00	0.00
Less: Reversal during the year/ period	0.00	0.00	0.00	0.00	0.00
Add: Discharges during the year/ period	0.00	0.00	0.00	0.00	0.00
Closing capital cost	**277563.86**	**277753.86**	**278153.86**	**278153.86**	**278153.86**
Average capital cost	277367.13	277658.86	277953.86	278153.86	278153.86

(b) Capital Cost eligible for Return on Equity at weighted average rate of interest

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Opening capital cost	0.00	0.00	589.30	2677.90	3490.90
Add: Addition during the year/ period	0.00	589.30	2088.60	813.00	0.00
Less: De-capitalization during the year/ period	0.00	0.00	0.00	0.00	0.00
Less: Reversal during the year/ period	0.00	0.00	0.00	0.00	0.00
Add: Discharges during the year/ period	0.00	0.00	0.00	0.00	0.00
Closing capital cost	**0.00**	**589.30**	**2677.90**	**3490.90**	**3490.90**
Average capital cost	0.00	294.65	1633.60	3084.40	3490.90

5. The Petition was heard on 17.3.2021 and the Commission, after directing the Petitioner to file certain additional information, reserved its order in the petition. In compliance to the said direction, the Petitioner has submitted the additional information vide its affidavit dated 24.5.2021, after serving copies on the Respondents. The Respondent, CSPDCL has filed its reply vide affidavit dated 21.5.2021 and the Petitioner vide affidavit dated 22.6.2021 has filed its rejoinder to the said reply. As order in this petition could not be passed prior to Member (ex-officio) demitting office, this petition was re-listed and heard through video conferencing on 29.6.2021 and the Commission after directing the Petitioner to file certain additional information, reserved its order in the matter. However, as order in the petition could not be passed prior to the Chairperson demitting office, this petition was re-listed and heard through video conferencing on 14.7.202 and the Commission reserved its order. Based on the submissions of the parties, the documents available on record and on prudence check, we proceed to determine the tariff of the generating station for the 2019-24 tariff period, as stated in the subsequent paragraphs.

Capital Cost

6. Regulation 19(1) of the 2019 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 19 of the 2019 Tariff Regulations provides as under:

"(3) The Capital cost of an existing project shall include the following:

(a) Capital cost admitted by the Commission prior to 1.4.2019 duly trued up by excluding liability, if any, as on 1.4.2019;

(b) Additional capitalization and de-capitalization for the respective year of tariff as determined in accordance with these regulations;

(c) Capital expenditure on account of renovation and modernisation as admitted by this Commission in accordance with these regulations;

(d) Capital expenditure on account of ash disposal and utilization including handling and transportation facility;

(e) Capital expenditure incurred towards railway infrastructure and its augmentation for transportation of coal upto the receiving end of generating station but does not include the transportation cost and any other appurtenant cost paid to the railway; and

(f) Capital cost incurred or projected to be incurred by a thermal generating station, on account of implementation of the norms under Perform, Achieve and Trade (PAT) scheme of Government of India shall be considered by the Commission subject to sharing of benefits accrued under the PAT scheme with the beneficiaries."

7. The Petitioner has claimed the opening capital cost of Rs.277170.39 lakh as on 1.4.2019. However, the Commission vide its order dated 4.8.2022 in Petition No. 192/GT/2020 had approved the closing capital cost of Rs.276777.77 lakh, on cash basis, as on 31.3.2019. Accordingly, in terms of Regulation 19(3) of the 2019 Tariff Regulations, the capital cost of Rs.276777.77 lakh, on cash basis, has been considered, as on 1.4.2019, for the purpose of determination of tariff, for the 2019-24 tariff period.

Additional Capital Expenditure

8. Regulations 25 and 26 of the 2019 Tariff Regulations, provides as under:

25. Additional Capitalization within the original scope and after the cut-off date:

(1) The additional capital expenditure incurred or projected to be incurred in respect of an existing project or a new project on the following counts within the original scope of work and after the cut-off date may be admitted by the Commission, subject to prudence check:

(a) Liabilities to meet award of arbitration or for compliance of the directions or order of any statutory authority, or order or decree of any court of law;

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

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

(d) Liability for works executed prior to the cut-off date;

(e) Force Majeure events;

(f) Liability for works admitted by the Commission after the cut-off date to the extent of discharge of such liabilities by actual payments; and

(g) Raising of ash dyke as a part of ash disposal system.

(2) In case of replacement of assets deployed under the original scope of the existing project after cut-off date, the additional capitalization may be admitted by the Commission, after making necessary adjustments in the gross fixed assets and the cumulative depreciation, subject to prudence check on the following grounds:

(a) The useful life of the assets is not commensurate with the useful life of the project and such assets have been fully depreciated in accordance with the provisions of these regulations;

(b) The replacement of the asset or equipment is necessary on account of change in law or Force Majeure conditions;

(c) The replacement of such asset or equipment is necessary on account of obsolescence of technology; and

(d) The replacement of such asset or equipment has otherwise been allowed by the Commission.

26. Additional Capitalization beyond the original scope

(1) 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 beyond the original scope, may be admitted by the Commission, subject to prudence check:

(a) Liabilities to meet award of arbitration or for compliance of order or directions of any statutory authority, or order or decree of any court of laokay w;

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

(c) Force Majeure.~~;~~

(d) Need for higher security and safety of the plant as advised or directed by appropriate Indian Government Instrumentality or statutory authorities responsible for national or internal security;

(e) Deferred works relating to ash pond or ash handling system in additional to the original scope of work, on case to case basis:

Provided also that if any expenditure has been claimed under Renovation and Modernization (R&M) or repairs and maintenance under O&M expenses, the same shall not be claimed under this Regulation;

(f) Usage of water from sewage treatment plant in thermal generating station.

(2) In case of de-capitalization of assets of a generating company or the transmission licensee, as the case may be, the original cost of such asset as on the date of decapitalization shall be deducted from the value of gross fixed asset and corresponding loan as well as equity shall be deducted from outstanding loan and the equity respectively in the year such de-capitalization takes place with corresponding adjustments in cumulative depreciation and cumulative repayment of loan, duly taking into consideration the year in which it was capitalized."

9. The year wise, projected additional capital expenditure claimed by the Petitioner are summarized and examined below:

(Rs. in lakh)

	Regulation	2019-20	2020-21	2021-22	2022-23	2023-24
Works within original scope, change-in-law etc. eligible for ROE at Normal Rate						
(A) Items already allowed						
Ash Dyke Raising	26(1)(e)	250.00	50.00	0.00	0.00	0.00
Construction of concrete paving for wagon inspection at MGR	26(1)(d)	11.00	0.00	0.00	0.00	0.00
Bomb Calorimeter		34.47	0.00	0.00	0.00	0.00
(B) New Items						
Implementation of Automatic Generation Control	26(1)(b)	98.00	0.00	0.00	0.00	0.00
Compressor for Ash Evacuation System	26(1)(b) & 26(1)(e)	0.00	100.00	0.00	0.00	0.00
Zero Liquid Discharge System	26(1)(b)	0.00	40.00	0.00	0.00	0.00
CLO2 System	26(1)(b) & 26(1)(d)	0.00	0.00	400.00	0.00	0.00
Sub-Total		**393.47**	**190.00**	**400.00**	**0.00**	**0.00**
Works beyond original scope excluding add-cap due to change-in-law eligible for ROE at Weighted Average Rate of Interest (WAROI)						
LT ACB Retrofitting	26(1)(d)	0.00	60.00	0.00	0.00	0.00
Foam Tender		0.00	64.00	0.00	0.00	0.00
Installation of Security CCTV System		0.00	150.00	0.00	0.00	0.00
Hydraulic Platform for Safety as per recommendation		0.00	74.00	0.00	0.00	0.00
CISF Fire Fighting Equipment's and Systems		0.00	11.30	12.60	0.00	0.00
Dozer Model BD 155	25(2)(a)	0.00	230.00	0.00	0.00	0.00
IP Blade Rotor	76	0.00	0.00	1600.00	0.00	0.00
Fire Tender	26(1)(d)	0.00	0.00	64.00	0.00	0.00
Installation of Economizer Coil Handling platform	26(1)(d) read with 76 & 77	0.00	0.00	412.00	413.00	0.00
HMI Upgradation of MAX DNA DCS	25(2)(c) read with 76 &77	0.00	0.00	0.00	400.00	0.00
Sub-Total		**0.00**	**589.30**	**2088.60**	**813.00**	**0.00**
Additional capital expenditure claimed (on projected basis)		**393.47**	**779.30**	**2488.60**	**813.00**	**0.00**

(A) Items already allowed by Commission

Ash Dyke Raising Lagoon 1

10. The Petitioner has claimed projected additional capital expenditure of Rs. 250.00 lakh in 2019-20 and Rs.50 lakh in 2020-21, towards Ash dyke raising works, under Regulation 26(1)(e) of the 2019 Tariff Regulations. In justification to the same, the Petitioner has submitted that the expenses towards ash dyke raising were approved by the Commission in its order dated 2.8.2016 in Petition No. 257/GT/2014. It has also submitted that the ash dyke has been operational since 28.3.2019 and the balance work pertaining to drains, roads and turfing which is in progress, shall be completed during the 2019-24 tariff period.

11. The matter has been considered. It has been observed that the Commission in its order dated 2.8.2016 in Petition 257/GT/2014 had allowed an amount of Rs. 613.91 lakh towards Ash dyke raising under Regulation 14(3)(iv) of the 2014 Tariff Regulations. The Petitioner has already claimed an amount of Rs.412.47 (on accrual basis) in Petition no. 192/GT/2020, pertaining to truing up tariff of the generating station for the 2014-19 tariff period. The Petitioner has claimed the projected additional capital expenditure towards ash dyke raising under Regulation 26(1)(e) of the 2019 Tariff Regulations. It is however noticed that the Commission vide its order dated 2.8.2016 in Petition No. 257/GT/2014 had approved the additional capital expenditure under Regulation 14(3)(iv) of the 2014 Tariff Regulations. Since, the ash generation and ash disposal are a continuous process to be carried out from time to time during the operating life of the plant, in order to ensure successful running of the plant, the projected additional capital expenditure claimed by

the Petitioner towards ash dyke raising of Rs. 250.00 lakh in 2019-20 and Rs.50 lakh in 2020-21 is allowed under Regulation 25(1)(g) of the 2019 Tariff Regulations.

Construction of concrete paving for wagon inspection at MGR

12. The Petitioner has claimed additional capital expenditure for Rs. 11 lakh in 2019-20 towards Construction of concrete paving for wagon inspection at MGR under Regulation 26(1)(d) of 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that Commission had approved an amount of Rs. 44 lakh in respect of the said works in its order dated 2.8.2016 in Petition No. 257/GT/2014 for the 2014-19 tariff period and the same is a spill over item, as the work is in progress.

13. The matter has been considered. It has been observed that the Commission in its order dated 2.8.2016 in Petition 257/GT/2014 had approved an amount of Rs. 22 lakh under Regulation 14(3)(iii) towards the Civil works for MGR based on the circular dated 23.5.2013 from the Vigilance Department, recommending these works for the security and safety of the plant. In view of this, and since these assets/works are spill over works which are in progress and is expected to be completed during the 2019-24 tariff period, we allow the projected additional capital expenditure of the same, under Regulation 26(1)(d) of 2019 Tariff Regulations.

Bomb Calorimeter

14. The Petitioner has claimed additional capital expenditure of Rs.34.47 lakh in 2019-20 towards Bomb calorimeter under Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that the Commission in its order dated 2.8.2016 in Petition 257/GT/2014 had allowed the projected additional capital

expenditure of Rs.25 lakh towards this asset. The Petitioner has further submitted that as the item was capitalized during April 2019.

15. The matter has been considered. It has been observed that the Petitioner has claimed an expenditure of (-) Rs.0.24 lakh on cash basis and Rs. 34.23 lakh, on accrual basis, along with an undischarged liability of Rs.34.47 lakh, towards the said asset during the true up of the 2014-19 tariff period. Accordingly, the Commission vide order dated 192/GT/2020 dated 4.8.2022 had allowed an amount of (-) Rs.0.24 lakh on cash basis for the said asset. Further, in the said order, the un-discharged liabilities of Rs. 25.24 lakh against this asset was also allowed, It has been observed that the Petitioner has claimed the amount of undischarged liability i.e., 34,47 lakh claimed in the 2014-19 tariff period against the item as additional capitalization during 2019-20.

16. In view of the above, an amount of Rs.25.24 lakh is allowed against Bomb Calorimeter in 2019-20. The Petitioner is further directed to submit the details of liabilities actually discharged against this item in Form 18 at the time of truing up of 2019-24 Tariff Period.

(B) New Claims

Implementation of Automatic Generation Control

17. The Petitioner has claimed additional capital expenditure of Rs.98.00 lakh in 2019-20 towards the Implementation of Automatic Generation Control system under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the said expenditure has been claimed based on the directions of the Commission in its order dated 2.8.2019 in Petition No. 319/RC/2018.

18. The matter has been considered. It has been observed that in order dated 2.8.2019 in Petition No. 319/RC/2018, the Commission had directed as under:

> *"All thermal ISGS stations with installed capacity of 200 MW and above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC are directed to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by NLDC. NLDC shall notify the said requirements within one month of this order"*

19. It is therefore evident that the additional capital expenditure claimed by the Petitioner is for compliance to the directions contained in order dated 2.8.2019 in Petition 319/RC/2018. This according to us, is a change in law event and therefore, the claim of the Petitioner is allowed under Regulation 26(1)(b) of the 2019 Tariff Regulations.

Compressor for Ash Evacuation System

20. The Petitioner has claimed additional capital expenditure of Rs.100 lakh towards Compressor for dry ash evacuation system in 2020-21 under Regulation 26(1)(b) and 26(1)(e) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that as per the directive of the Environment authorities, 100% ash utilization is compulsory. The Petitioner has further submitted that the 100% ash utilization has also been directed by Chhattisgarh Environment Conservation Board (CESB) on consent to operate dated 21.3.2018.

21. The Respondent, CSPDCL has submitted that the Petitioner has claimed additional capitalization towards Compressor for Ash Evacuation System in 2020-21 along with additional cost and hence the Commission may not consider this separately as being part of the capital cost. In response, the Petitioner has submitted that the claim for projected additional capital expenditure for the said asset is in terms of Regulation 26(1)(b) (change in law) read with Regulation 26(1)(e) (deferred work of ash) of the 2019

Tariff Regulations. It has also submitted that the expenditure towards the said item has arisen on account of the MoEF&CC notification dated 25.1.2016, which mandates 100% ash utilization by thermal power plants and the Commission in its order dated 5.11.2018 in Petition 172/MP/2016 had considered the MoEF&CC notification as change in law event.

22. The matter has been considered. The Petitioner has claimed projected additional capital expenditure under Change in law/ compliance to existing law and deferred ash works, based on the 'consent to operate' granted by the CECB vide its letter dated 21.3.2018 which is valid for the period from 1.4.2018 to 31.3.2023. It is also noticed that Clause 2(10) of the MoEFCC notification dated 25.1.2016 provides as under:

> *"Every Coal of lignite based thermal power plant shall install dedicated dry ash silos having separate access roads so as to ease the delivery of fly ash."*

23. In our view, the asset claimed by the Petitioner would help in reducing the burden of ash disposal in the ash dyke area, which will reduce the regular time to time capitalization of expenditure for raising of ash dyke and environmental ground water pollution. In this background and keeping in view that the additional expenditure claimed is for compliance with the existing norms under the MOEF& CC notification and the directions of CECB, we allow the claim of the Petitioner, under Regulation 26(1)(b) of the 2019 Tariff Regulations. The Petitioner is, however, directed to furnish the details of the revenue earned from the sale of fly ash (excluding transportation charges if any paid by the Petitioner) and a copy of accounts, duly certified by the auditor, as required to be mandatorily maintained by the Petitioner in terms of the said notification, at the time of truing up of tariff.

Zero Liquid Discharge System

24. The Petitioner has claimed additional capital expenditure of Rs.40.00 lakh in 2020-21 towards Zero Liquid Discharge System under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that 'Consent to Operate' granted by CECB vide its letter dated 21.3.2018 under the Water (Prevention and control of Pollution) Rules, is valid for the period from 1.4.2018 to 31.3.2023 and the same has mandated the generating station, to maintain Zero Liquid Discharge. The Petitioner has further submitted that the works under this head will help to achieve the mandate of statuary rules.

25. The matter has been considered. It has been observed that the Petitioner has claimed the projected additional capitalization towards the said works under Regulation 26(1)(b) of the 2019 Tariff Regulations. In support of the claim, the Petitioner has submitted the copy of the CECB consent letter dated 21.3.2018, wherein, Clause 4 of the said letter provides as under:

> *"Industry shall operate and maintain the effluent treatment system efficiency and regularly. Industry shall ensure treated effluent quality within the standards prescribed by Board published in gazette notification dated 25.3.88. the treated effluent shall be utilized in plant operations or for plantation within premises. All the pollution control systems shall be kept in good running conditions all the time and failure (if any), shall be immediately rectified without delay otherwise, similar alternate arrangements shall be made. In the event of failure of any pollution control systems adopted by the industry, the respective production until shall not be started until the control measures are rectified to achieve the desired efficiency. Industry shall not discharge any treated/ untreated effluent into the river or any surface water bodies. No effluent shall be discharged outside the factory premises in any circumstances; hence zero discharge conditions outside the factory premises shall be maintained at all the time. "*

26. It is observed that the CECB in its letter has mandated the generating station to ensure that the effluents are utilized within the premises of the plant, and also to ensure that no effluents are discharged out from the Plant premises. In view of this, the projected

additional capital expenditure of Rs. 40.00 lakh claimed towards Zero Liquid Discharge system is allowed under Regulation 26(1)(b) of the 2019 Tariff Regulations.

ClO_2 Package

27. The Petitioner has claimed projected additional capital expenditure of Rs.400.00 lakh in 2021-22 towards ClO_2 package under Regulation 26(1)(b) read with Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that at present Chlorine gas is being doze directly at various stages of water treatment to maintain water quality and to inhibit organic growth in the water retaining structures/ equipment such as clarifiers, storage tanks, cooling towers, condenser tubes & piping etc. It has also submitted that Chlorine dosing is done from chlorine stored in cylinders/ tonners and that Chlorine gas is very hazardous and may prove fatal in case of leakage; handling and storage of same involves risk to the life of public at large. Accordingly, the Petitioner has submitted that in the interest of public safety, the chlorine dozing system is being replaced by Chlorine Di-oxide (ClO_2) system, which is much safer and less hazardous than Chlorine dozing system. It has added that in the proposed scheme, ClO_2 shall be produced on site, by use of commercial grade HCl and sodium chlorite and thereby avoids handling and storage risk. The Petitioner has further submitted that for the safety of public, the Petitioner is replacing the Chlorination system with ClO2 system.

28. The matter has been considered. The Petitioner has not submitted any documentary evidence to justify that the claim for additional capital expenditure for this generating station is based on a change in law event in terms of Regulation 26(1)(b) of the 2014 Tariff Regulations. It has also not demonstrated that the said claim is based on

any specific direction or advice from any Governmental or statutory authorities, with regard to the requirement of this item for the safety and security of the generating station, in terms of Regulation 26(1)(d) of the 2019 Tariff Regulations. It is also noticed that similar claims of NTPC in some of its generating stations had not been allowed, in the tariff orders issued for the 2019-24 tariff period. Accordingly, the projected additional capital expenditure claimed by the Petitioner is not allowed.

LT ACB Retrofitting

29. The Petitioner has claimed additional capital expenditure for Rs. 60.00 lakh in 2020-21 towards Low Tension Air Circuit Breakers (LT ACB) Retrofitting under Regulation 26 (1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that in order to ensure safety, drives of more than 100 kw, are to be retrofitted with LT ACB, to avoid flash over for safety of equipment, as well as safety of the Personnel. It has further submitted that use of breakers for LT Motors >100 kW would enhance reliability of the system.

30. The matter has been examined. Though the Petitioner has claimed projected additional capital expenditure of this asset, under Regulation 26(1)(d) of the 2019 Tariff Regulations, it has not been able to demonstrate through documentary evidence, that the requirement of this asset, is based on any specific directions or advice from any Governmental or statutory authorities as regards to the requirement of this item. In view of this, the claim of the Petitioner is not allowed.

Foam Tender & Water Tender

31. The Petitioner has claimed additional capital expenditure for Rs. 64.00 lakh each towards the Procurement of foam tender and Water Tender in 2020-21 and 2021-22

respectively, under Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that as per the recommendation of Standing Advising Committee of the Ministry of Home affairs, GOI, and as per letter dated 7.5.2019 of the Deputy Commandant, CISF such Foam tender & Water tender are to be procured in view of safety of the generating station. The Petitioner has also submitted the copy of letter from the Deputy Commandant, CISF.

32. The matter has been examined. It is observed that the claim of the Petitioner for projected additional capital expenditure for this asset, is based on the recommendations of CISF, which is a statutory body. In the recommendation letter, it has been indicated that foam tenders and water tenders, available at site have completed their service life and are not working properly, and that there is no annual maintenance contract for these items. It has also been mentioned that there is huge storage of highly inflammable oil at various locations in the plant and accordingly recommended the Procurement of new Foam and water tender. Keeping in view that the additional capital expenditure claimed by the Petitioner is based on the recommendations of CISF, which is for safety of the generating station, the claim is allowed.

Installation of Security CCTV System

33. The Petitioner has claimed additional capital expenditure for Rs. 150.00 lakh in 2020-21 towards the Installation of security CCTV system under Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the projected additional capital expenditure towards the work is being claimed on the recommendation of CISF.

34. We have examined the matter. It has been observed that the Petitioner in justification of its claim has submitted the minutes of the security review meeting with CISF. On perusal of minutes of the meeting, it could not be made out as to whether the issue related to the installation of CCTV system. The minutes of meeting evidence the following:

> *"AC CISF informed that as per the security audit recommendation, security surveillance is to be done through extensive use of CCTV. DGM (C&I) informed that CCTV available have been installed at main gate. However, it was informed that the requirement of CISF can be looked into holistic manner. BUH advised that joint inspection may be done for relocating the 17 Nos. of existing CCTV as per immediate requirement and considering the security sensitivity."*

35. As there is no specific mandate of the CISF for the procurement of new CCTV system, as evident in the minutes of meeting, the claim of the Petitioner is not allowed.

Hydraulic platform for safety

36. The Petitioner has claimed additional capital expenditure for Rs. 74.00 lakh towards Hydraulic platform for safety in 2020-21 under Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that as per the Standard electrical safety procedure, it is been recommended to install the said asset from the safety point of view.

37. The matter has been examined. Though the Petitioner has claimed projected additional capital expenditure of this asset, under Regulation 26(1)(d) of the 2019 Tariff Regulations, it has not been able to demonstrate through documentary evidence, that the requirement of this asset, is based on any specific directions or advice from any Governmental or statutory authorities as regards to the requirement of this item. In view of this, the claim of the Petitioner is not allowed.

CISF Fire Fighting Equipment and Systems

38. The Petitioner has claimed additional capital expenditure for Rs. 11.30 lakh in 2020-21 and Rs. 12.60 lakh in 2021-22 towards the Procurement of CISF fire-fighting equipment and Systems under Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted the recommendation letters from CISF dated 19.7.2019 and 23.7.2019 in support of the claims.

39. The matter has been examined. It is noticed from letters dated 19.7.2019 and 23.7.2019 of the Assistant Commandant Fire (CISF Unit-Bhilai) that the procurement of the firefighting systems and equipment with an estimated cost of Rs. 23.82 lakh, has been recommended for the generating station. Since the additional capital expenditure incurred is based on the recommendations of CISF, which is a statutory authority, the claim of Petitioner is allowed.

Dozer Model BD 155

40. The Petitioner has claimed additional capital expenditure for Rs. 230.00 lakh towards Procurement of Dozer Model BD 155 in 2020-21 under Regulation 25(2)(a) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that as per OEM, the life of the Dozer is 10 years. It has also submitted that since inception, these dozers are running, and therefore, the replacement of Dozers will be done in phased manner.

41. The matter has been considered. It is observed that the Petitioner has claimed the replacement of the existing dozers with new ones. In support of the claim, the Petitioner has submitted the letter from M/s BEML, the OEM, which has recommended the

replacement of the existing dozer. In view of this, the claim of the Petitioner is allowed. However, the Petitioner has not submitted the details of de-capitalization, such as the year of put to use and the estimated de-capitalization value. Therefore, the de-capitalization value has been dealt with under the head 'Assumed deletion' basis as discussed in para 49 of this order.

IP Blade Rotor

42. The Petitioner has claimed additional capital expenditure for Rs.1600 lakh towards the Procurement of IP Blade rotor in 2021-22 under Regulation 76 of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the design of NSPCL IP rotor is different from other 250 MW units at NTPC and the same may not be matched with pool list and spare rotor available for IP module of 250 MW unit and lead time is also very high.

43. We have examined the matter. The Petitioner has claimed the procurement of IP blade rotor apparently as spare. Since, spares are not allowed to be capitalized after the cut-off date of the generating station, in terms of the 2019 Tariff Regulations, the claim of the Petitioner is not allowed, in exercise of the power to relax. However, the Petitioner may claim the amount, if admissible, as Capital Spares under O&M on consumption basis.

Installation of Economizer Coil Handling Platform

44. The Petitioner has claimed additional capital expenditure for Rs. 412.00 lakh in 2021-22 and Rs.413 lakh in 2022-23 towards the Installation of Economizer Coil Handling System under Regulation 26(1)(d) of the 2019 Tariff Regulations read with Regulation 76 and Regulation 77 of the 2019 Tariff Regulations. In justification of the same, the

Petitioner has submitted that the plant is in operation for more than 10 years and there is requirement for the Replacement & Repair of economizer coils in boiler and Platform and is also required for the safe lifting and replacement of economizer tubes.

45. The matter has been considered. Though the Petitioner has claimed projected additional capital expenditure of this asset, under Regulation 26(1)(d) of the 2019 Tariff Regulations, it has not been able to demonstrate through documentary evidence, that the requirement of this asset, is based on any specific directions or advice or based on OEM recommendation. There is also no merit in the claim of the Petitioner to consider the additional capitalization of this item in exercise of the power to relax under Regulation 76 of the 2019 Tariff Regulations. Accordingly, the claim of the Petitioner under this head is not allowed.

HMI upgradation of MAX DNA DCS

46. The Petitioner has claimed additional capital expenditure for Rs. 400.00 lakh towards HMI upgradation of MAX DNA DCS under Regulation 25(2)(c) read with Regulation 76 and Regulation 77 of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that as per the original scope of work, Max DNA system was supplied by M/s BHEL (the OEM) based on windows XP workstations in MAX DNA DCS. It has also submitted that Windows XP has been declared obsolete by Microsoft and M/s BHEL has recommended for HMI Upgrade and this Upgradation of MAX DNA DCS is compulsory for the reliable operation of Units of the generating station. The Petitioner has also submitted the email communication from the M/s BHEL in support of the claim.

47. The matter has been examined. The Petitioner has claimed the upgradation of HMI under Regulation 25(2)(c) of the 2019 Tariff Regulations read with Regulation 76 of the 2019 Tariff Regulations. The documentary evidence submitted by the Petitioner shows that the product support has been withdrawn by Microsoft XP operating system and hence the upgradation of the operating system is required. In view of the above, we allow the projected additional capital expenditure towards the works, on replacement basis, under Regulation 25(2)(c) of the 2019 Tariff Regulations. However, it is observed that the Petitioner has not considered the estimated de-capitalization of the old asset. Accordingly, the decapitalization has been considered under 'Assumed Deletion' as discussed at para 49 of this order.

48. Based on above discussions, the projected additional capital expenditure allowed for the 2019-24 tariff period, is summarized below:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Works within original scope, change-in-law etc. eligible for ROE at Normal Rate					
(a) Items already allowed					
Ash Dyke Raising	250.00	50.00	0.00	0.00	0.00
Construction of concrete paving for wagon inspection at MGR	11.00	0.00	0.00	0.00	0.00
Bomb Calorimeter	25.24	0.00	0.00	0.00	0.00
(b) New Items					
Implementation of Automatic Generation Control	98.00	0.00	0.00	0.00	0.00
Compressor for Ash Evacuation System	0.00	100.00	0.00	0.00	0.00
Zero Liquid Discharge System	0.00	40.00	0.00	0.00	0.00
Dozer Model BD 155	0.00	230.00	0.00	0.00	0.00
CLO2 System	0.00	0.00	0.00	0.00	0.00
HMI Upgradation of MAX DNA DCS	0.00	0.00	0.00	400.00	0.00
Sub-Total (A)	**384.24**	**420.00**	**0.00**	**400.00**	**0.00**
Works beyond original scope excluding add-cap due to change-in-law eligible for ROE at Weighted Average Rate of Interest (WAROI)					

LT ACB Retrofitting	0.00	0.00	0.00	0.00	0.00
Foam Tender	0.00	64.00	0.00	0.00	0.00
Installation of Security CCTV System	0.00	0.00	0.00	0.00	0.00
Hydraulic Platform for Safety as per recommendation	0.00	0.00	0.00	0.00	0.00
CISF Fire Fighting Equipment's and Systems	0.00	11.30	12.60	0.00	0.00
IP Blade Rotor	0.00	0.00	0.00	0.00	0.00
Fire Tender	0.00	0.00	64.00	0.00	0.00
Installation of Economizer Coil Handling platform	0.00	0.00	0.00	0.00	0.00
Sub-Total (B)	0.00	75.30	76.60	0.00	0.00
Additional capital expenditure allowed (on projected basis)	**384.24**	**495.30**	**76.60**	**400.00**	**0.00**

Assumed Deletion

49. As per consistent methodology adopted by the Commission in its orders, the expenditure on replacement of assets, if found justified, is allowed for the purpose of tariff provided that the capitalization of the said asset, is followed by de-capitalization of the gross value of the old asset. However, in certain cases, where the de-capitalization is proposed to be effected during the future years to the year of capitalization of the new asset, the de-capitalization of the old asset for the purpose of tariff is shifted to the very same year in which the capitalization of the new asset is allowed. Such de-capitalization which is not a book entry in the year of capitalization is termed as "Assumed Deletions".

The methodology of arriving at the fair value of the de-capitalized asset, i.e. de - escalation rate of 5% per annum from the COD has been considered in order to arrive at the gross value of old asset in comparison to the cost of new asset. In the present petition, the COD year of the generating station is during 2009-10. We have considered the value of asset under consideration, as on COD as 100 and escalated it @5% till the year during which additional capital expenditure is claimed against replacement of the same. The amount claimed for additional capital expenditure against this asset is multiplied by the derived ratio from above two values i.e., value in COD year divided by value in additional capitalized year to work out the de-capitalization amount. However, the Petitioner is granted liberty to furnish the actual gross value of replaced assets at the time of truing up exercise and the same will be considered in accordance with law.

50. The Petitioner has claimed additional capital expenditure for certain assets/ works but has not furnished the estimated de-capitalized value of the old, replaced assets/works.

51. Accordingly, in terms of the above methodology, the value of 'assumed deletions' considered for the replaced asset for the purpose of tariff is detailed as under:

(Rs. in lakh)

S No.	Details of Asset	Additions claimed by Petitioner for new assets on replacement	De-capitalization on value of old asset claimed	Assumed Deletion for Old Assets Allowed
2020-21				
1	Dozer model BD 155	230.00	0.00	134.48
2022-23				
2	HMI UPGRADATION OF MAX DNA DCS	400.00	0.00	212.13

Undischarged Liabilities

52. The balance of undischarged liabilities as on 31.3.2019, as per order dated 4.8.2022 in Petition No. 192/GT/2020 is Rs. 353.42 lakh. The Petitioner has not claimed the creation of any additional undischarged liabilities and discharges of undischarged liabilities during the 2019-24 tariff period. However, as directed vide paragraph 50 of the order dated 4.8.2022, the Petitioner shall submit the detailed reconciliation of the discharges, additions and reversal of liabilities, at the time of truing-up of tariff for the

2019-24 tariff period. Accordingly, the undischarged liabilities shall be reviewed at the time of truing up of tariff for the 2019-24 tariff period.

Capital Cost

53. Based on the above, the capital cost allowed for the generating station for the 2019-24 tariff period is as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Opening Capital Cost	276777.77	277162.01	277522.83	277599.43	277787.31
Add: Additional capital expenditure	384.24	495.30	76.60	400.00	0.00
Less: De-capitalization (Assumed Deletion)	0.00	(-)134.48	0.00	(-)212.13	0.00
Closing Capital Cost	**277162.01**	**277522.83**	**277599.43**	**277787.31**	**277787.31**
Average Capital Cost	276969.89	277342.42	277561.13	277693.37	277787.31

Debt Equity Ratio

54. Regulation 18 of the 2019 Tariff Regulations provides as under:

"18. Debt-Equity Ratio: (1) For a new project, the debt-equity ratio of 70:30 as on date of commercial operation shall be considered. If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan:

Provided that:

i. where equity actually deployed is less than 30% of the capital cost, actual equity shall be considered for determination of tariff:

ii. the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment:

iii. any grant obtained for the execution of the project shall not be considered as a part of capital structure for the purpose of debt: equity ratio.

Explanation.-The premium, if any, raised by the generating company or the transmission licensee, as the case may be, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, only if such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station or the transmission system.

(2)The generating company or the transmission licensee, as the case may be, shall submit the resolution of the Board of the company or approval of the competent authority in other cases regarding infusion of funds from internal resources in support of the utilization made or proposed to be made to meet the capital expenditure of the generating station or the transmission system including communication system, as the case may be.

(3) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2019, debt: equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2019 shall be considered:

Provided that in case of generating station or a transmission system including communication system which has completed its useful life as on or after 1.4.2019, if the equity actually deployed as on 1.4.2019 is more than 30% of the capital cost, equity in excess of 30% shall not be taken into account for tariff computation;

Provided further that in case of projects owned by Damodar Valley Corporation, the debt: equity ratio shall be governed as per sub-clause (ii) of clause (2) of Regulation 72 of these regulations.

(4) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2019, but where debt: equity ratio has not been determined by the Commission for determination of tariff for the period ending 31.3.2019, the Commission shall approve the debt: equity ratio in accordance with clause (1) of this Regulation.

(5) Any expenditure incurred or projected to be incurred on or after 1.4.2019 as may be admitted by the Commission as additional capital expenditure for determination of tariff, and renovation and modernization expenditure for life extension shall be serviced in the manner specified in clause (1) of this Regulation.

55. The gross normative loan and equity of the generating station, as on 31.3.2019 as approved by order dated 4.8.2022 in Petition 192/GT/2020 is Rs.196730.97 lakh and 80046.80 lakh respectively, which has been retained as on 1.4.2019. Further the projected additional capital expenditure approved as above, has been allocated in the debt to equity of 70:30. Accordingly the debt: equity ratio is worked out as under:

	Capital cost as on 1.4.2019 ***(Rs. in lakh)***	**(%)**	**Additional capital expenditure** ***(Rs. in lakh)***	**(%)**	**Total cost as on 31.3.2024** ***(Rs. in lakh)***	**(%)**
Debt	196730.97	71.08%	706.67	70.00%	197437.64	71.08%
Equity	80,046.80	28.92%	302.86	30.00%	80349.66	28.92%
Total	276777.77	100.00%	1009.54	100.00%	277787.31	100.00%

Return on Equity

56. Regulation 30 of the 2019 Tariff Regulations provides as under:

"30. Return on Equity:

(1) Return on equity shall be computed in rupee terms on the equity base determined in accordance with Regulation 18 of these regulations.

(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 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 return on equity in respect of additional capitalization after cut-off date beyond the original scope excluding additional capitalization due to Change in Law shall *be computed at the weighted average rate of interest on actual loan portfolio of the generating station or the transmission system;*

Provided further that:

(i) In case of a new project the rate of return on equity shall be reduced by 1.00% 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) or Free Governor Mode Operation (FGMO) data telemetry communication system up to load dispatch centre or protection system based on the report submitted by the respective RLDC;

(ii) in case of existing generating station as and when any of the requirements under (i) above of this Regulation are found lacking based on the report submitted by the concerned RLDC rate of return on equity shall be reduced by 1.00% for the period for which the deficiency continues;

(iii) in case of a thermal generating station with effect from 1.4.2020:

(a) rate of return on equity shall be reduced by 0.25% in case of failure to achieve the ramp rate of 1% per minute;

(b) an additional rate of return on equity of 0.25% shall be allowed for every incremental ramp rate of 1% per minute achieved over and above the ramp rate of 1% per minute subject to ceiling of additional rate of return on equity of 1.00%:

Provided that the detailed guidelines in this regard shall be issued by National Load Dispatch Centre by 30.6.2019.

57. Regulation 31 of the 2019 Tariff Regulations provides as under:

"31. Tax on Return on Equity:

(1) The base rate of return on equity as allowed by the Commission under Regulation 30 of these regulations 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 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 paid on income from other businesses including deferred tax liability (i.e., income from business other than business of generation or transmission as the case may be) shall be excluded 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.

Illustration-

(i) In case of the generating company or the transmission licensee paying Minimum Alternate Tax (MAT) @ 21.55% including surcharge and cess:

Rate of return on equity = 15.50/(1-0.2155) = 19.758%

(ii) In case of a generating company or the transmission licensee paying normal corporate tax including surcharge and cess:

(a) Estimated Gross Income from generation or transmission business for FY 2019-20 is Rs 1000 crore.

(b) Estimated Advance Tax for the year on above is Rs 240 crore.

(c) Effective Tax Rate for the year 2019-20 = Rs 240 Crore/Rs 1000 Crore = 24%.

(d) Rate of return on equity = 15.50/ (1-0.24) = 20.395%.

(3) The generating company or the transmission licensee as the case may 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 2019-24 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 as the case may be on year to year basis."

58. The Petitioner has claimed Return on Equity (ROE) considering base rate of 15.50% and effective tax rate of 17.472% for the opening equity as on 1.4.2019 and projected additional capital expenditure claimed under original scope of work, change in law etc. for the 2019-24 tariff period. The same has been considered for the purpose of tariff.

59. The Petitioner has further claimed ROE on the additional capital expenditure beyond the original scope of work (except due to change in law) at the weighted average rate of interest of each year for the 2019-24 tariff period, in line with the second proviso to Regulation 30 of 2019 Tariff Regulation. Regulation 30(1) of the 2019 Tariff Regulations provides for computation of ROE, on the equity base, as determined in accordance with Regulation 18 of the 2019 Tariff Regulations. While clause (1) of Regulation 18 provides for the determination of the debt-equity ratio for new projects, clauses (3) and (4) of the said Regulation provides for consideration/ determination of the debt-equity ratio in respect of the generating stations declared under commercial operation prior to 1.4.2019. Further, clause (5) of the said regulation provides that the admitted additional capital

expenditure incurred or projected to be incurred on or after 1.4.2019, is to be serviced in the manner specified in clause (1) of Regulation 18 of the 2019 Tariff Regulations. On the same analogy, Regulation 30(2) of the 2019 Tariff Regulations provides for the computation of ROE at the base rate of 15.50% (for thermal generating stations) while the proviso to Regulation 30(2) provides for computation of ROE in respect of additional capitalization after cut-off date, beyond the original scope, excluding additional capitalization due to change in law, at the weighted average rate of interest on actual loan portfolio of the generating station. It is however noticed that as per clause (1) of Regulations 31 of the 2019 Tariff Regulations (Tax on ROE), the base rate of return on equity, as allowed by the Commission under Regulation 30 of the said regulations, is required to be grossed up with the effective tax rate of the respective financial year. Thus, we are of the view, that on a harmonious construction of the provisions of Regulation 18 read with Regulation 30 and 31 of the 2019 Tariff Regulations, the ROE computed at the predetermined base rate of 15.50% and ROE computed at the weighted average rate of interest (WAROI) are required to be grossed up with the effective tax rate of the respective financial year. Accordingly, ROE has been worked out and allowed as under:

Return on Equity at Normal Rate:

(*Rs. *in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Notional Equity- Opening (A)	80046.80	80154.50	80240.16	80240.16	80296.52
Addition of Equity due to additional capital expenditure (B)	115.27	85.66	0.00	56.36	0.00
Normative Equity – Closing (C) = (A+B)	**80162.07**	**80247.73**	**80247.73**	**80304.09**	**80304.09**
Average Normative Equity (D) = (A+C)/2	80104.44	80204.90	80247.73	80275.91	80304.09
Return on Equity (Base Rate) (E)	15.500%	15.500%	15.500%	15.500%	15.500%
Effective Tax Rate (F)	17.4720%	17.472%	17.472%	17.472%	17.472%
Rate of Return on Equity (Pre-tax) (G) = (E)/(1-F)	18.782%	18.782%	18.782%	18.782%	18.782%
Return on Equity (Pre-tax) - (annualized) (H) = (DxG)	**15045.22**	**15064.08**	**15072.13**	**15077.42**	**15082.71**

Return on Equity at WAROI

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Notional Equity- Opening (A)	0.00	0.00	22.59	45.57	45.57
Addition of Equity due to additional capital expenditure (B)	0.00	22.59	22.98	0.00	0.00
Normative Equity – Closing (C) = (A+B)	0.00	22.59	45.57	45.57	45.57
Average Normative Equity (D) = (A+C)/2	0.00	11.30	34.08	45.57	45.57
Return on Equity (Base Rate) (E)	8.2396%	8.2396%	8.2396%	8.2396%	8.2396%
Effective Tax Rate (F)	17.472%	17.472%	17.472%	17.472%	17.472%
Rate of Return on Equity (Pre-tax) (G) = (E)/(1-F)	9.984%	9.984%	9.984%	9.984%	9.984%
Return on Equity (Pre-tax) - (annualized) (H) = (DxG)	**0.00**	**1.13**	**3.40**	**4.55**	**4.55**

Interest on loan

60. Regulation32 of the 2019 Tariff Regulations provides as under:

"32. Interest on loan capital: (1) The loans arrived at in the manner indicated in Regulation 18of these regulations shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2019 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2019 from the gross normative loan.

(3) The repayment for each of the year of the tariff period 2019-24 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-capitalization 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 changes to the terms and conditions of the loan shall be reflected from the date of such re-financing."

61. The Petitioner has claimed tariff considering WAROI of 8.2396% for the entire 2019-24 tariff period, based on the actual WAROI of 2018-19, and has submitted that the WAROI, shall be claimed at actuals, at the time of truing-up of tariff. Interest on loan has been worked out as under:

i) The gross normative loan amounting to Rs.196730.97 lakh has been considered as on 1.4.2019;

ii) Cumulative repayment of Rs.132306.11 lakh as on 31.3.2019 as considered in order dated 4.8.2022 in Petition No. 192/GT/2020 has been considered as on 1.4.2019.

iii) Accordingly, the net normative opening loan as on 1.4.2019 works out to Rs.64424.86 lakh;

iv) Addition to normative loan on account of additional capital expenditure approved above has been considered;

v) Depreciation allowed has been considered as repayment of normative loan during the respective year of the 2019-24 tariff period. Further, repayments have been adjusted for de-capitalization of assets considered for the purpose of tariff;

vi) The weighted average rate of interest has been considered as 8.2396% as claimed by the Petitioner which is subject to true up;

62. Necessary calculation of interest of loan is as under:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Gross opening loan (A)	196730.97	196982.27	197234.85	197288.47	197419.98
Cumulative repayment of loan upto previous year / period (B)	132306.11	146040.19	159733.9	173496.66	179603.52
Net Loan Opening (C) = (A-B)	64424.86	50942.08	37500.95	23791.81	17816.46
Addition on account of additional capital expenditure (D)	268.97	252.58	53.62	131.51	0.00
Repayment of loan during the year (E)	13734.70	13753.17	13764.02	6213.25	6230.00
Less: Repayment adjustment on account of de-capitalization (F)	0.00	58.22	0.00	104.81	0.00

Net Repayment (G) = (E-F)	13734.70	13694.96	13764.02	6108.45	6230.00
Net Loan Closing (H) = (C+D-G)	50959.13	37516.74	23806.34	17829.41	11599.41
Average Loan (I) = (C+H)/2	57691.99	44237.94	30661.54	20817.88	14714.41
Weighted Average Rate of Interest on Loan (J)	8.2396%	8.2396%	8.2396%	8.2396%	8.2396%
Interest on Loan (K) = (IxJ)	**4753.58**	**3645.02**	**2526.39**	**1715.31**	**1212.41**

Depreciation

63. Regulation 33 of the 2019 Tariff Regulations provides as under:

"33. Depreciation: (1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system or element thereof including communication system. 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:

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 a 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 the salvage value for IT equipment and software shall be considered as NIL and 100% value of the assets shall be considered depreciable;

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

Provided also 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 unit or transmission system as the case may be, shall not be allowed to be recovered at a later stage during the useful life or 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-I 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 1.4.2019 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2019 from the gross depreciable value of the assets.

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

(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."

64. The cumulative depreciation amounting to Rs. 132306.11 lakh as on 31.3.2019 as considered in order dated 4.8.2022 in Petition No. 192/GT/2020, has been considered as on 1.4.2019. The value of freehold land has been considered as nil. Accordingly, the balance depreciable value, before providing depreciation for the year 2019-20, works out to Rs.116997.37 lakh. As on 1.4.2019, the used life of the generating station i.e., 9.69 years is less than 12 years from the effective station COD of 22.7.2009. Accordingly, depreciation has been calculated by applying the weighted average rate of depreciation for the period from 2019-20 to 2021-22 and thereafter, depreciation has been calculated by spreading over the balance depreciable value over the balance life of the generating station. The Petitioner has considered WAROD as 5.13%, which is same as those claimed by the Petitioner in 2018-19 in Petition 192/GT/2020. However, it is observed that the Commission in its order dated 4.8.2022 in Petition 192/GT/2020 had approved the depreciation rate of 4.9589% for 2018-19. Accordingly, the same has been considered for the calculation of depreciation. Further, the value of IT assets has been considered as

submitted by the Petitioner. Necessary calculations in support of depreciation are as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Average Capital Cost (A)	276969.89	277342.42	277561.13	277693.37	277787.31
Value of freehold land included above (B)	0.00	0.00	0.00	0.00	0.00
Value of IT assets (C)	419.26	419.26	419.26	419.26	419.26
Aggregated depreciable value (D) = (A-B-C)x90%+C	249314.83	249650.11	249846.95	249965.96	250050.50
Remaining aggregate depreciable value at the beginning of the year (E) =(D-cumulative depreciation at 'J' at the end of previous s. year)	117008.73	103609.30	90111.19	76466.18	70442.27
No. of completed years at the beginning of the year (F)	9.69	10.69	11.69	12.69	13.69
Balance useful life at the beginning of the year (G)	15.31	14.31	13.31	12.31	11.31
Weighted Average Rate of Depreciation (WAROD) (H)	4.9589%	4.9589%	4.9589%	---	---
Depreciation during the year (I)	13734.70	13753.17	13764.02	6213.25	6230.00
Cumulative Depreciation at the end of the year (before adjustment for de-capitalization) (J) = (cumulative depreciation at 'J' at the end of previous. year + I)	146040.80	159793.98	173499.78	179713.04	185838.23
Less: Depreciation adjustment on account of de-capitalization (K)	0.00	58.22	0.00	104.81	0.00
Cumulative depreciation at the end of the year (L) = (J-K)	**146040.80**	**159735.76**	**173499.78**	**179608.23**	**185838.23**

**Cumulative Depreciation as on 31.3.2019 is Rs. 132306.11 lakh*

O&M Expenses

65. The O&M expenses claimed by the Petitioner are as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
O&M expenses under Regulation 35(1)(1) of the 2019 Tariff Regulations	16480.00	17060.00	17655.00	18280.00	18920.00

O&M expenses under Regulation 35(6) of the 2019 Tariff Regulations:					
- Water Charges (Net)	1293.16	1293.16	1293.16	1293.16	1293.16
- Capital Spares consumed	0.00	0.00	0.00	0.00	0.00
-Security Expenses	2054.87	2260.36	2486.39	2735.03	3008.54
O&M expenses under Regulation 35(3) of the 2019 Tariff Regulations:					
- O&M expenses for 7 no. of bays	225.05	232.96	241.15	249.62	258.37
- O&M expenses for 13.794 Km double ckt line for associated transmission line	12.15	12.58	13.02	13.48	13.95
- O&M expenses for 6 no. of transformers	511.38	529.96	548.54	568.48	587.16
Total O&M Expenses	**20576.61**	**21389.02**	**22237.27**	**23139.77**	**24081.17**

66. The normative O&M expenses claimed by the Petitioner, in terms of the Regulation 35(1)(1) of the 2019 Tariff Regulation, is in order and is therefore allowed. However, in the O&M expenses claimed under Regulation 35(3) of the 2019 Tariff Regulations, it has been observed that the Petitioner has included O&M expenses towards Generator Transformer (2 Nos.), Inter-connecting Transformer (2 Nos.), Unit Auxiliary Transformer (2 Nos.) and Station Transformer (2 Nos.) while claiming the O&M expenses for the associated transmission facilities. The Commission is of the view that the O&M expenses towards these transformers had already been covered under the normative O&M expenses of the generating station under Regulation 35(1)(1) of the 2019 Tariff Regulations and therefore the claim for transformers under Regulation 35(3) of the 2019 Tariff Regulations is not allowed. However, the O&M expenses for 7 no. of 400 kV bays and 13.794 Ckt Km claimed under Regulation 35(3) of 2019 Tariff Regulations have only been allowed.

Water Charges

67. The first proviso to Regulation 35(6) of the 2019 Tariff Regulations provides for the claim for Water charges as under:

> *"35(6) The Water Charges, Security Expenses and Capital Spares for thermal generating stations shall be allowed separately after prudence check: Provided that water charges shall be allowed based on water consumption depending upon type of plant and type of cooling water system, subject to prudence check. The details regarding the same shall be furnished along with the petition;*
>
> *xxxxxxxx."*

68. The actual water charges claimed by the Petitioner in Petition 192/GT/2020 for the 2014-19 tariff period and allowed by order dated 4.8.2022 are as under:

(Rs. in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Water Charges Claimed	1275.02	1293.16	1293.16	1393.16	1293.16
Water Charges allowed	1275.02	1293.16	1293.16	1393.16	1293.16

69. The water charges allowed, on projected basis, by order dated 4.8.2022 in Petition No. 192/GT/2020 are as under:

(Rs. in lakh)

	2014-15	**2015-16**	**2016-17**	**2017-18**	**2018-19**
Actual Water charges	1855.02	1873.16	1873.16	1873.16	1873.16
Less: Adjustment of water charges towards advance for Mohad reservoir	580.00	580.00	580.00	580.00	580.00
Net water charges allowed	1275.02	1293.16	1293.16	1393.16	1293.16

70. In terms of the first proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations, Water charges shall be allowed separately based on the water consumption depending upon the type of plant, type of cooling water system etc., subject to prudence check. The details in respect of water charges for the 2019-24 tariff period as furnished by the Petitioner are as under:

Description	**Remarks**
Type of Plant	Coal Based Power Plant
Type of cooling water system	Closed Circuit Cooling System
Yearly allocation of water	16990107.96 cubic meters
Consumption of water	15291097 cubic meters

Rate of water charges*	Rs.12.25/Cubic Meter
Total water charges*	Rs.1873.16 lakh

** As per truing up petition filed for the instant station for 2018-19*

71. For the 2019-24 tariff period, the Petitioner has claimed water charges, on the basis of the actual water charges claimed for 2018-19 without any escalation.

72. The Respondent CSPDCL has submitted that the Petitioner has indicated only the amount of water consumed, and not the power generated by the Petitioner. It has also submitted that as per MOEF &CC Notification dated 7.12.2015, the Thermal power plants installed before 1st January 2017, must meet specific water consumption up to Maximum of 3.5 m3/Mwh. Accordingly, the Respondent has submitted that the water charges may be allowed only after prudence check. The Petitioner has however, clarified that the claim is within the norms prescribed in the said notification. Further, the Petitioner has submitted that it has claimed water charges as per the agreement entered into between Water Resource Department, Chhattisgarh and NSPCL. As per the said agreement, the Petitioner is liable to pay water charges for at least 90% of allocation. The Petitioner has also submitted that the water charges have been claimed on the same basis, as approved for 2014-19 tariff period.

73. We have examined the matter. It has been observed that the water charges claimed in the present Petition are based on the actual water charges paid in 2018-19, based on the audited accounts of 2018-19. The same was approved by order dated 4.8.2022 in Petition 192/GT/2020. In view of the above, the water charges claimed by the Petitioner, on projection basis, for the 2019-24 tariff period is allowed. However, the petitioner is directed to review the contracted water as per actual requirement. Accordingly, the water charges allowed is as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Water charges claimed	1293.16	1293.16	1293.16	1293.16	1293.16
Water charges allowed	1293.16	1293.16	1293.16	1293.16	1293.16

74. However, the Petitioner is directed to submit the current status of Rs. 110 crore as advance paid to water department shown under the head "part of loans and advances" in Petition 308/GT/2009 at the time of truing up of 2019-24 tariff period.

Security Expenses

75. The second proviso to Regulation 35(6) of the 2019 Tariff Regulations provides for the claim for Security expenses as under:

> *"35(6) The Water Charges, Security Expenses and Capital Spares for thermal generating stations shall be allowed separately after prudence check:*
> *xxxx;*
> *Provided further that the generating station shall submit the assessment of the security requirement and estimated expenses;*
> *xxxx"*

76. The security expenses claimed by the Petitioner is as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
2054.87	2260.36	2486.39	2735.03	3008.54

77. The Petitioner has submitted that the security expenses has been claimed, based on the estimated expenses for 2019-24 tariff period and shall be subject to adjustment, based on actuals, at the time of truing up of tariff.

78. We have examined the matter. The Petitioner has claimed projected security expenses for the 2019-24 tariff period, but has not furnished the assessment of security requirement, as required, under the provisions of the 2019 Tariff Regulations. Accordingly, the Petitioner is directed to furnish the requisite details for carrying out the prudence check of the security expenses, at the time of truing up of tariff. With regards to

the present claim of the Petitioner, it has been observed that the Petitioner has claimed security expenses by applying an escalation factor of 10% for each year of the 2019-24 tariff period. However, the Petitioner has not submitted any justification for the security expenses claimed for base year i.e., 2019-20. Further, it has been observed that the Petitioner, in Petition 192/GT/2020, had submitted the actual O&M expenses for the 2014-19 tariff period vide affidavit dated 16.7.2021, wherein the actual security expenses incurred for 2018-19 is stated to be Rs.1663.67 lakh. Thus, the security expenses claimed by the Petitioner for 2019-20 i.e., Rs. 2054.87 lakh is around 24% higher than the actual expenses for 2018-19. In our view, the escalation of 24% is not justified. Accordingly, the Commission has considered an escalation of 10% on the actual security expenses of 2018-19 submitted by the Petitioner vide affidavit dated 16.7.2021 in Petition 192/GT/2020 to arrive at the security expenses for 2019-20 and an escalation of 10% has been considered for each year of the 2019-24 tariff period. Accordingly, the security expenses claimed and allowed, for the generating station for the 2019-24 tariff period is as under:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Security expenses claimed	2054.87	2260.36	2486.39	2735.03	3008.54
Security expenses allowed	1830.04	2013.04	2214.34	2435.78	2679.36

Capital Spares

79. The Petitioner has not claimed any capital spares of the 2019-24 tariff period, but has submitted that the same shall be claimed on actual consumption of spares at the time of truing up, in terms of proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations. Accordingly, the same has not been considered in this order. The claim of the Petitioner if any, towards capital spares, at the time of truing up, shall be considered on merits, after prudence check.

80. Accordingly, the total O&M expenses allowed to the generating station for the 2019-24 tariff period is as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Normative O&M expenses claimed under Regulation 35(1)(1) of the 2019 Tariff Regulations **(a)**	16480.00	17060.00	17655.00	18280.00	18920.00
Normative O&M expenses allowed under Regulation 35(1)(1) of the 2019 Tariff Regulations **(a)**	16480.00	17060.00	17655.00	18280.00	18920.00
Normative O&M expenses claimed under Regulation 35(3) of the 2019 Tariff Regulations: **(c)**	748.58	775.50	802.71	831.58	859.48
Normative O&M expenses allowed under Regulation 35(3) of the 2019 Tariff Regulations **(d)**	237.20	245.54	254.17	263.10	272.32
Water Charges (Net) claimed under Regulation 35(6) of the 2019 Tariff Regulations **(e)**	1293.16	1293.16	1293.16	1293.16	1293.16
Water Charges (Net) allowed under Regulation 35(6) of the 2019 Tariff Regulations (**f**)	1293.16	1293.16	1293.16	1293.16	1293.16
Security Expenses claimed under Regulation 35(6) of the 2019 Tariff Regulations **(g)**	2054.87	2260.36	2486.39	2735.03	3008.54
Security Expenses allowed under Regulation 35(6) of the 2019 Tariff Regulations **(h)**	1830.04	2013.04	2214.34	2435.78	2679.36
Total O&M expenses claimed under Regulation 29 of the 2014 Tariff Regulations (a + c + e + g + i)	20576.61	21389.02	22237.26	23139.77	24081.18
Total O&M expenses allowed under Regulation 29 of the 2014 Tariff Regulations (b + d + f + h + j)	**19840.40**	**20611.74**	**21416.68**	**22272.04**	**23164.83**

Operational Norms

81. The operational norms in respect of the generating station i.e. normative annual plant availability factor**,** gross station heat rate, specific fuel oil consumption and auxiliary power consumption are discussed as under:

Normative Annual Plant Availability Factor

82. Regulation 49(A) of the 2019 Tariff Regulations provides as under:

"(A) Normative Annual Plant Availability Factor (NAPAF)

(a) For all thermal generating stations, except those covered under clauses (b), (c), (d), & (e) - 85%;

xxx."

83. In terms of Regulation 49(A)(a) of the 2019 Tariff Regulations, the Petitioner has considered Normative Annual Plant Availability Factor of 85% during the 2019-24 tariff period, the same is allowed.

Gross Station Heat Rate (kCal/kWh)

84. Regulation 49(C)(b)(i) of 2019 Tariff Regulations provides as under:

"(i) For Coal-based and lignite-fired Thermal Generating Stations:

1.05 X Design Heat Rate (kCal/kWh)

Where the Design Heat Rate of a generating unit means the unit heat rate guaranteed by the supplier at conditions of 100% MCR, zero percent make up, design coal and design cooling water temperature/back pressure.

Provided that the design heat rate shall not exceed the following maximum design unit heat rates depending upon the pressure and temperature ratings of the units:

Pressure Rating (Kg/cm2)	150	170	170
SHT/RHT (^{0}C)	535/535	537/537	537/565
Type of BFP	Electrical Driven	Turbine Driven	Turbine Driven
Max Turbine Heat Rate (kCal/kWh)	1955	1950	1935
Min. Boiler Efficiency			
Sub-Bituminous Indian Coal	0.86	0.86	0.86
Bituminous Imported Coal	0.89	0.89	0.89
Max. Design Heat Rate (kCal/kWh)			
Sub-Bituminous Indian Coal	2273	2267	2250
Bituminous Imported Coal	2197	2191	2174

Pressure Rating (Kg/cm2)	247	247	270	270
SHT/RHT (^{0}C)	537/565	565/593	593/593	600/600
Type of BFP	Turbine Driven	Turbine Driven	Turbine Driven	Turbine Driven
Max Turbine Heat Rate (kCal/kWh)	1900	1850	1810	1800
Min. Boiler Efficiency				
Sub-Bituminous Indian Coal	0.86	0.86	0.865	0.865
Bituminous Imported Coal	0.89	0.89	0.895	0.895
Max. Design Heat Rate (kCal/kWh)				
Sub-Bituminous Indian Coal	2222	2151	2105	2081
Bituminous Imported Coal	2135	2078	2034	2022

Provided further that in case pressure and temperature parameters of a unit are different from above ratings, the maximum design heat rate of the unit of the nearest class shall be taken:

Provided also that where heat rate of the unit has not been guaranteed but turbine cycle heat rate and boiler efficiency are guaranteed separately by the same supplier or different suppliers, the design heat rate of the unit shall be arrived at by using guaranteed turbine cycle heat rate and boiler efficiency:

Provided also that where the boiler efficiency is lower than 86% for Subbituminous Indian coal and 89% for bituminous imported coal, the same shall be considered as 86% and 89% for Sub-bituminous Indian coal and bituminous imported coal respectively, for computation of station heat rate:

Provided also that maximum turbine cycle heat rate shall be adjusted for type of dry cooling system:

Provided also that in case of coal based generating station if one or more generating units were declared under commercial operation prior to 1.4.2019, the heat rate norms for those generating units as well as generating units declared under commercial operation on or after 1.4.2019 shall be lowest of the heat rate norms considered by the Commission during tariff period 2014-19 or those arrived at by above methodology or the norms as per the sub-clause (C)(a)(i) of this Regulation:

Provided also that in case of lignite-fired generating stations (including stations based on CFBC technology), maximum design heat rates shall be increased using factor for moisture content given in sub-clause (C)(a)(iv) of this Regulation:

Provided also that for Generating stations based on coal rejects, the Commission shall approve the Station Heat Rate on case to case basis.

Note: In respect of generating units where the boiler feed pumps are electrically operated, the maximum design heat rate of the unit shall be 40 kCal/kWh lower than the maximum design heat rate of the unit specified above with turbine driven Boiler Feed Pump."

85. The Petitioner has considered the Gross Station Heat Rate (GSHR) of 2415 kcal/kWh for the 2019-24 tariff period. It is observed that the Commission in its order 2.8.2016 in Petition 257/GT/2014, had considered the design heat rate of 2300 kcal/kWh. Accordingly, considering the normative deviation of 5% in terms of the provisions of the 2019 Tariff Regulations, the Gross Station Heat Rate (GSHR) works out as 2415 kcal/kWh. The Petitioner has also claimed the Normative Station Heat Rate of 2415 kcal/kWh, which is in line with the provisions of the 2019 Tariff Regulations and hence allowed.

Secondary Fuel Oil Consumption

86. Regulation 49(D)(a) of 2019 Tariff Regulations provides as under:

"(a) For Coal-based generating stations other than at (c) below: 0.50 ml/kWh"

87. In terms of Regulation 49(D)(a) of the 2019 Tariff Regulations, the Petitioner has considered the secondary fuel oil consumption of 0.50 ml/kWh during the 2019-24 tariff period and the same is allowed.

Auxiliary Power Consumption

88. Regulation 49(E)(a) of 2019 Tariff Regulations provides as under:

"(a) For Coal-based generating stations except at (b) below:

S. No.	*Generating Station*	*With Natural Draft cooling tower or without cooling tower*
(i)	*200 MW series*	*8.50%*
(ii)	*300 MW and above*	
	Steam driven boiler feed pumps	*5.75%*
	Electrically driven boiler feed pumps	*8.00%*

Provided that for thermal generating stations with induced draft cooling towers and where tube type coal mill is used, the norms shall be further increased by 0.5% and 0.8%, respectively:

Provided further that Additional Auxiliary Energy Consumption as follows shall be allowed for plants with Dry Cooling Systems:

Type of Dry Cooling System	***(% of gross generation)***
Direct cooling air cooled condensers with mechanical draft fans	*1.0%*
Indirect cooling system employing jet condensers with pressure recovery turbine and natural draft tower	*0.5%*

Note: The auxiliary energy consumption for the unit capacity of less than 200 MW sets shall be dealt on case-to-case basis."

89. In terms of Regulation 49(E)(a) of the 2019 Tariff Regulations, the Petitioner has considered the Auxiliary Energy Consumption of 9.00% (8.5% for 200 MW series generating stations plus 0.5% for IDCT) during the 2019-24 tariff period and the same is allowed.

Interest on Working Capital

90. Sub-section (a) of clause (1) of Regulation 34 of the 2019 Tariff Regulations provides as under:

"34. Interest on Working Capital: (1) The working capital shall cover:

(a) For Coal-based/lignite-fired thermal generating stations:

(i) Cost of coal or lignite and limestone towards stock if applicable for 10 days for pit-head generating stations and 20 days for non-pit-head generating stations for generation corresponding to the normative annual plant availability factor or the maximum coal/lignite stock storage capacity whichever is lower;

(ii) Advance payment for 30 days towards cost of coal or lignite and limestone for generation corresponding to the normative annual plant availability factor;

(iii) Cost of secondary fuel oil for two months for generation corresponding to the normative annual plant availability factor and in case of use of more than one secondary fuel oil cost of fuel oil stock for the main secondary fuel oil;

(iv) Maintenance spares @ 20% of operation and maintenance expenses including water charges and security expenses;

(v) Receivables equivalent to 45 days of capacity charge and energy charge for sale of electricity calculated on the normative annual plant availability factor; and

(vi) Operation and maintenance expenses including water charges and security expenses for one month.

(b) ***For Open-cycle Gas Turbine/Combined Cycle thermal generating stations****:*

(i) Fuel cost for 30 days corresponding to the normative annual plant availability factor duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;

(ii) Liquid fuel stock for 15 days corresponding to the normative annual plant availability factor and in case of use of more than one liquid fuel cost of main liquid fuel duly taking into account mode of operation of the generating stations of gas fuel and liquid fuel;

(iii) Maintenance spares @ 30% of operation and maintenance expenses including water charges and security expenses;

(iv) Receivables equivalent to 45 days of capacity charge and energy charge for sale of electricity calculated on normative plant availability factor duly taking Order in Petition No. 410/GT/2020 Page 32 of 37 into account mode of operation of the generating station on gas fuel and liquid fuel; and

(v) Operation and maintenance expenses including water charges and security expenses for one month.

(c) For Hydro generating station (including Pumped Storage Hydro Generating Station) and transmission system:

(i) Receivables equivalent to 45 days of annual fixed cost;

(ii) Maintenance spares @ 15% of operation and maintenance expenses including security expenses; and

(iii) Operation and maintenance expenses including security expenses for one month.

(2) The cost of fuel in cases covered under sub-clauses (a) and (b) of clause (1) of this Regulation shall be based on the landed fuel cost (taking into account normative transit and handling losses in terms of Regulation 39 of these regulations) by the generating station and gross calorific value of the fuel as per actual weighted average for the third quarter of preceding financial year in case of each financial year for which tariff is to be determined:

Provided that in case of new generating station the cost of fuel for the first financial year shall be considered based on landed fuel cost (taking into account normative transit and handling losses in terms of Regulation 39 of these regulations) and gross *calorific value of the fuel as per actual weighted average for three months as used for infirm power preceding date of commercial operation for which tariff is to be determined.*

(3) Rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2019 or as on 1st April of the year during the tariff period 2019-24 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.

Provided that in case of truing-up the rate of interest on working capital shall be considered at bank rate as on 1st April of each of the financial year during the tariff period 2019-24.

(4) Interest on working capital shall be payable on normative basis notwithstanding that the generating company or the transmission licensee has not taken loan for working capital from any outside agency."

Fuel Cost and Energy Charges in Working Capital

91. Regulation 34(2) of the 2019 Tariff Regulations provides that the computation of cost of fuel as part of Interest on Working Capital (IWC) is to be based on the landed price and GCV of fuel as per actuals, for the third quarter of preceding financial year in case of each financial year for which tariff is to be determined.

92. Regulation 43(2) of the 2019 Tariff Regulations provides as under:

"(2) Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis shall be determined to three decimal places in accordance with the following formulae:

***(a) For coal based and lignite fired stations**:*

ECR = {(SHR – SFC x CVSF) x LPPF / CVPF + SFC x LPSFi + LC x LPL} x 100 / (100 – AUX)

***(b) For gas and liquid fuel based stations**:*

ECR = SHR x LPPF x 100 / {(CVPF) x (100 – AUX)}

Where,

AUX = Normative auxiliary energy consumption in percentage.

CVPF = (a) Weighted Average Gross calorific value of coal as received, in kCal per kg for coal based stations less 85 Kcal/Kg on account of variation during storage at generating station;

(b) Weighted Average Gross calorific value of primary fuel as received, in kCal per kg, per litre or per standard cubic meter, as applicable for lignite, gas and liquid fuel based stations;

(c) In case of blending of fuel from different sources, the weighted average Gross calorific value of primary fuel shall be arrived in proportion to blending ratio:

CVSF = Calorific value of secondary fuel, in kCal per ml;

ECR = Energy charge rate, in Rupees per kWh sent out;

SHR = Gross station heat rate, in kCal per kWh;

LC = Normative limestone consumption in kg per kWh;

LPL = Weighted average landed cost of limestone in Rupees per kg;

LPPF = Weighted average landed fuel cost of primary fuel, in Rupees per kg, per litre or per standard cubic metre, as applicable, during the month. (In case of blending of fuel from different sources, the weighted average landed fuel cost of primary fuel shall be arrived in proportion to blending ratio);

SFC= Normative specific fuel oil consumption, in ml per kWh;

LPSFi= Weighted Average Landed Fuel Cost of Secondary Fuel in Rs./ ml during the month:

Provided that energy charge rate for a gas or liquid fuel based station shall be adjusted for open cycle operation based on certification of Member Secretary of respective Regional Power Committee during the month."

93. The Petitioner has claimed the cost of fuel component in working capital and Energy Charge Rate (ECR) based on followings:

(a) Operational norms as per the 2019 Tariff Regulations;

(b) Price and 'as received GCV of coal (after reducing the same by 85 kCal/kWh in terms of above quoted Regulation) procured for the three months of October 2018, November 2018 and December 2018;

(c) Price and GCV of secondary fuel oil for the three months of October 2018, November 2018 and December 2018.

94. Accordingly, the Petitioner has claimed the ECR of Rs.2.347 per kWh and the following fuel cost components in working capital for the 2019-24 tariff period:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Cost of Coal (50 days (generation corresponding to NAPAF)	10797.84	10797.84	10797.84	10797.84	10797.84
Cost of secondary fuel oil (2 months generation corresponding to NAPAF)	114.97	114.66	114.66	114.66	114.97

95. On perusal of the Form-15 furnished by the Petitioner vide affidavit dated 29.6.2021, it is observed that the Petitioner has included opening stock of coal and its corresponding value while computing weighted average price of coal for the month of October 2018, November 2018 and December 2018. However, in terms of Regulation 34(2) of the 2019 Tariff Regulations the computation of cost of fuel as part of IWC is to

be based on the landed price and GCV of fuel as per actuals, which means that only fuel received during these three months is only to be considered and no opening stock shall be included therein. Accordingly, the opening stock of coal and its corresponding values have been excluded while computing the weighted average price and GCV of coal. Based on the above the weighted average price and GCV of coal and oil claimed and allowed for the 2019-24 tariff period, subject to truing up is as under:

	Claimed	**Allowed**
Weighted average price of coal (Rs. /MT)	2915.28	2901.40
Weighted average GCV of Coal (kcal/kg)	3318.49	3317.99
Weighted average price of oil (Rs. /KL)	36957.30	36928.98
Weighted average GCV of oil (kcal/KL)	9883.67	9884.07

** The change in claimed GCV and price as compared to allowed GCV and price is due to reason that Petitioner has considered simple average whereas weighted average has been considered for the purpose of tariff in line with the provisions of the 2019 Tariff Regulations.*

96. Accordingly, the fuel component in working capital, Energy Charges and ECR claimed and allowed for the 2019-24 tariff period are as under:

	Claimed		**Allowed**	
	2019-20 & 2023-24	**2020-21 to 2022-23**	**2019-20 & 2023-24**	**2020-21 to 2022-23**
Cost of coal for 50 days of generation corresponding to NAPAF	10797.84		10748.05	
Cost of secondary fuel oil for 2 months of generation corresponding to NAPAF	114.97	114.66	114.89	114.57
ECR (Rs. /kWh)	2.347		2.336	

97. The Petitioner, on a month-to-month basis, shall compute and claim the energy charges from the beneficiaries based on formulae given under Regulation 43 of the 2019 Tariff Regulations.

Working Capital for Maintenance Spares

98. The Petitioner in has claimed maintenance spares in working capital as under:

(Rs. in lakh)

2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
4115.32	4156.03	4447.45	4627.95	4816.23

99. Regulation 34(1)(a)(iv) of the 2019 Tariff Regulations provide for maintenance spares @ 20% of the O&M expenses (including water charges and security expenses). Accordingly, maintenance spares @ 20% of the O&M expenses (including the water charges and security expenses) allowed for the 2019-24 tariff period is as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
3968.08	4122.35	4283.34	4454.41	4632.97

Working Capital for Receivables

100. In terms of Regulation 34(1)(a)(v) of the 2019 Tariff Regulations, the receivables equivalent to 45 days of capacity charges and energy charges is worked out and allowed as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Variable Charges - for 45 days of generation corresponding to NAPAF	9757.24	9757.24	9757.24	9757.24	9757.24
Fixed Charges – for 45 days of generation corresponding to NAPAF	7055.68	7007.70	6942.80	6009.19	6047.18
Total	**16812.92**	**16764.94**	**16700.04**	**15766.43**	**15804.42**

Working Capital for O&M Expenses (1 month)

101. The O&M expenses for 1 month as claimed by the Petitioner in Form-O is as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
1714.72	1731.68	1853.11	1928.31	2006.76

102. Regulation 34(1)(a)(vi) of the 2019 Tariff Regulations provide for O&M expenses equivalent to 1 month of the O&M expenses (including water charges and security expenses). Accordingly, O&M expenses equivalent to 1 month of the O&M expenses (including water charges and security expenses) allowed for the 2019-24 tariff period is as under: Accordingly, in terms of Regulation 34(1)(a)(vi) of the 2019 Tariff Regulations, one month's O&M expenses allowed is as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
1653.37	1717.65	1784.72	1856.00	1930.40

103. In line with the Regulation 34(3) of the 2019 Tariff Regulations, the rate of interest on working capital is considered as 12.05% (i.e. 1 year SBI MCLR of 8.55% as on 01.04.2019 + 350 bps) for the year 2019-20, 11.25% (i.e. 1 year SBI MCLR of 7.75% as on 01.04.2020 + 350 bps) for the year 2020-21,10.50% (i.e. 1 year SBI MCLR of 7.00% as on 01.04.2021 + 350 bps) for the year 2021-22 and 10.50% (i.e. 1 year SBI MCLR of 7.00% as on 01.04.2022 + 350 bps) for the period 2022-24. Accordingly, Interest on working capital has been computed as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Working Capital for Cost of Coal towards Stock (20 days corresponding to generation at NAPAF)	4299.22	4299.22	4299.22	4299.22	4299.22
Working Capital for Cost of Coal towards Generation (30 days corresponding to generation at NAPAF)	6448.83	6448.83	6448.83	6448.83	6448.83
Working Capital for Cost of Secondary fuel oil (2 months corresponding to generation at NAPAF)	114.89	114.57	114.57	114.57	114.89
Working Capital for Maintenance Spares 20% of Annual O&M expenses)	3968.08	4122.35	4283.34	4454.41	4632.97
Working Capital for Receivables – 45 days	16812.92	16764.94	16700.04	15766.43	15804.42
Working Capital for O&M expenses – 1 month	1653.37	1717.65	1784.72	1856.00	1930.40
Total Working Capital	**33297.31**	**33467.56**	**33630.73**	**32939.47**	**33230.73**
Rate of Interest	12.0500	11.2500	10.5000	10.5000	10.5000
Interest on Working Capital	**4012.33**	**3765.10**	**3531.23**	**3458.64**	**3489.23**

Annual Fixed Charges

104. Accordingly, the annual fixed charges approved for the 2014-19 tariff period for the generating station is summarized as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	13734.70	13753.17	13764.02	6213.25	6230.00
Interest on Loan	4753.58	3645.02	2526.39	1715.31	1212.41
Return on Equity	15045.22	15065.21	15075.53	15081.97	15087.26
Interest on Working Capital	4012.33	3765.10	3531.23	3458.64	3489.23
O&M Expenses	19840.40	20611.74	21416.68	22272.04	23164.83
Total	**57386.22**	**56840.25**	**56313.84**	**48741.21**	**49183.73**

Note: *(1) All figures are on annualized basis. (2) All figures under each head have been rounded. The figure in total column in each year is also rounded. As such the sum of individual items may not be equal to the arithmetic total of the column.*

105. The annual fixed charges approved above are subject to truing up in terms of Regulation 13 of the 2019 Tariff Regulations.

Application Fee and Publication expenses

106. The Petitioner has sought reimbursement of fee paid by it for filing the petition for the 2019-24 tariff period and for publication expenses. The Petitioner shall be entitled for reimbursement of the filing fees and publication expenses in connection with the present petition, directly from the beneficiaries on pro-rata basis in accordance with Regulation 70(1) of the 2019 Tariff Regulations.

107. Similarly, RLDC Fees & Charges paid by the Petitioner in terms of the Central Electricity Regulatory Commission (Fees and Charges of Regional Load Dispatch Centre and other related matters) Regulations, 2019, shall be recovered from the beneficiaries. In addition, the Petitioner is entitled for recovery of statutory taxes, levies, duties, cess etc. levied by the statutory authorities in accordance with the 2019 Tariff Regulations.

108. Petition No. 396/GT/2020 is disposed of in terms of the above.

Sd/-	Sd/-	Sd/-
(Pravas Kumar Singh)	**(Arun Goyal)**	**(I.S Jha)**
Member	**Member**	**Member**