CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 415/GT/2020

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

Date of Order: 15th June, 2023

IN THE MATTER OF

Petition for determination of tariff of Vindhyachal Super Thermal Power Station, Stage-V (500 MW) for the period 2019-24.

AND

IN THE MATTER OF:

NTPC Ltd.
NTPC Bhawan, Core-7,
Institutional Area, Lodhi Road,
New Delhi-110003 **…. Petitioner**

Vs

1. Madhya Pradesh Power Management Company Limited,
   Shakti Bhawan, Vidyut Nagar, Jabalpur 482008
2. Maharashtra State Electricity Distribution Company Limited,
   Prakashgad, Bandra (East),
   Mumbai 400051
3. Gujarat Urja Vikas Nigam Limited,
   Vidyut Bhawan, Race Course,
   Vadodara 390007
4. Chhattisgarh State Power Distribution Company Limited,
   PO Sunder Nagar, Dangania, Raipur – 492013
5. Electricity Department of Goa,
   Vidyut Bhawan, Panaji, Goa- 403001
6. Electricity Department,
   Administration of Daman & Diu,
   Daman 396210
7. Electricity Department,
   Administration of Dadra & Nagar Haveli, Silvassa 396230 **…Respondents**

Parties Present:

Shri Venkatesh, Advocate, NTPC
Shri Ashutosh K. Srivastava, Advocate, NTPC
Shri Abhishek Nangia, Advocate, NTPC
Shri A.S. Pandey, NTPC
Shri Anurag Naik, MPPMCL

ORDER

This petition has been filed by the Petitioner, NTPC Limited, for determination of tariff of Vindhyachal Super Thermal Power Station Stage-V (500 MW) (in short 'the generating station') for the period 2019-24, in accordance with Regulation 9(2) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (in short 'the 2019 Tariff Regulations'). The generating station with an installed capacity of 500 MW had achieved COD on 30.10.2015.

2. The Commission vide its order dated 31.8.2016 in Petition No. 234/GT/2015 had determined the tariff of the generating station for the period 2014-19. Subsequently, in Petition No. 239/GT/2020, the Commission vide its order dated 5.4.2023 had trued-up the tariff of the generating station, for the period 2014-19. Thereafter, vide corrigendum order dated 11.5.2023, certain inadvertent typographical/arithmetical errors (linkage errors) which had crept in order dated 5.4.2023, while considering the values for depreciation, repayment of loan and calculation of interest on working capital, were rectified and the annual fixed charges were modified. Accordingly, the capital cost and annual fixed charges allowed vide order dated 5.4.2023 read with corrigendum order dated 11.5.2023 is as under:

Capital Cost allowed

(Rs. in lakh)

	2015-16 (as on COD)	**2016-17**	**2017-18**	**2018-19**
Opening Capital Cost	196131.38	207149.05	253093.61	291360.76
Add: Additional capital expenditure	11017.67	45944.57	38267.15	7184.995
Closing Capital Cost	**207149.05**	**253093.61**	**291360.76**	**298545.76**
Average Capital Cost	201640.21	230121.33	272227.19	294953.26

Annual Fixed Charges allowed:

(Rs. in lakh)

	2015-16 (30.10.2015-31.3.2016)	2016-17	2017-18	2018-19
Depreciation	10523.27	12049.55	14276.90	15459.23
Interest on Loan	11025.84	11706.15	12003.46	12653.98
Return on Equity	12304.71	14042.71	16612.14	18046.73
Interest on Working Capital	4407.69	4618.85	4842.89	4955.49
O&M Expenses	8121.71	9429.87	9921.81	10523.36
Total	**46383.22**	**51847.13**	**57657.20**	**61638.79**

Present Petition

3. The Petitioner has filed the present Petition for determination of tariff of the generating station for the period 2019-24, in accordance with Regulation 9(2) of the 2019 Tariff Regulations and has claimed the following capital cost and annual fixed charges:

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	300407.24	306863.27	311563.27	312195.12	312854.12
Add: Addition during the year/ period	6456.03	4700.00	631.85	659.00	-
Closing capital cost	306863.27	311563.27	312195.12	312854.12	312854.12
Average capital cost	**303635.26**	**309213.27**	**311879.20**	**312524.62**	**312854.12**

(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	-	-	-	262.61	262.61
Add: Addition during the year/ period	-	-	262.61	-	-
Less: De-capitalization during the year/ period	-	-	-	-	-
Less: Reversal during the year/ period	-	-	-	-	-
Add: Discharges during the year/ period	-	-	-	-	-
Closing capital cost	-	-	262.61	262.61	262.61
Average capital cost	**-**	**-**	**131.30**	**262.61**	**262.61**

Annual Fixed Charges claimed

(Rs. *in lakh)*

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	16639.21	16944.89	17098.18	17140.74	17158.80
Interest on Loan	12340.61	11558.24	10339.24	8989.48	7553.35
Return on Equity	17660.64	17985.08	18143.91	18185.18	18204.24
Interest on Working Capital	3192.97	3218.29	3230.73	3238.86	3243.36
O&M Expenses	13580.20	14083.89	14609.12	15156.39	15721.24
Total	**63413.64**	**63790.39**	**63421.18**	**62710.65**	**61880.99**

4. The Respondents MSEDCL, CSPDCL and MPPMCL have filed their replies vide affidavits dated 16.6.2021, 28.6.2021 and 30.6.2021/ 5.8.2022, respectively. The Petitioner has filed its rejoinder to the abovesaid replies vide affidavit dated 29.6.2021 (CSPDCL), affidavit dated 29.6.2021 (MSEDCL) and affidavits dated 10.8.2022 and 17.8.2022 (MPPMCL). The Petitioner has also submitted certain additional information on 29.6.2021 and 19.7.2022, after serving copies on the Respondents. The Petition was heard through video conferencing on 14.7.2022 and the Commission, after hearing the parties, reserved its order, in the petition. Based on the submissions of the parties and the documents available on record and on prudence check, we proceed for determination of the tariff of the generating station for the 2019-24 tariff period, as stated in the subsequent paragraphs.

Capital Cost

5. Clause (1) of Regulation 19 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."

6. The annual fixed charges claimed by the Petitioner, is based on the opening capital cost of Rs. 298545.76 lakh, on cash basis, as on 31.3.2019, as allowed vide order dated 5.4.2023 in Petition No. 239/GT/2020 read with corrigendum dated 11.5.2023. Accordingly, in terms of Regulation 19(3) of the 2019 Tariff Regulations, the capital cost of Rs. 298545.76 lakh, on cash basis, has been considered as on 1.4.2019.

Additional Capital Expenditure

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

25. Additional Capitalisation 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 Capitalisation 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 law;

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

(c) Force Majeure events;

(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 Modernisation (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-capitalisation 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 decapitalisation 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-capitalisation takes place with corresponding adjustments in cumulative depreciation and cumulative repayment of loan, duly taking into consideration the year in which it was capitalised."

8. The projected additional capital expenditure claimed by the Petitioner for the generating station for the period 2019-24, is as under:

(Rs. in lakh)

Sl. No.	**Head of Work/Equipment**		**Additional capital Expenditure claimed (Actual / Projected)**				
		Regulation	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
A.	**Works under Original scope, Change in Law etc. eligible for RoE at Normal rate**						
1	Flue Gas Desulphurisation System	26(1)(b)	1000.00	-	-	-	-
2	ClO_2 package	26(1)(b) read with 26(1)(d)	-	-	131.85	659.00	-
3	Sewerage Treatment Plant	25(1)(d)	-	1100.00	-	-	-
4	Purchase of Wagons	25(1)(d)	-	1000.00	-	-	-
5	Electrical Equipment Package	25(1)(d)	455.00	-	-	-	-
6	Construction of boundary wall	25(1)(d)	51.03	-	-	-	-
7	Miscellaneous pack	25(1)(d)	400.00	-	-	-	-
8	Main Plant & Offsite Civil Packages	25(1)(d)	500.00	-	-	-	-
9	AC & Ventilation	25(1)(d)	200.00	-	-	-	-
10	Coal Handling Plant	25(1)(d)	1000.00	-	-	-	-

11	CW System	25(1)(d)	0.00	200.00	-	-	-
12	C&I System	25(1)(d)	100.00	-	-	-	-
13	Fire detection & Protection System	25(1)(d)	0.00	300.00	-	-	-
14	Ash Handling Plant	25(1)(d)	500.00	-	-	-	-
15	Electrical Equipment Package	25(1)(d)	50.00	-	-	-	-
16	Turbine Generator Package	25(1)(d)	1200.00	-	-	-	-
17	Railway Siding S&T works	25(1)(d)	1000.00	1100.00	-	-	-
18	ZLD Package	26(1)(b)	-	1000.00	500.00	-	-
	Total(A)		**6456.03**	**4700.00**	**631.85**	**659.00**	**-**
B.	**Works beyond the original scope excluding add-cap due to Change in Law eligible for RoE at Weighted Average rate of Interest**						
19	Integrated Security System	26(1)(d)	0.00	0.00	262.61	0.00	0.00
	Total (B)		**-**	**-**	**262.61**	**-**	**-**
Total Additional Capital Expenditure claimed (A+B)			**6456.03**	**4700.00**	**894.46**	**659.00**	**-**

9. We now examine the projected additional capital expenditure claimed by the Petitioner for the period 2019-24 as under:

<u>Additional Capital Expenditure within the original Scope of work</u>

10. The Petitioner has claimed additional capital expenditure of Rs. 6456.03 lakh in 2019-20 and Rs.3700.00 lakh in 2020-21 towards deferred works which are within the original scope of work, but already approved by Commission vide order dated 31.8.2016 in Petition No. 234/GT/2015.

Flue gas Desulphurization (FGD)

11. As regards additional capital expenditure of Rs. 1000 lakh claimed in 2019-20, for Installation of Flue gas Desulphurization (FGD) system, the Petitioner has submitted that the said work has been completed and the asset has been put to use. The Petitioner has also submitted that the Commission had allowed the capitalization of the item/asset vide its order dated 31.8.2016 in Petition No. 234/GT/2015 and the present claim is towards the balance payment of the work allowed and the amount of Liquidated Damage (LD) which was withheld, in view of defect rectification, is expected

to be released in 2019-20. The Respondent MPPMCL has submitted that the Petitioner has claimed additional capitalization of this asset under change in law, without submitting any evidence for the same and therefore, the claim, may be disallowed.

12. The matter has been considered. It is noticed that the Commission vide its order dated 31.8.2016 in Petition No.234/GT/2015 had allowed the additional capitalization towards FGD system, on the ground that the same is in compliance to the statutory guidelines of the MOEF, GOI as under:

> *35. We have examined the matter. It is observed from the submissions of the petitioner that expenditure towards FGD system has been planned by the petitioner in compliance with the guidelines laid down by the environmental clearance accorded by MoEF, GOI vide letter dated 2.5.2012 to minimize SO2 emissions, which mentions that the FGD shall be installed for the proposed expansion unit. Considering fact that the projected additional capital expenditure is incurred by the petitioner for compliance with the direction of MoEF, GOI for minimizing SO2 emissions of the area, we are inclined to allow the capitalization of the FGD system under Regulation 14(3)(ii) of 2014 Tariff Regulations. The capitalization is allowed as a special case by relaxing the provision of Regulation 14(1) in term of Regulation 54 of the 2014 Tariff Regulations. However, the same may not be quoted as a precedent in future. Xxxx*
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> *37. It is observed that the additional investment on account of installation of FGD system would require prudence check of the reasonability of the proposed expenditure and technology used should be commensurate with the requirement. Also, the benefits of the installation of this system should be made known to the procurers and the possible tariff impact on the tariff. Further, the petitioner has not submitted the details of packages awarded in respect of FGD as required under Form 5D of the tariff forms. In this background and based on the information available on record, the projected cost of the FGD system is provisionally considered as 80% of the claim of the petitioner i.e. Rs.16104 lakh (Rs.11632 lakh in 2016-17 and Rs.4472 lakh in 2017-18) and the same is subject to revision based on the actual capital expenditure incurred..."*

13. In line with the above decision, the additional capitalization claimed by the Petitioner towards FGD system in 2019-20 is allowed.

Sewerage Treatment Plant

14. The Petitioner has claimed additional capitalisation of Rs. 1100 lakh, towards Sewage Treatment Plant in 2020-21, under Regulation 25(1)(d) of 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the work is

covered under the original scope of work and the delay in execution of the same beyond the cut-off date, is due to encroachment of villagers on the land of the Petitioner, outside the plant boundary, for which help from administration was sought for making the land available. The Petitioner has stated that this work is now nearing completion and is expected to be completed and capitalised in 2019-20.

15. The matter has been considered. We notice that the additional capital expenditure claimed for the said asset/item, fall within the original scope of work, but could not be completed due to encroachment of villagers resulting in the non-availability of land. In this background, the claim of the Petitioner is **allowed** under Regulation 25(1)(e) of the 2019 Tariff Regulations. However, the Petitioner is directed to furnish the documentary evidence of the reasons for delay at the time of truing up of tariff.

Assets claimed under Sl nos. 5 to 15

16. The Petitioner has claimed total additional capital expenditure of Rs. 3526.03 lakh in 2019-20 and Rs.500.00 lakh in 2020-21, towards packages like Electrical Equipment package, Construction of boundary wall, Miscellaneous package, Main plant office and building, AC & Ventilation, Coal Handling System, CW system, C&I System, Fire detection and protection system and Ash Handling System (at per items in Sl Nos 5 to 15 of the table under paragraph 8 above). In justification of the same, the Petitioner has submitted that these works/packages pertain to the original scope of work and the same have been completed within the cut-off date of the generating station. However, the Petitioner has stated that on account of non-closure of the contract in view of various reasons like final settlement of bill, defect rectification, price adjustment as per the contract, these balance amounts are still to be released. The

Petitioner has stated that most of these deferred liabilities are proposed to be released during the years 2019-20 and 2020-21, during the contract closure.

17. The Respondent MPPMCL and CSPDCL have submitted that the Petitioner needs to clarify as why it has made two different claims worth Rs.455 lakh and Rs. 50 lakh in 2019-20 under Electrical Equipment Package. The Respondents have further submitted that these small value items should be met through O&M expenses. In response, the Petitioner has submitted that the amounts pertain to the contract closure related payments and have been claimed under two heads since they pertain to different vendors. As regards the claim of the Petitioner towards Miscellaneous Package, these Respondents have submitted that since these are small items and are not capital in nature, the same may not be allowed to be capitalized.

18. We have considered the submissions. It has been observed that the claim of the Petitioner, in respect of the items in Sl Nos. 5 to 15 fall within the original scope of work of the project and have been completed within the cut-off date of the generating station. However, as the claims of the Petitioner pertain to the release of the payments withheld on account of contract closure, the same is **allowed** under Regulation 25(1)(d) of the 2019 Tariff Regulations. However, the Petitioner is directed to submit the details of the items covered under Miscellaneous package (amounting to Rs 400 lakh) at the time of truing up of tariff.

Turbine Generator Package

19. The Petitioner has claimed additional capital expenditure of Rs.1200 lakh, towards works related to Turbine Generator Package in 2019-20, under Regulation 25(1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the work of the Turbine Generator has already been completed within

the cut-off date of the generating station. It has however submitted that in view of defect removal, PG test and final settlement of bills, the balance amount is to be released during the contract closing process in 2019-20. Since, the amount claimed by the Petitioner under this head pertains to final settlement of bills and the release of balance payment on account of defect removal and PG test, is in respect of works executed prior to the cut-off date, the same is **allowed**.

Railway Siding S&T works

20. The Petitioner has claimed additional capital expenditure of Rs. 1000 lakh in 2019-20 and Rs.1100 lakh in 2020-21, towards Railway Siding S&T works, under Regulation 25(1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the work of railway siding got delayed due to delay in approval from Indian Railways. It has stated that the fifth yard i.e., Shaktinagar Exchange Yard was meant to facilitate coal rakes movement between NCL, NTPC and Indian Railways Main line. It has however submitted that the works got delayed due to multiple revisions of Engineering Scale Plan (ESP) by Indian Railways. The Petitioner has further submitted that due to delay in the approval of ESP, the civil works of Shaktinagar exchange yard had to be re-tendered by M/s RITES. It has stated that to optimize on cost and time and to save on land acquisition, the work was modified to complete track renewal of existing five tracks in place of laying of seven number tracks. The Petitioner while pointing out that the Commission has allowed relaxation for completion of these works pertaining to Railway siding vide order dated 9.5.2019 in Petition No. 130/MP/2018, has submitted that availability of front by Indian Railways got delayed and RITES could not take up the job of connection of Railway line to the Main line for all the tracks within 31.3.2019. In this regard, the Petitioner has submitted that Indian Railways, after visit of Commissioner (Railway Safety) & DRM/ECR on

19.8.2018, decided to commission new KBJ diversion line and for that, all 5 lines of NTPC exchange yard was to be disconnected and recommissioned as per new alignment. It has also stated that the permission for traffic block to carry out job of yard line no.4 and complete other works pertaining to the exchange yard was accorded by Indian Railways in the month of April, 2019 (letters from RITES attached in Annexure-A). Accordingly, the Petitioner has submitted that on account of this unforeseen delay, the associated jobs of S&T and Electrical system package also got delayed beyond 31.3.2019. The Petitioner has stated that the Railway siding work was completed in 2018-19 and has been capitalized in the books, however, the balance work got further delayed on account of the reasons beyond its control. It has further submitted that in June 2019, the balance track work (along with alignment) and the S&T work has been completed.

21. The Respondent MPPMCL has submitted that the Petitioner should be directed to submit the details of LD claim of the contractor. The Respondent has further submitted that the plant is operating well above the normative PLF i.e., 93% and 95% in 2019-20 and 2020-21 respectively, with existing railway/ coal handling system and hence there appears to be no justification for Railway siding works. The Respondent has also submitted that the Petitioner may be directed to provide the details of IDC and IEDC claimed. The Petitioner in Form 9 A has submitted the detailed reasons and justification and has submitted that maximum work pertaining to Railway siding and the S&T works were completed and capitalized in 2018-19. It has submitted that the additional capital expenditure has been claimed on the projection basis, for the balance works such as alignment and the actual values will be provided at the time of truing up of tariff.

22. We have considered the matter. The Petitioner has claimed additional capital expenditure towards Railway Siding S&T works, which are within the original scope of work of the project. It is observed that the Commission vide its order dated 9.5.2019 in Petition No. 130/MP/2018 had allowed the additional capitalization of the works pertaining to Railway works beyond the cutoff date of the generating station as under:

> *22. We have examined the matter related to delay in works involving Railway's approval and delay in supply of wagons. From the documents furnished by the petitioner, we observe that the petitioner has placed the order well in time and also made correspondences with the concerned agency for timely supply/completion of the pending works. We are of the opinion that the delay in works due to Railway's approval and delay in supply of wagons is not attributable to the Petitioner. Therefore, the Commission is of the view that it is appropriate to allow capitalization of the works/assets pertaining to Shaktinagar Exchange Yard and Supply of Wagons beyond cut-off date and upto 31.03.2019, as the same got delayed due to Railway's approval.*
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> *23. Based on the above discussion, we allow capitalization of expenditure beyond cut-off date of 31.03.2018 and upto 31.03.2019 for works related to Shaktinagar Exchange Yard and Supply of Wagons. The Power to Relax under Regulation 54 of the 2014 Tariff Regulation is invoked to this extent only, without relaxing the cut-off date in general*

23. It is noticed from the above that the capitalization of the said asset has been allowed upto 31.3.2019. The Petitioner has submitted that major works have been completed but some balance works could not be completed due to unforeseen circumstances as mentioned above, resulting in spillover of the work to 2019-20 and 2020-21. Considering the submissions of the Petitioner, we permit the additional capitalization of the balance works during 2019-20 and 2020-21. However, the Petitioner is directed to submit the details of IDC and IEDC included in the above claim at the time of truing up of tariff.

Purchase of Wagons

24. The Petitioner has claimed additional capital expenditure of Rs. 1000 lakh, towards Purchase of wagon, under Regulation 25(1)(d) of the 2019 Tariff Regulations. The Petitioner, in justification of the same, has submitted that the additional wagons for transportation of coal were planned to be procured for the generating station.

However, it has submitted that subsequent to implementation of GST, the Purchase Order (PO) was amended on 9.12.2017 with revised supply scheduled by February 2018. It has stated that since, the wheel for the wagons is proprietary item of the Railway, M/s Jupiter had placed the PO for proprietary wheel sets on Railway Wheel Factory (RWF), Bangalore on 1.2.2017 with supply period of 90 days. Subsequently, the POs were amended 2 to 3 times due to fluctuation in prices of steel and changes in taxation rates subsequent to GST implementation. The POs by M/s Jupiter was finally amended and accepted by RWF, Bangalore on 7.3.2018 and payment was remitted on 17.3.2018. It has further submitted that as per specification of Research Designs and Standards Organization (RDSO), the procurement of 'Z' section was to be made necessarily from Steel Authority of India (SAIL). The Petitioner has stated that the delay in supply of wheel sections and AXLE sets from RWF Bangalore and Z sections from SAIL has caused a delay in manufacturing and supply of wagons. It has stated that the Commission has also accepted these as uncontrollable, vide order dated 2.5.2019 in Petition no. 130/MP/2018. The Petitioner has further submitted that despite repeated follow-up, the supply of wagon spilled over 31.3.2019, and the same could not be materialised on account of denial of the agency M/s Jupiter to accept our proposal and consistent insistence to increase the price, which was not acceptable to the Petitioner. In view of the same, the Petitioner has submitted that the PO for wagons was cancelled and the same is expected to be issued shortly to other agency, and the supply is expected by 2020-21.

25. The Respondent MPPMCL and CSPDCL have submitted that the Petitioner has not submitted any justification for the requirement of additional wagons. These Respondents have further stated that the plant has been running well above the

normative PLF and hence there is no justification for the purchase of additional wagons.

26. We have considered the matter. It is observed that the Petitioner has claimed the additional capitalisation of the asset/item which are within the original scope of works and the same has been delayed due to factors, which were not within the control of the Petitioner. It is also observed that the Commission vide its order dated 2.5.2019 in Petition No. 130/MP/2018 has allowed the additional capitalization of Railway related works beyond the cut-off date and till 31.3.2019. In view of the submission of the Petitioner, and in line with the earlier decision, the claim of the Petitioner for the said asset is **allowed**. However, the Petitioner shall submit the details of the value of old purchase order placed on M/s Jupiter and the revised order placed along with justification for the variation in cost, at the time of truing up of the tariff.

Additional Capital Expenditure towards new Claims beyond the original scope of work

Zero Liquid Discharge System

27. The Petitioner has claimed additional capital expenditure of Rs. 1000 lakh in 2020-21 and Rs.500 lakh in 2021-22, towards installation of Zero Liquid Discharge System, under Regulation 26(1)(b) of 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that Zero Liquid Discharge system is being installed in the generating station as per the directions of State Pollution Control Board for "Consent to Operate".

28. The Respondent MPPMCL has submitted that though the claim of the Petitioner is based on consent letter of Pollution Control Board, the said condition is only to ensure that the treated effluent should not be discharged outside the premises of the

plant. According to the Respondent, the same is possible even without the installation of ZLD and therefore, the claim of the Petitioner may be rejected.

29. The submission has been considered. It has been observed that the Commission vide order dated 23.3.2022 in Petition No. 419/GT/2020 (approval of tariff for Korba STPS Stage III for 2019-24) has disallowed the claim of the Petitioner for this asset. The relevant extract of the order is reproduced below:

> *14. The submissions have been considered. It is noticed that the CECB consent order dated 9.10.2018 is a renewal of consent of the generating station. It is not clear from the submissions of the Petitioner as to what compliances are to be made by the Petitioner in terms of the said order and whether it had been complying with the earlier directives, if any. Moreover, the Petitioner has also not projected any requirement of installations, in addition to the presence of existing facilities like Sewage Treatment Plant (STP), Effluent Treatment Plant and Ash Slurry recovery water system from ash dyke. It is pertinent to mention that the Petitioner has also filed Petition No. 521/MP/2020 (NTPC v MPPMCL & ors) before this Commission seeking approval of the additional expenditure for installation of various Emission Control Systems in the generating station in compliance to the MOEF&CC, GoI Notification dated 7.12.2015. In the said petition, the Petitioner had prayed for grant of liberty to approach the Commission for approval of implementation of Revised Emission Systems on account of mercury, particulate matter, including specific water consumption, if required. The Commission by order dated 28.4.2021 has disposed of the said petition granting liberty to the Petitioner on this ground. As the said works are quite complimentary to the additional capital expenditure claimed by the Petitioner on account of ZLD work, in the present petition, the Petitioner's claim for additional capital expenditure of Rs.1200.00 lakh towards ZLD work in 2019-21 is not allowed. The Petitioner may claim the additional capital expenditure in a comprehensive manner in terms of liberty granted vide order dated 30.9.2021 in Petition No. 521/MP/2020.*

30. Similar view has been taken in respect of the additional capitalisation claim of the Petitioner in other tariff petitions for the period 2019-24. In view of the above, the claim of the Petitioner on this count is **not allowed**. However, in terms of the liberty granted by the Commission in order dated 23.3.2022 in Petition No. 419/GT/2020, the Petitioner may approach this Commission, seeking additional capital expenditure in a comprehensive manner, which will be considered in accordance with law.

CLO_2 Package

31. The Petitioner has claimed projected additional capital expenditure of Rs.131.85 lakh in 2021-22 and Rs.659.00 lakh in 2022-2, towards CLO2 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 dozed, from chlorine stored in cylinders/ tonners, 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. Chlorine gas is very hazardous and may prove fatal in case of leakage. In the interest of public safety, the chlorine dozing system is now being replaced by Chlorine Dioxide (ClO2) system, which is much safer and less hazardous than chlorine. In the proposed scheme Clo2 shall be produced on site by use of commercial grade HCl and Sodium Chlorite and accordingly avoids handling and storage risk. Further, at Kudgi NTPC project Department of Factories, Boiler, Industrial Safety and Health, Government of Karnataka has asked NTPC to consider replacement of highly hazardous gas Chlorination system with ClO2 system. SPCB, Odisha while issuing consent to establish in case of Darlipalli Station has asked NTPC to explore the possibility of installing ClO2 system instead of Chlorine gas system. The Petitioner further submitted that for safety of public NTPC is replacing the Chlorination system with ClO2 system.

32. The Respondent MPPMCL has submitted that there is no incidence of change in law or compliance of any existing law in the instant matter which can warrant quoting of regulation 26(1)(b) and as such this claim is liable to be rejected.

33. We have considered the matter. The Petitioner has claimed additional capitalization of this asset/item under Regulation 26(1)(b) of the 2019 Tariff Regulations. The Petitioner has submitted that for Kudgi project of the Petitioner, the Government of Karnataka had directed the Petitioner to replace the highly hazardous

gas chlorination system with ClO_2 system. It is observed that the letter dated 23.9.2019 addressed by the Directorate of Factories, Industrial Safety & Health State Government of Karnataka to the GM, NTPC pertains to site clearance of Kudgi Super Thermal Power station of the Petitioner. This letter can in no manner be termed as a change in law event in respect of this generating station warranting capitalization of the expenditure. As regards the claim of the Petitioner under Regulation 26(1)(d) of the 2019 Tariff Regulations, we find no specific direction or advice from any Governmental or statutory authorities as regards the need for this item (chlorine dozing system is being replaced by Chlorine Dioxide (ClO2) system) for the safety and security of the generating station. Though the Petitioner has relied upon the 2020 Code to justify its claim, it is noticed that the State Government, in respect of this generating station, has not issued any directions, as done by the State Govts. of Karnataka and Odisha. In view of this, the projected additional capitalization claimed by the Petitioner on this count is **not allowed**.

Integrated Security System

34. The Petitioner has claimed projected additional capital expenditure of Rs.262.61 lakh in 2021-22, towards Integrated Security System (ISS), under Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that it is for enhancement and automation of security at the power project, in view of consistent threat as per reports from external agencies. The Petitioner has also submitted that, in collaboration with CISF, the Petitioner has prepared a comprehensive multilayer e security system, to be installed in various power stations across the country. The Petitioner has also stated that the ISS proposed to be installed in the generating station during the period 2019-24, shall not only enhance the reliability of the security system, but will also help rationalize the security manpower in

the generating station. The Petitioner has also attached a copy of the communication in this regard with DG, CISF. Further, the Petitioner has also attached a copy of MOP, GOI letter dated 23.10.2019 directing all CPSU's including the Petitioner to strengthen the security of vital installations.

35. The Respondent MPPMCL has submitted that the claim of the Petitioner is misconceived. The Respondent has further submitted that this has been done by the Petitioner on its own initiative, as evident form letter dated 26.11.2018 of AGM (HR-S&C) addressed to IG, CISF. Accordingly, it has submitted that the claim may be rejected and the same can be met through O&M expenses.

36. The matter has been considered. In our view, since the projected additional capital expenditure claimed is necessary for higher security and safety of the generating station as recommended by DG, CISF, the claim of the Petitioner is **allowed** under Regulation 26(1)(d) of the 2019 Tariff Regulations. However, the Petitioner is directed to provide breakup of the actual expenditure incurred towards the said additional capital expenditure at the time of truing up of tariff.

37. Accordingly, the additional capital expenditure allowed for the period 2019-24 is summarized as under:

(Rs. in lakh)

Sl. No.	Head of Work /Equipment		**Additional Capital Expenditure allowed**				
			2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
A.	**Works under Original scope, Change in law etc. eligible for RoE at normal rate**						
1	Flue Gas Desulphurisation System		1000.00	0.00	0.00	0.00	0.00
2	ZLD Package		0.00	0.00	0.00	0.00	0.00
3	Sewerage Treatment Plant		0.00	1100.00	0.00	0.00	0.00
4	Purchase of Wagons		0.00	1000.00	0.00	0.00	0.00
5	ClO2 package		0.00	0.00	0.00	0.00	0.00
6	Electrical Equipment Package		455.00	0.00	0.00	0.00	0.00
7	Construction of boundary wall		51.03	0.00	0.00	0.00	0.00

8	Miscellaneous pack		400.00	0.00	0.00	0.00	0.00
9	Main Plant & Offsite Civil Packages		500.00	0.00	0.00	0.00	0.00
10	AC & Ventilation		200.00	0.00	0.00	0.00	0.00
11	Coal Handling Plant		1000.00	0.00	0.00	0.00	0.00
12	CW System		0.00	200.00	0.00	0.00	0.00
13	C&I System		100.00	0.00	0.00	0.00	0.00
14	Fire detection & protection System		0.00	300.00	0.00	0.00	0.00
15	Ash Handling Plant		500.00	0.00	0.00	0.00	0.00
16	Electrical Equipment Package		50.00	0.00	0.00	0.00	0.00
17	Turbine Generator Package		1200.00	0.00	0.00	0.00	0.00
18	Railway Siding S&T works		1000.00	1100.00	0.00	0.00	0.00
	Total(A)		**6456.03**	**3700.00**	**0.00**	**0.00**	**0.00**
B.	**Works beyond Original scope excluding add-cap due to Change in Law eligible for RoE at Weighted Average rate of Interest**						
19	Integrated Security System	26(1)(d)	0.00	0.00	262.61	0.00	0.00
	Total (B)		0.00	0.00	**262.61**	0.00	0.00
Total Additional Capital Expenditure claimed (A+B)			**6456.03**	**3700.00**	**262.61**	**0.00**	**0.00**

Capital cost allowed for the period 2019-24

38. Based on above, the capital cost allowed for the purpose of tariff is as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Opening capital cost	298545.76	305001.79	308701.79	308964.40	308964.40
Add: Additional capital expenditure	6456.03	3700.00	262.61	0.00	0.00
Closing capital cost	**305001.79**	**308701.79**	**308964.40**	**308964.40**	**308964.40**
Average capital cost	301773.78	306851.79	308833.09	308964.40	308964.40

Debt Equity Ratio

39. 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.

40. The gross normative loan and equity of the generating station as on 31.3.2019 approved by the Commission vide its order dated 5.4.2023 read with corrigendum dated 11.5.2023 in Petition No. 239/GT/2020 is Rs.208982.25 lakh (i.e., 70% of the admitted capital cost as on 31.3.2019) and Rs.89563.81 lakh (i.e., 30% of the admitted capital cost as on 31.3.2019), respectively. Accordingly, in terms of Regulation 18(3) of the 2019 Tariff Regulations, the gross normative loan and equity to be considered as on 1.4.2019 works out to Rs. 208982.25 lakh and Rs. 89563.81 lakh respectively. Further, the projected additional capital expenditure approved above has been allocated to debt and equity in debt: equity ratio of 70:30.

Return on Equity

41. 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.

42. 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%.

(2) The generating company or the transmission licensee as the case may be shall true up the grossed-up rate of return on equity at the end of every financial year based on actual tax paid together with any additional tax demand including interest thereon duly adjusted for any refund of tax including interest received from the income tax authorities pertaining to the tariff period 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."

43. The Petitioner has claimed Return on Equity (ROE) considering the base rate of 15.50% and effective tax rate of 17.472% for the opening equity as on 1.4.2019 and the projected additional capital expenditure claimed within the original scope of work, change in law etc. for the period 2019-24. This has been considered for the purpose of tariff. Further, for the additional capital expenditure claimed beyond the original scope of work (excluding additional capital expenditure due to change in law), the Petitioner has claimed ROE after grossing up WAROI of 7.8917% in 2021-22, 7.8553% in 2022-23 and 7.7455% in 2023-24 with effective tax rate of 17.472%.

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 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 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 also required to be grossed up with the effective tax rate of the respective financial year. Accordingly, ROE has been worked out as under:

Return on Equity at Normal Rate

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Notional Equity- Opening	89563.81	91500.62	92610.62	92610.62	92610.62
Less: Adjustment to equity in terms of 1st proviso to Regulation 18(3)	0.00	0.00	0.00	0.00	0.00
Normative Equity- Opening	**89563.81**	**91500.62**	**92610.62**	**92610.62**	**92610.62**
Add: Addition of Equity due to additional capital expenditure	1936.81	1110.00	-	-	-
Normative Equity – Closing	**91500.62**	**92610.62**	**92610.62**	**92610.62**	**92610.62**
Average Normative Equity	90532.21	92055.62	92610.62	92610.62	92610.62
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%
Effective Tax Rate for respective years	17.4720%	17.472%	17.472%	17.472%	17.472%
Rate of Return on Equity (Pre-tax)	18.782%	18.782%	18.782%	18.782%	18.782%
Return on Equity (Pre-tax) - (annualised)	**17003.76**	**17289.89**	**17394.13**	**17394.13**	**17394.13**

Return on Equity at WAROI

(Rs. in lakh)

	2021-22	2022-23	2023-24
Gross Notional Equity	0.00	78.78	78.78
Less: Adjustment to equity in terms of 1st proviso to Regulation 18(3)	0.00	0.00	0.00
Normative Equity – Opening	**0.00**	**78.78**	**78.78**
Addition of Equity due to additional capital expenditure	78.78	0.00	0.00
Normative Equity – Closing	**78.78**	**78.78**	**78.78**
Average Normative Equity	39.39	78.78	78.78
Return on Equity (Base Rate) (%)	7.8917%	7.8553%	7.7455%
Effective Tax Rate	17.472%	17.472%	17.472%
Rate of Return on Equity (Pre-tax)	9.562%	9.518%	9.385%
Return on Equity (Pre-tax) - (annualized)	**3.77**	**7.50**	**7.39**

<u>Interest on loan</u>

44. Regulation 32 of the 2019 Tariff Regulations provides as under:

"32. Interest on loan capital: (1) The loans arrived at in the manner indicated in Regulation 18 of 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."

45. The Petitioner has claimed tariff considering the WAROI of 7.7631% in 2019-20, 7.9124% in 2020-21, 7.8917% in 2020-21, 7.8553% in 2022-23 and 7.7455% in 2023-24 and the same has been considered. Accordingly, Interest on loan has been worked out as under:

i) The gross normative loan of Rs.208982.25 lakh as on 1.4.2019, as considered in order dated 5.4.2023 in Petition No. 239/GT/2020 read with corrigendum dated 11.5.2023 has been retained as on 1.4.2019.

ii) Cumulative repayment of Rs. 46057.51 lakh as on 1.4.2019, as considered in order dated 5.4.2023 in Petition No. 239/GT/2020 read with corrigendum dated 11.5.2023 has been retained as on 1.4.2019.

iii) Accordingly, the net normative opening loan as on 1.4.2019 works out to Rs.162924.75lakh.

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.

46. The necessary calculation of interest of loan is as under:

(Rs. in lakh)

		2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
A	Gross opening loan	208982.25	213501.47	216091.47	216275.29	216275.29
B	Cumulative repayment of loan upto previous year	46057.50	62594.70	79410.18	96334.23	113265.48
C	Net Loan Opening (A-B)	162924.75	150906.77	136681.29	119941.06	103009.81
D	Addition due to additional capital expenditure	4519.22	2590.00	183.82	-	-
E	Repayment of loan during the year	16537.20	16815.48	16924.05	16931.25	16931.25
F	Net Loan Closing (C+D-E)	150906.77	136681.29	119941.06	103009.81	86078.56

G	Average Loan [(C+F)/2]	156915.76	143794.03	128311.18	111475.44	94544.19
H	WAROI	7.7631%	7.9124%	7.8917%	7.8553%	7.7455%
I	**Interest on Loan (G x H)**	**12181.53**	**11377.56**	**10125.93**	**8756.73**	**7322.92**

Depreciation

47. 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."

48. The cumulative depreciation amounting to Rs. 46083.16 lakh as on 31.3.2019 as considered in order dated 5.4.2023 in Petition No. 239/GT/2020 read with corrigendum dated 11.5.2023 has been considered as on 1.4.2019. The value of freehold land has been considered as Rs.714.20 lakh. Accordingly, the balance depreciable value, before providing depreciation for the year 2019-20, works out to Rs. 270953.62 lakh as on 1.4.2019. Further, the value of IT assets has been considered as 'nil' as the Petitioner has not submitted the details. The Petitioner is directed to submit the details of the IT assets at the time of truing up of tariff. Necessary calculations in support of depreciation are as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Existing Assets					
Average capital cost (A)	301773.78	306851.79	308833.09	308964.40	308964.40
Value of freehold land included above (B)	714.20	714.20	714.20	714.20	714.20
Aggregated depreciable Value [C = (A-B) x 90%]	270953.62	275523.83	277307.00	277425.18	277425.18
Remaining Aggregate Depreciable value at the beginning of the year (D = C – 'J' of previous year)	224870.45	212903.46	197871.16	181065.28	164134.03
Weighted average rate of depreciation (F)	5.4800%	5.4800%	5.4800%	5.4800%	5.4800%
Depreciation during the year (G = D/E)	**16537.20**	**16815.48**	**16924.05**	**16931.25**	**16931.25**
Cumulative depreciation at the end of the year, before adjustment of de-capitalisation adjustment (H = G + 'H' of previous year)	**62620.37**	**79435.84**	**96359.90**	**113291.15**	**130222.40**

O&M Expenses

49. Regulation 35(1)(1) of the 2019 Tariff Regulations provides for the following O&M expenses:

Year	500 MW (lakh/ MW)
2019-20	22.51
2020-21	23.30
2021-22	24.12
2022-23	24.97
2023-24	25.84

50. The O&M expenses claimed by the Petitioner are 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)**	11255.00	11650.00	12060.00	12485.00	12920.00
O**&M expenses under Regulation 35(1)(6) of the 2019 Tariff Regulations**:					
- Water Charges	839.77	869.16	899.58	931.07	963.65
- Security Expenses	420.17	462.18	508.40	559.24	615.17
- O&M Expenses towards FGD	1065.26	1102.55	1141.14	1181.08	1222.41
- Capital Spares consumed	0.00	0.00	0.00	0.00	0.00
Total O&M Expenses	**13580.20**	**14083.89**	**14609.12**	**15156.39**	**15721.24**

51. The normative O&M expenses claimed by the Petitioner, is in terms of Regulation 35(1)(1) of the 2019 Tariff Regulations and hence allowed for the purpose of tariff.

Water Charges

52. Regulation 35(1)(6) of the 2019 Tariff Regulations provides for claim towards water charges, security expenses and capital spares as under:

"35(1)(6) The Water, Security Expenses and Capital Spares for thermal generating stations shall be allowed separately and after prudence check:

Provided that water charges shall be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check. The details regarding the same shall be furnished along with the petition and considering the norms of specific consumption notified by Ministry of Environment and Forest and Climate Change

53. The actual water charges claimed by the Petitioner in Petition No. 239/GT/2020 for the period 2014-19 and allowed by order dated 5.4.2023 is as under:

(Rs. in lakh)

	2015-16 (31.10.2015-31.3.2016)	2016-17	2017-18	2018-19
Water Charges Claimed	892.46	835.87	785.52	811.37
Water Charges Allowed	**892.46**	**835.87**	**785.52**	**811.37**

54. In terms of the above regulation, water charges are to be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check. The Petitioner has claimed water charges based on actual water consumption of the generating station. The water charges claimed by the Petitioner is as under:

	Remarks
Type of plant	Coal based Thermal Power Plant
Type of cooling water system	Closed Circuit Cooling System
Yearly allocation of water for VSTPS*	149MCM
Rate of water charges*	Rs.5.5/ Cubic Meter
Total water charges paid for VSTPS (2018-19)	811.37 lakh

55. The Petitioner has claimed water charges for the period 2019-24 on the basis of water charges claimed for 2018-19 with annual escalation of 3.50%, as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
839.77	869.16	899.58	931.07	963.65

56. Further, the Petitioner vide affidavit dated 29.6.2021 has submitted the details of the actual water charges incurred for the years 2019-20 and 2020-21 as Rs.777.54 lakh and Rs.775.41 lakh respectively.

57. We have examined the matter. It is observed that the water charges for the period 2021-24 has been arrived on the basis of water charges claimed for 2018-19 with annual escalation of 3.50%. It is also observed that the rate of water charges

considered by the Petitioner for the period 2019-24 is the same as considered for the period 2014-19. Accordingly, we are not inclined to allow the annual escalation of 3.50% as claimed by the Petitioner. Further, based on the actual water charges incurred by the Petitioner for the years 2019-20 and 2020-21, which amounted to Rs.777.54 lakh and Rs.775.41 lakh respectively, water charges for 2019-20 are allowed as Rs. 777.54 lakh and Rs. 775.41 lakh for the period 2020-24. Accordingly, the water charges claimed and allowed, for the period 2019-24 is as under:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Water charges claimed	839.77	869.16	899.58	931.07	963.65
Water charges allowed	777.54	775.41	775.41	775.41	775.41

58. The above water charges allowed are subject to truing-up in terms of the provisions of the regulations.

Capital Spares

59. The Petitioner has not claimed capital spares during the period 2019-24, but has submitted that the same shall be claimed, based on actual consumption of spares at the time of truing up of tariff, 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.

Security Expenses

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

(Rs. in lakh)

2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
420.17	462.18	508.40	559.24	615.17

61. The Petitioner has submitted that above expenses has been claimed based on the estimated expenses for the period 2019-24, and is subject to retrospective

adjustment, based on actuals at the time of truing up. Further, the Petitioner, vide affidavit dated 29.6.62021, has submitted the actual security expenses for 2019-20 and 2020-21 as Rs.465.84 lakh and Rs.498.59 lakh respectively.

62. We have examined the matter. The Petitioner 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 security expenses at the time of truing up of tariff. For the present, the projected security expenses for the period 2019-24, has been considered for the purpose of tariff. Accordingly, the security expenses claimed and allowed, subject to truing up, for the generating station for the 2019-24 tariff period is under:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Security expenses claimed	420.17	462.18	508.40	559.24	615.17
Security expenses allowed	**465.84**	**498.59**	**508.40**	**559.24**	**615.17**

<u>O&M Expenses on account of FGD</u>

63. The Petitioner has claimed additional O&M expenses on account of FGD as under:

(Rs. in lakh)

2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
1065.26	1102.55	1141.14	1181.08	1222.41

68. The Petitioner has claimed the above O&M expenses on account of FGD by escalating the O&M expenses of 2018-19. It is observed that the O&M expenses on account of FGD, were allowed on actuals, in order dated 5.4.2023 in Petition 239/ GT/ 2020 as there was no provision pertaining to O&M on account of installation of FGD. However, for the period 2019-24, the Commission has specified the norms for O&M expenses on account of installation of FGD, as under:

> *16.2. Sub-clause (7) of Clause (1) of Regulation 35 of the Principal Regulations along with its proviso shall be substituted as under:*

"(7) The operation and maintenance expenses on account of emission control system in coal or lignite based thermal generating station shall be 2% of the admitted capital expenditure (excluding IDC and IEDC) as on its date of operation, which shall be escalated annually @3.5% during the tariff period ending on 31st March 2024:
Provided that income generated from sale of gypsum or other by products shall be reduced from the operation and maintenance expenses."

69. In line with the above, the O&M expenses are allowed for the period 2019-24, based on actuals of 2018-19, without considering the annual escalation. The Petitioner is however, directed to submit the details pertaining to actual COD of FGD, IEDC and IDC included in the cost of FGD claimed by the Petitioner, at the time of truing-up of tariff.

70. Accordingly, the total O&M expenses including water charges and security expenses, as claimed by the Petitioner and allowed to the generating station for the period 2019-24 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)**	11255.00	11650.00	12060.00	12485.00	12920.00
Normative O&M expenses allowed under Regulation 35(1)(1) of the 2019 Tariff Regulations (b)	11255.00	11650.00	12060.00	12485.00	12920.00
Water Charges claimed under Regulation 35(1)(6) of the 2019 Tariff Regulations **(c)**	839.77	869.16	899.58	931.07	963.65
Water Charges allowed under Regulation 35(1)(6) of the 2019 Tariff Regulations (d)	777.54	775.41	775.41	775.41	775.41
Security Expenses claimed under Regulation 35(1)(6) of the 2019 Tariff Regulations **(e)**	420.17	462.18	508.40	559.24	615.17
Security Expenses allowed under Regulation 35(1)(6) of the 2019 Tariff Regulations (f)	465.84	498.59	508.40	559.24	615.17
O&M Expenses on Account of FGD- Claimed	1065.26	1102.55	1141.14	1181.08	1222.41

O&M Expenses on Account of FGD- Allowed	1029.24	1029.24	1029.24	1029.24	1029.24
Total O&M expenses claimed under Regulation 35 of the 2019 Tariff Regulations (a + c + e)	**13580.20**	**14083.89**	**14609.12**	**15156.39**	**15721.24**
Total O&M expenses allowed under Regulation 35 of the 2019 Tariff Regulations (b + d + f)	**13527.62**	**13953.24**	**14373.05**	**14848.89**	**15339.82**

Additional expenditure towards Fly ash transportation

71. The Petitioner has claimed recovery of additional expenditure of Rs.712.00 lakh in 2019-20 and 2020-21, subject to truing up, from the beneficiaries on account of ash transportation charges after adjusting the revenue earned from sale of ash. The Petitioner submitted that pursuant to issuance of Notification dated 25.1.2016 by MOEFCC, the Petitioner had filed Petition No. 172/MP/2016 seeking recovery of additional expenditure incurred due to sharing of fly ash transportation cost as "Change in Law" event. The Commission vide its order dated 5.11.2018 in Petition No. 172/MP/2016 recognised Notification dated 25.1.2016 as 'Change in Law' event and admitted the claims that is amount spent over and above ash sale fund on account of ash transportation and has directed as under:

> *"31. Accordingly, we in exercise of the regulatory power hold that the actual additional expenditure incurred by the Petitioner towards transportation of ash in terms of the MOEFCC Notification is admissible under "Change in Law" as additional O&M expenses. However, the admissibility of the claims is subject to prudence check of the following conditions on case to case basis for each station:*
> *a) Award of fly ash transportation contract through a transparent competitive bidding procedure. Alternatively, the schedule rates of the respective State Governments, as applicable for transportation of fly ash.*
> *b) Details of the actual additional expenditure incurred on Ash transportation after 25.1.2016, duly certified by auditors.*
> *c) Details of the Revenue generated from sale of fly ash/ fly ash products and the expenditure incurred towards Ash utilisation up to 25.1.2016 and from 25.1.2016 to till date, separately.*
> *d) Revenue generated from fly Ash sales maintained in a separate account as per the MoEF notification."*

72. The Petitioner has submitted that in terms of above, the actual ash transportation expenses incurred for the generating station in 2019-20 and 2020-21 after adjustment of the revenue from sale of ash is as under:

(Rs. in lakh)

Year	Ash sale fund as on 1.4.2019	Revenue from sale of ash	Ash fund available for meeting transportation expenses	Ash transportation expenses	Ash transportation met out of Ash sale fund	Ash transportation expenses to be recovered from beneficiaries
	A	**B**	**C = A+B**	**D**	**E = D (if C>=D) = C (if C<D)**	**F = 0 (if C>=D) = D-C (if C<D)**
2019-20	0.25	0.30	0.55	0.16	0.16	0.00
2020-21	0.39	0.00	0.39	2.57	0.39	7.12

73. The Petitioner has further submitted that ash transportation expenses are recurring in nature and if recovery of the same is allowed at the time of truing up would also attract carrying cost thereon and has accordingly, prayed Commission to allow reimbursement of above transportation charges for the year 2019-20 and 2020-21, subject to truing up. The Petitioner has also submitted that for balance tariff period 2021-24 billing and recovery of ash transportation expenditure may be allowed provisionally on monthly basis based on self-certification subject to truing up. The Petitioner has further added that the issue of monthly recovery and the procedure for recovery of costs is no more res-integra as this Commission in its order dated 22.3.2021 in Petition No. 405/MP/2019 (*GKEL & Anr. v. DHBVNL & Ors)* had devised a mechanism for the generator therein to recover future expenditure incurred on transportation of fly ash, wherein, the Commission has directed recovery of expenditure on transportation of fly ash on a monthly basis with reconciliation on an annual basis. The Petitioner has prayed that a similar procedure may also be made applicable in the case of the Petitioner.

74. We have examined the matter. The Petitioner has claimed an amount of Rs.712 lakh in 2020-21. However, on scrutiny of the data furnished by the Petitioner this

amount works out to Rs. 218 lakh in 2020-21. Further, Commission vide its order dated 5.11.2018 in Petition No. 172/MP/2016 had decided that the MOEF & CC Notification dated 25.1.2016 regarding the transportation of fly ash is a 'change in law' event and had disposed of the said Petition as under:

> *"31. Accordingly, we in exercise of the regulatory power hold that the actual additional expenditure incurred by the Petitioner towards transportation of ash in terms of the MOEFCC Notification is admissible under "Change in Law" as additional O&M expenses. However, the admissibility of the claims is subject to prudence check of the following conditions on case to case basis for each station:*
> *a) Award of fly ash transportation contract through a transparent competitive bidding procedure. Alternatively, the schedule rates of the respective State Governments, as applicable for transportation of fly ash.*
> *b) Details of the actual additional expenditure incurred on Ash transportation after 25.1.2016, duly certified by auditors.*
> *c) Details of the Revenue generated from sale of fly ash/ fly ash products and the expenditure incurred towards Ash utilisation up to 25.1.2016 and from 25.1.2016 to till date, separately.*
> *d) Revenue generated from fly Ash sales maintained in a separate account as per the MoEF notification."*

75. It is observed that the Commission vide its order dated 28.10.2022 in Petition 205/ MP/2021 filed by the Petitioner for recovery of additional expenditure incurred due to Ash transportation charges, consequent to MOEF &CC Notifications dated 3.11.2009 and 25.1.2016 on a recurring basis, had allowed the expenditure incurred for the years 2019-20, 2020-21 and 2021-22. The relevant portion of the order is as below:

> *"Petitioner has furnished the details of the distance to which fly ash has been transported from the generating station, schedule rates applicable for transportation of fly ash, as notified by the State Governments along with details, including Auditor certified accounts. These documents have been examined and accordingly, the total fly ash transportation expenditure allowed to the Petitioner generating station wise for the period 2019-22 is as per the table in para 38 above totalling to Rs.309704.03 lakh and the same shall be recovered from the beneficiaries of the respective generating stations in 6 (six) equal monthly instalments. However, the Petitioner is directed to submit details regarding award of transportation contracts, distance to which fly ash has been transported along with duly reconciled statements of expenditure incurred on ash transportation at the time of filing petitions for truing up of tariff for the 2019-24 tariff period of the generating stations."*

76. The issue of ash transportation expenses for this generating station including Vindhyachal Super Thermal Power Station, Stage- V has been dealt with and allowed

in the order dated 28.10.2022 in Petition No. 205/MP/2021 as per the actual expenses claimed by the Petitioner for the period from 2019-20 to 2021-22 after accounting for the revenue earned through sale of ash in the generating station. However, the Petitioner is directed to submit the details of the ash transportation expenses at time of filing of truing up of tariff, for the period 2019-24.

Operational norms

77. The Petitioner has considered following norms of operation, for the purpose of tariff, for the 2019-24 tariff period:

Normative Annual Plant Availability Factor (NAPAF) (%)	85
Heat Rate (kCal/kwh)	2401.56
Auxiliary Power Consumption (%)	7.36
Specific Oil Consumption (ml/kwh)	0.50

(a) Normative Annual Plant Availability Factor (NAPAF)

78. 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."

79. As the Petitioner has considered the NAPAF of 85%, in terms of Regulation 49(A)(a) of the 2019 Tariff Regulations, the same is allowed.

(b) Gross Station Heat Rate (kCal/kWh)

80. 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."

81. The Petitioner has claimed the Gross Station Heat Rate (GSHR) of 2401.56 Kcal/kWh considering the guaranteed turbine heat rate of 1932 Kcal/kWh and boiler efficiency of 84.47%. However, in terms of the third proviso to the said regulation quoted above, the boiler efficiency for Indian coal is to be considered as minimum 86%. Accordingly, the Gross Station Heat Rate has been reworked as 2358.84 Kcal/kWh and allowed.

(c) Specific Oil Consumption

82. 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"

83. As the Petitioner has considered the secondary fuel oil consumption of 0.50 ml/kWh, in terms of Regulation 49(D)(a) of the 2019 Tariff Regulations, the same is allowed.

(d) Auxiliary Power Consumption

84. 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."

85. As the Petitioner has considered auxiliary energy consumption of 6.25%, in terms of Regulation 49(E)(a) of the 2019 Tariff Regulations, the same is allowed.

86. Further, the Petitioner has considered an additional auxiliary consumption of 1.11% on account of FGD system, as allowed vide order dated 5.4.2023 in Petition 239/ GT/2020. It is observed that the auxiliary consumption on account of FGD was allowed on actuals, as there was no provision for auxiliary consumption on account of FGD in the 2014 Tariff regulations. However, the Commission has already notified the norms for additional auxiliary consumption on account FGD vide First Amendment to the 2019 Tariff Regulations. As per the provisions of these regulations, an additional auxiliary consumption of 1% is allowed on account of FGD, and accordingly the same has been considered. In view of the above, the normative Auxiliary Consumption considered for the purpose of ECR and working capital is 7.25% as against 7.36% claimed by the Petitioner.

<u>Interest on Working Capital</u>

87. 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."

<u>Fuel Cost and Energy Charges in Working Capital</u>

88. 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.

89. 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."*

90. 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.

91. Accordingly, the Petitioner has claimed ECR of Rs.1.651 per kWh and the following fuel cost component in working capital:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Cost of coal for 50 days	7541.79	7541.79	7541.79	7541.79	7541.79
Cost of secondary fuel oil for 2 months	156.89	156.47	156.47	156.47	156.89
Cost of Limestone for 50 days	132.19	132.19	132.19	132.19	132.19

92. 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 fuel received during these three months is only to be considered and no opening stock shall be included therein. Further, it is observed that the Petitioner has not submitted the Form-15 for limestone. Hence, for the present, the details of landed price, as submitted by the Petitioner, has been considered. However, the Petitioner is directed to submit Form 15 for limestone at the time of truing up of tariff. Accordingly, 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)	2231.09	2231.13
Weighted average GCV of coal (kCal/kg) *	3616.18	3616.19
Weighted average price of oil (Rs. /KL)	50432.01	50432.01
Weighted average GCV of oil (kCal/Ltr.)	9464.89	9464.89
Weighted Average Price of Limestone (Rs./MT)	1600	1600

* *Weighted average GCV of coal as received net of 85 kCal/kg.*

93. Accordingly, the fuel component in working capital, Energy charges and ECR claimed and allowed for the period 2019-24 is as under:

(Rs. in lakh)

	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 generation corresponding to NAPAF	7541.79		7407.47	
Cost of Limestone for 50 days	132.19		130.56	
Cost of secondary fuel oil for 2 months generation corresponding to NAPAF	156.89	156.47	156.89	156.47
Energy charges for 45 days generation corresponding to NAPAF	7022.33		6900.96	
ECR (Rs./kWh)	1.651		1.621	

94. 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

95. The Petitioner in Form-O has claimed the maintenance spares in the working capital as under:

(Rs. in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
2716.04	2816.78	2921.82	3031.28	3144.25

96. 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
2705.52	2790.65	2874.61	2969.78	3067.96

Working Capital for Receivables

97. 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	6900.96	6900.96	6900.96	6900.96	6900.96
Fixed Charges - for 45 days	7671.54	7691.70	7591.83	7483.38	7347.03
Total	**14572.50**	**14592.66**	**14492.79**	**14384.34**	**14248.00**

Working Capital for O&M Expenses (1 month)

98. The Petitioner in Form-O has claimed the O&M expenses for 1 month in the working capital as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
1131.68	1173.66	1217.43	1263.03	1310.10

99. 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:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
1127.30	1162.77	1197.75	1237.41	1278.32

Rate of Interest on Working Capital

100. 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 and 10.50% (i.e. 1-year SBI MCLR of 7.00% as on 01.04.2021 + 350 bps) for the period 2021-24. 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 generation corresponding to NAPAF) (A)	2962.99	2962.99	2962.99	2962.99	2962.99

Working Capital for Cost of Coal towards Generation – (30 days generation corresponding to NAPAF) (B)	4444.48	4444.48	4444.48	4444.48	4444.48
Working Capital for Cost of Limestone towards Stock- (20 days generation corresponding to NAPAF) (C)	52.22	52.22	52.22	52.22	52.22
Working Capital for Cost of Limestone towards Generation- (30 days generation corresponding to NAPAF) (D)	78.34	78.34	78.34	78.34	78.34
Working Capital for Cost of Secondary fuel oil - (2 months generation corresponding to NAPAF) (E)	156.89	156.47	156.47	156.47	156.89
Working Capital for Maintenance Spares @ 20% of O&M expenses (F)	2705.52	2790.65	2874.61	2969.78	3067.96
Working Capital for Receivables – (45 days of sale of electricity at NAPAF (G)	14572.50	14592.66	14492.79	14384.34	14248.00
Working Capital for O&M expenses - 1 month (H)	1127.30	1162.77	1197.75	1237.41	1278.32
Total Working Capital	**26100.25**	**26240.58**	**26259.66**	**26286.02**	**26289.20**
Rate of Interest	12.0500%	11.2500%	10.5000%	10.5000%	10.5000%
Interest on Working Capital	**3145.08**	**2952.06**	**2757.26**	**2760.03**	**2760.37**

Annual Fixed Charges

101. Accordingly, the annual fixed charges approved for the period 2019-24, for the generating station is summarized as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	16537.20	16815.48	16924.05	16931.25	16931.25
Interest on Loan	12181.53	11377.56	10125.93	8756.73	7322.92
Return on Equity	17003.76	17289.89	17397.89	17401.62	17401.52
Interest on Working Capital	3145.08	2952.06	2757.26	2760.03	2760.37
O&M Expenses	13527.62	13953.24	14373.05	14848.89	15339.82
Total	**62395.19**	**62388.23**	**61578.19**	**60698.53**	**59755.87**

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.*

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

Application Fee and Publication expenses

103. The Petitioner has sought reimbursement of fee paid by it for filing the petition for the period 2019-24 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.

104. 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.

105. Petition No. 415/GT/2020 is disposed of in terms of the above.

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