CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 417/GT/2020

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

Date of Order: 24th March, 2023

In the matter of:

Petition for approval of tariff of Simhadri Super Thermal Power Station, Stage-I (1000 MW) for the period 2019-24.

And

In the matter of

NTPC Limited,
NTPC Bhawan,
Core-7, Scope Complex,
7, Institutional Area, Lodhi Road,
New Delhi-110003. **.....Petitioner**

Vs

1. AP Eastern Power Distribution Company Limited,
   Corporate Office, P&T Colony, Seethammadhara,
   Visakhapatnam – 530 013 - (AP)

2. AP Southern Power Distribution Company Limited,
   Corporate Office, Back Side, Srinivasa Kalyana Mandapam,
   Tiruchhanur Road, Kesavayana Gunta,
   Tirupathi – 517 503 (AP)

3. Telangana State Northern Power Distribution Company Limited,
   H.No. 2-5-31/2, Vidyut Bhavan, Nakkalagutta, Hanamkonda,
   Warangal – 506 001 (AP)

4. Telangana State Southern Power Distribution Company Limited,
   Mint Compound, Corporate Office
   Hyderabad (AP) – 500 063 **...Respondents**

Parties Present:

Shri Venkatesh, Advocate, NTPC
Shri Anant Singh, Advocate, NTPC

Shri Rishabh Sehgal, Advocate, NTPC
Shri Isnain Muzamil, Advocate, NTPC
Shri A.S. Pandey, NTPC
Shri Harshit Sharma, NTPC

ORDER

This petition has been filed by the Petitioner, NTPC Limited for approval of tariff of Simhadri Super Thermal Power Station, Stage-I (1000 MW) (hereinafter referred to as 'the generating station') for the period 2019-24, in accordance with the provisions of the Central Electricity Regulatory Commission (Terms & Conditions of Tariff) Regulations, 2019 (hereinafter referred to as 'the 2019 Tariff Regulations').

2. The generating station with a capacity of 1000 MW, comprises of two units of 500 MW each. Unit-I of the generating station was declared under commercial operation (COD) on 1.9.2002 and Unit-II achieved COD on 1.3.2003. The Commission vide its order dated 22.2.2023 in Petition No. 292/GT/2020 had trued up the tariff of the generating station for the period 2014-19. Accordingly, the capital cost and annual fixed charges for the generating station are is as under:

Capital Cost allowed

(Rs. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost	353306.58	355841.21	356382.31	358861.72	363646.40
Add: Admitted Additional capital expenditure	2534.63	541.10	2479.42	4784.67	483.03
Closing Capital cost	**355841.21**	**356382.31**	**358861.72**	**363646.40**	**364129.42**
Average Capital cost	354573.89	356111.76	357622.01	361254.06	363887.91

Annual Fixed Charges allowed

(Rs. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	17839.43	10704.12	10815.00	11128.77	11394.34
Interest on Loan	3844.06	3445.36	3141.60	2881.16	2582.62
Return on Equity	20859.58	21051.55	21140.83	21355.53	21569.09
Interest on Working Capital	10610.97	10532.80	10574.30	10857.60	10950.74
O&M Expenses	16858.24	18127.36	19025.93	20156.85	21588.69
Compensation Allowance	200.00	200.00	200.00	200.00	500.00
Total	**70212.27**	**64061.19**	**64897.66**	**66579.92**	**68585.48**

Present Petition

3. The Petitioner, in the present Petition, has claimed capital cost and annual fixed charges for the generating station for the period 2019-24, as under:

Capital cost claimed

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Opening capital cost	365202.59	367469.59	376679.59	385516.59	388516.59
Add: Addition during the year/period	2267.00	9210.00	8837.00	3000.00	2500.00
Closing Capital Cost	**367469.59**	**376679.59**	**385516.59**	**388516.59**	**391016.59**
Average Capital Cost	366336.09	372074.59	381098.09	387016.59	389766.59

Annual Fixed Charges claimed

(Rs. in lakh)

Depreciation	11498.93	12172.28	13389.85	14329.29	**14859.27**
Interest on Loan	2258.23	2011.08	1806.71	1496.70	**1089.16**
Return on Equity	20641.57	20964.92	21473.35	21806.84	**21961.79**
Interest on Working Capital	8088.39	8147.15	8216.62	8279.47	**8330.26**
O&M Expenses	24735.36	25635.52	26571.05	27542.60	**28539.86**
Annual Fixed Charges	**67222.49**	**68930.94**	**71457.59**	**73454.89**	**74780.33**

4. The Petitioner has filed certain additional information vide affidavits dated 15.5.2021, 28.6.2021 and 24.6.2022. The Petition was heard at length on 28.7.2022 and the Commission vide Record of Proceedings (ROP) had directed the Petitioner, to submit certain additional information, after serving copies on the Respondents, and directing the parties to file their submissions. The Petitioner vide its affidavit dated 8.8.2022, has filed the additional information after serving copies to the Respondents. None of the Respondents have appeared in matter nor have they filed their replies in the matter. Taking into consideration the submissions and the documents available on record, we proceed to examine the claims of the Petitioner, on prudence check, 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 that 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;*
>
> *(c) Capital expenditure on account of ash disposal and utilization including handling and transportation facility;*
>
> *(d) 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 Petitioner vide Form-I(I) of the petition, has claimed capital cost as indicated in the table under paragraph 3 above. The Commission vide its order dated in Petition No. 292/GT/2020, had allowed the closing capital cost of Rs. lakh, as on 31.3.2019. Accordingly, in terms of Regulation 19(3) of the 2019 Tariff Regulations, the capital cost of Rs. 364129.42 lakh as on 31.3.2019 has been considered as the opening capital cost as on 1.4.2019, on cash basis, for the purpose of determination of tariff for the period 2019-24.

Additional Capital Expenditure

7. Regulations 25 and 26 of the 2019 Tariff Regulations provides that the application for determination of tariff shall be based on admitted capital cost, including any additional capital expenditure already admitted up to 31.3.2019 (either based on actual or projected additional capital expenditure) and estimated additional capital expenditure for the respective years of the period 2019- 24. Clauses (1) and (2) of Regulations 25 and Regulation 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 de-capitalisation 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 year-wise projected additional capital expenditure claimed by the Petitioner in respect of the generating station, for the period 2019-24, are as under:

(Rs. in lakh)

	Head of Works /Equipment's	**Regulations**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
1.	Ash related works	25(1)(c) & 25(1)(g)	0.00	0.00	0.00	3000.00	2500.00
2.	DAES Augmentation work	26(1)(b) & 26(1)(e)	1000.00	100.00	0.00	0.00	0.00
3.	Augmentation of Fire Fighting system in CHP	26(1)(b) & 26(1)(d)	260.00	33.00	0.00	0.00	0.00
4.	CCTV system for security of MP & township area	26(1)(b) & 26(1)(d)	200.00	0.00	0.00	0.00	0.00
5.	Development of sprinkler grid system to reuse the treated water	26(1)(b)	0.00	35.00	0.00	0.00	0.00
6.	Waste management related works	26(1)(b)	11.00	35.00	0.00	0.00	0.00
7.	Online Coal Analyser	26(1)(b)	373.00	0.00	0.00	0.00	0.00
8.	400Kv Transmission line differential	26(1)(b)	44.00	52.00	0.00	0.00	0.00

	Head of Works /Equipment's	Regulations	2019-20	2020-21	2021-22	2022-23	2023-24
	protection implementation (Simhadri-Gajuwaka and Simhadri-Kalpaka)						
9.	Township Boundary wall height raising	26(1)(b) & 26(1)(d)	0.00	150.00	30.00	0.00	0.00
10.	Fire wall for Lub oil store shed	26(1)(b) & 26(1)(d)	0.00	30.00	0.00	0.00	0.00
11.	Other capital works in ash disposal (Laying of cast Bassalt pipe)	25 (1) (c)	379.00	252.00	0.00	0.00	0.00
12.	FRP-IDCT	25(2)(b)	0.00	8000.00	8685.00	0.00	0.00
13.	Electro chlorination / CLO2 for replacement of Chlorine dosing system	26(1)(b) & 26(1)(d)	0.00	523.00	122.00	0.00	0.00
	Total Projected additional capital expenditure claimed		**2267.00**	**9210.00**	**8837.00**	**3000.00**	**2500.00**

(a) Ash related works

9. The Petitioner has projected additional capital expenditure of Rs. 3000.00 lakh in 2022-23 and Rs. 2500.00 lakh in 2023-24 towards Ash related expenses, under Regulation 25(1)(c) and Regulation 25(1)(g) of the 2019 Tariff Regulations. The Petitioner vide affidavit dated 24.6.2022 has submitted that the above-mentioned work will not be capitalized during the period 2019-24. In view of the submissions of the Petitioner, the additional capital expenditure claimed for the said asset, is **not allowed**.

(b) Dry Ash Evacuation System (DAES) Augmentation work

10. The Petitioner has claimed projected additional capital expenditure of Rs.1000 lakh in 2019-20 and Rs.100 lakh in 2020-21, towards DAES, under Regulation 26(1)(b) and Regulation 26(1)(e) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that Augmentation of DAES work, was allowed by the Commission vide its order dated 27.6.2016 in Petition No. 270/GT/2014, under the head 'change in law', but due to severe cyclone HUD- HUD, during the period 2014-19, the

said work was severely affected. It has further submitted that as the units are running continuously and based on the opportunity to execute the work, part work was capitalised during the period 2014-19, and the balance work is expected to be capitalised during the period 2019-24. It has also stated that the augmentation of DAES, is as per the MOEF directive dated 3.11.2009 for utilisation of ash.

11. As the additional capital expenditure claimed by the Petitioner is towards the work already admitted by order dated 27.6.2016, the same is **allowed**, as claimed by the Petitioner, under Regulation 26(1)(b) read with Regulation 26(1)(e) of the 2019 Tariff Regulations.

(c) Augmentation of Fire Fighting system in CHP

12. The Petitioner has claimed projected additional capital expenditure of Rs. 260 lakh in 2019-20 and Rs.33 lakh in 2020-21 towards Augmentation of Fire Fighting system in CHP, under Regulation 26(1)(b) and Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the work was allowed vide order dated 27.1.2017 in Petition No, 36/RP/2016 (in Petition No. 270/GT/2014) for recovery of the same during the period 2014-19. It has however submitted that due to delay in finalization of technical specifications and poor response from agency, the work could not be capitalized during the period 2014-19. The Petitioner has stated that the work is executed in compliance to the recommendations of the Central Industrial Security Force (CISF), Ministry of Home Affairs, GOI dated 15.7.2014 and the letter dated 3.10.2019.

13. The matter has been considered. It is observed that Commission vide its order dated 27.1.2017 in Petition No.36/RP/2016 had considered the additional capitalisation claim of the Petitioner as under:

"It is observed that the Commission in order dated 27.6.2016 while rejecting the claim of the petitioner under Regulation 14 (3) (iii) of the 2014 Tariff Regulations had observed that no documentary evidence was submitted by the petitioner to suggest that the letter from the Deputy Commandant, CISF was due to advice or direction from the appropriate government/ agency. It is however, noticed that the said regulation also provides for considering the expenditure for security or safety of the plant based on the advice or direction of statutory authorities responsible for national security/ internal security. The CISF is a statutory authority formed under CISF Act, 1968 and the said Act provides for the constitution and regulation of the armed forces of the union and the duties of which include doing any other act conducive to better protection and security of the industrial undertakings and the employees. In this background, the letter of the Deputy Commandant, CISF dated 15.7.2014 is for the safety and security of the plant and is required to be complied by the petitioner. Admittedly, this aspect was not considered by the Commission while passing the order dated 27.6.2016. To this extent, the order dated 27.6.2016 suffers from infirmity and the claim of the petitioner in compliance with the said letter of the Dy. Commandant, CISF fall within the scope of Regulation 14 (3)(iii) of the 2014 Tariff Regulations. Accordingly, we as a special case allow the prayer of the petitioner and direct the petitioner to recover the expenditure incurred over a period of 3 years i.e from 2016-17, 2017-18 and 2018-19. The relief so granted is applicable to the present case and cannot be considered as precedent in future. However, it is not clear as to whether the directions of the Dy. Commandant, CISF is in terms with the TAC guidelines established under the Insurance Act 1938 and whether the petitioner has obtained any discount from the insurance companies for augmentation of the fire fighting system in terms of the said guidelines. The petitioner shall place on record the compliance with TAC guidelines and the discount received from the insurance companies at the time of truing up of tariff of the generating station.

14. Thereafter, by order dated 24.1.2022 in Petition No. 418/GT/2020 (*approval of tariff of Simhadri STPS-II for 2019-24*) had, based on the above order allowed the projected additional capital expenditure claimed by the Petitioner therein. The relevant portion of the order dated 24.1.2022 is extracted below:

"21. In view of the above decision and considering the fact that the CEA Regulations mandate the requirement of the said work for higher security and safety of the plant, the projected additional capital expenditure claimed is allowed under Regulation 26(1)(d) of the 2019 Tariff Regulations. The Petitioner shall place on record the compliance with TAC guidelines and the discount received from the insurance companies at the time of truing up of tariff of the generating station. However, as the additional capital expenditure is being allowed beyond cut-off date, but not covered under original scope work or change in law, Return on Equity has been considered at the Weighted Average Rate of Interest (WAROI) in terms of Regulation 30(2) of the 2019 Tariff Regulations."

15. In line with the above decisions, the claim towards Augmentation of Fire Fighting system in CHP under Regulation 26(1)(d) of the 2019 Tariff Regulations is **allowed**. However, the Petitioner at the time of truing up shall comply with the directions of the contained in order dated 27.1.2017 in Petition No. 36/RP/2016 as above. The Petitioner

shall also furnish the reasons for variation in the expenditure if any, allowed in the said order and those actually incurred, at the time of truing-up of tariff. However, as the additional capital expenditure is being allowed beyond the cut-off date, but not covered under original scope work or change in law, Return on Equity has been considered at the Weighted Average Rate of Interest (WAROI) in terms of Regulation 30(2) of the 2019 Tariff Regulations.

(d) CCTV system for security of Main Plant & Township area

16. The Petitioner has claimed projected additional capital expenditure of Rs.200.00 lakh in 2019-20 towards CCTV system for security of Main Plant & Township area under Regulation 26(1)(b) and Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that CISF, Ministry of Home Affairs had directed the Petitioner to install CCTV system for enhanced security and safety of the generating station. It has also submitted that the additional capital expenditure incurred is related to project security, as per requirement/ recommendations of CISF, which is a statutory agency. Considering the fact that the assets/ works are necessary for the safety and security of the generating station in terms of the recommendations of the CISF, the additional capital expenditure claimed is **allowed** under Regulation 26(1)(b) and Regulation 26(1)(d) of the 2019 Tariff Regulations. Petitioner to submit the relevant documents at the time of truing-up of tariff.

(e) Development of sprinkler grid system to reuse the treated water

17. The Petitioner has claimed projected additional capital expenditure of Rs.35.00 lakh in 2020-21 for this item/asset, under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that the Andhra Pradesh Pollution Control Board (APPCB) has directed to use treated water of STP for

the purpose of gardening. It has submitted that the said work is to install the grid of sprinklers to use the STP treated water for the purpose of gardening. As the additional capital expenditure has been planned in compliance with the directions from APPCB, the same is **allowed** under Regulation 26(1)(b) of the 2019 Tariff Regulations. Petitioner to submit the relevant documents at the time of truing-up of tariff.

(f) Waste Management related works

18. The Petitioner has claimed projected additional capital expenditure of Rs.11.00 lakh in 2019-20 and Rs. 35.00 lakh in 2020-21, towards Waste management related works under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that these works are necessarily required for waste management in compliance of Solid Waste Management Rules, 2016 notified by Ministry of Environment, Forests and Climate Change (MoEF&CC), GOI. As per the said rules, the bio-degradable waste is required to be processed, treated and disposed of through composting or bio-methanation within the premises. The Petitioner has submitted that these works are related to organic waste composter, horticulture waste etc., and the rules are now applicable beyond municipal areas and have included industrial townships also.

19. The matter has been considered. As the additional capital expenditure to be incurred has been planned in terms of the Solid Waste Management Rules, 2016 notified by the MoEF&CC, GOI, the same is **allowed** under Regulation 26(1)(b) of the 2019 Tariff Regulations.

(g) Online Coal Analyser

20. The Petitioner has claimed projected additional capital expenditure of Rs.373.00 lakh towards Online Coal Analyser in 2019-20 under Regulation 26(1)(b) of the 2019

Tariff Regulations. In justification for the same, the Petitioner has submitted that MoEF vide OM dated 26.8.2015, has mandated all coal based thermal power plants with installed capacity of 100 MW and above located at a distance of 500 kms and above from coal source for sampling and analysis of coal and reporting of compliance in respect of use and supply of raw or blended coal with ash content not exceeding 34% ash content in coal. It is also been directed that real time monitoring using auto mechanical sampling (online) from moving stream of coal to be used for sampling fuels. The Petitioner has submitted that as the generating station is located at a distance of about 600-700 kms, from the linked mines and also due to source coal from other mines, under the flexible coal utilization scheme, it has to necessarily incur the expenditure, for installation of online coal analyzer, to comply with the directions of MoEF, GOI.

21. The submissions have been considered. It is observed that the MoEF&CC vide notification dated 26.8.2015 has mandated all coal based thermal power plants for sampling, analysis of coal and reporting of compliance in respect of use & supply of raw or blended or beneficiated coal with ash content not exceeding 34%. In this background and since the generating station is located at about 600-700 km from the linked mines, the projected additional capital expenditure claimed by the Petitioner is **allowed** under Regulation 26(1)(b) of the 2019 Tariff Regulations.

(h) 400Kv Transmission Line differential protection implementation (Simhadri-Gajuwaka and Simhadri-Kalpaka)

22. The Petitioner has claimed projected additional capital expenditure of Rs.96.00 lakh (Rs. 44.00 lakh in 2019-20 and Rs. 52.00 lakh in 2020-21) towards 400Kv Transmission Line differential protection implementation (Simhadri-Gajuwaka and Simhadri-Kalpaka),under Regulation 26(1)(b) of 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that in view of grid disturbance in Gujuwaka-

Simhadri-Kalpaka corridor, and in order to enhance security of the Grid, the Southern Region Power Committee (SRPC) directed the installation of the protection scheme, for safe and reliable operation of the grid. The Petitioner has stated that a meeting in this regard was held on 4.5.2016, with SRPC. It has further stated that the scheme is being implemented as per directions of SRPC, in terms of the provisions under Section 2(55) of the Electricity Act 2003.

23. The matter has been considered. It is observed that the additional capital expenditure has been incurred in compliance to directions from Southern Region Power Committee (SRPC), vide MoM dated 4.5.2016, in terms of Section 2(55) of the Act. In view of this, the projected additional capital expenditure claimed by the Petitioner is **allowed** under Regulation 26(1)(b) of 2019 Tariff Regulations. However, since the decapitalization amount has not been furnished by the Petitioner, the same is considered under assumed deletions. The Petitioner, shall, at the time of truing up of tariff, furnish the actual amount decapitalized for the said asset.

(i) Township boundary wall height raising on security requirement

24. The Petitioner has claimed projected additional capital expenditure of Rs.180.00 lakh (Rs. 150.00 lakh in 2020-21 and Rs. 30.00 lakh in 2021-22) towards Township boundary wall height raising on security requirement, under Regulation 26(1)(b) and Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that the expenditure is to be incurred in view of militants attack at Uri, the J&K army base. Accordingly, the Petitioner has submitted that CISF, Ministry of Home Affairs, has, vide letter dated 22.9.2016, directed the Petitioner to increase the boundary wall height in residential area of CISF Personnel, to improve the security & safety concerns. The Petitioner has also submitted that the additional capital

expenditure incurred is related to project security as per requirement/ recommendations of CISF, which is a statutory agency. Considering the fact that the assets/ works are necessary for the safety and security of the generating station in terms of the recommendations of the CISF, the additional capital expenditure claimed is **allowed** under Regulation 26(1)(d) of the 2019 Tariff Regulations.

(j) Fire wall for Lub oil store shed

25. The Petitioner has claimed projected additional capital expenditure of Rs.30.00 lakh in 2020-21 under Regulation 26(1)(b) and Regulation 26(1)(d) of 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the said work is in compliance to the recommendations of the CISF, Ministry of Home Affairs dated 3.10.2019. It has submitted that as per the communication from CISF, the Petitioner has been mandated to provide fire walls at Lub oil drum storage area. The Petitioner has further submitted that the Central Government vide its notification dated 23.10.2019 has directed the review of security of vital installations. Considering the fact that the additional capital expenditure incurred by the Petitioner, is related to project security, as per the recommendations of CISF, which is a statutory agency, and that the assets/ works are necessary for the safety and security of the generating station, the additional capital expenditure claimed is **allowed** under Regulation 26(1)(d) of the 2019 Tariff Regulations.

(k) Other capital works in ash disposal (Laying of cast basalt pipe)

26. The Petitioner has claimed projected additional capital expenditure of Rs.631.00 lakh (Rs.379.00 lakh in 2019-20 and Rs.252.00 in 2020-21) under Regulation 25(1)(c) of 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that the expenditure incurred is for procurement and erection of cast basalt pipe. It has also

submitted that these works are executed for disposal of ash, through cast basalt pipes, which have very less leakage /rupturing or maintenance. The Petitioner has further submitted that since the ash disposal lines pass through nearby villages, these works are necessary for the safety of the villagers and crops. It has added that the disposal lines pass near the 33 KV line and tripping incidences have taken place due to rupturing/leakage of ash disposal lines, but with the erection of cast basalt pipes, the 33 KV line can be operated safely.

27. The matter has been considered. In our view, the ash related works are continuous in nature during the entire operational lifetime of the generating station. Therefore, the additional capital expenditure claimed by the Petitioner is **allowed** under Regulation 25(1)(c) of 2019 Tariff Regulations. However, since the decapitalization amount has not been furnished by the Petitioner, the same is considered under assumed deletions. The Petitioner, shall, at the time of truing up of tariff, furnish the actual amount decapitalized for the said asset.

FRP-IDCT (Fibre Reinforced Plastic based Induce Draft Cooling Tower)

28. The Petitioner has claimed projected additional capital expenditure of Rs.16685.00 lakh (Rs.8000.00 lakh in 2020-21 and Rs.8685.00 in 2021-22) under Regulation 25(2)(b) read with Regulation 76 of 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the generating station, being a coastal project was designed to use sea water for cooling. It has stated that the NDCT (Natural Draft Cooling Tower) originally envisaged is under operation since 2002. The Petitioner has submitted that in view of corrosive nature of sea water and coastal atmosphere, and to protect and enhance the life of NDCT structure, 2000-micron PU coating, was provided on the concrete surface, which was coming in direct contact of sea water. The

Petitioner has, however submitted that despite all protective measures taken by it, spalling of concrete of shell structure was observed in NDCT and due to the deteriorating condition/health of the NDCTs, it was very unsafe for the maintenance personnel working. Accordingly, the Petitioner has submitted that in order to assess the condition, further assessment study was awarded to the Central Building Research Institute (CBRI), Roorkee in October, 2010, wherein, the CBRI in its report, recommended the following:

A) *Short term measures: Civil repair and rehabilitation of Cooling Towers including associated Structures like columns, beams, Staircase etc.;*

B) *Long term measures: Electrochemical techniques such as cathodic protection (CP) was recommended by CBRI as a long-term measure.*

29. CBRI in the said report has also indicated its apprehension on the effectiveness, service life, the high cost involved and availability of skilled manpower.

30. The Petitioner has stated that based on CBRI report/recommendation and its apprehensions on the cost effectiveness of the corrective measures, and also for sustainable and safe operation of the generating station, it was decided to install new IDCT (Fibre Reinforced Plastic based) instead of repairing the NDCT. The Petitioner has stated that IDCT has been awarded and it is expected that for one unit, the same shall be capitalised and would be in-operation during 2020-21 and IDCT for second unit shall come into operation in 2021-22. The Petitioner has therefore, requested to treat the replacement of NDCT with IDCT under Force Majeure conditions.

31. The Commission vide ROP of the hearing dated 28.7.2022, directed the Petitioner to submit the details of award as per LOA, the current status pertaining to the work of 2 No.(s) new FRP-IDCTs for Units-I and II (Rs. 166.85 crore claimed as additional capitalization in 2020-22) proposed to be commissioned in place of 2 No.(s) NDCT, including their de-capitalization value(s). In response, the Petitioner vide affidavit dated

8.8.2022, has submitted that the work of FRP-IDCTs for Units-I and II of the generating station, was awarded to M/s FANS, having its principal place of business at NA kvetnici 17, 14000 Prague-4 and has also furnished the notification of the said award. It has also stated that the work of new FRP-IDCTs for Units-I and II are going on at site.

32. We notice that due to deteriorating condition/health of the NDCTs, it has become unsafe for the maintenance personnel working at site. Keeping in view that the replacement of the asset/equipment is on account of early deterioration of asset, the additional capital expenditure as claimed by the Petitioner is **allowed** under Regulation 25(2)(a) in exercise of the power under Regulation 76 of 2019 Tariff Regulations. However, since the decapitalization amount has not been furnished by the Petitioner, the same is considered under assumed deletions. The Petitioner, shall, at the time of truing up of tariff, furnish the actual amount decapitalized for the said asset.

(l) CLO2 for replacement of Chlorine dosing System

33. The Petitioner has claimed projected additional capital expenditure of Rs.645.00 lakh (Rs.523.00 lakh in 2020-21 and Rs.122.00 in 2021-22) under Regulation 26(1)(b) and Regulation 26(1)(d) of 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that the CLO_2 Plant is being installed to enable a much safer way of producing CLO2 on site, by use of commercial grade HCl and sodium chlorite, instead of present practice of Chlorine gas, being dozed directly. It has stated that Chlorine gas is very hazardous and may prove fatal in case of leakage and handling & storage of same involves risk to the life of public at large and in the interest of public safety, the chlorine dozing system is now being replaced by CLO2 system, which is much safer and less hazardous than chlorine. The Petitioner has further submitted that at Kudgi project of the Petitioner, the Department of Factories, Boiler, Industrial Safety

and Health, Govt of Karnataka, has directed the Petitioner to consider the replacement of highly hazardous gas chlorination system with CLO_2 system. It has stat that the State Pollution Control Board, Odisha while issuing consent to establish in case of Darlipalli generating station had asked the Petitioner to explore the possibility of installing the CLO_2 system, instead of the Chlorine gas system. Accordingly, the Petitioner has stated that in view of safety of public, it has considered the replacement of the chlorination system with CLO_2 system.

34. The Petitioner vide affidavit dated 24.6.2022, has submitted that it has taken up the installation of CLO_2 Plant is in line with the provisions of "National Policy on Safety, Health and Environment at Workplace" released by the Ministry of Labour and Employment, GOI, in February, 2009 and as per the duties necessitated for safety of workplace and workmen in terms of Clause 6(1)(a) and 6(1)(d) of "The Occupational Safety, Health and Working Conditions Code, 2020" notified by Ministry of Law & Justice, GoI vide Gazette Notification dated 29.9.2020. The Petitioner has submitted that the installation of ClO_2 system was taken up in place of the earlier Chlorine dozing system, which is a change of process, taken up for the prevention and management of chemical accidents, in accordance with the various provisions and objectives of the "National Disaster Management Guidelines – Chemical Disasters" released by the NDMA, GOI in April, 2007.

35. The submissions have been considered. 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, in no manner, can be termed as a change in law event or for compliance with any existing law in respect of this generating station, warranting the capitalization of the additional 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 for the requirement of this item i.e. (chlorine dozing system to be replaced by Chlorine Dioxide (ClO_2) system) for safety and security of the generating station. In view of this, the projected additional capital expenditure claimed by the Petitioner is **not allowed**.

De-capitalization

36. The Petitioner has not furnished the de-capitalization value of assets. In response to the directions of the Commission vide ROP of the hearing dated 28.7.2022, to furnish the de-capitalization value(s), the Petitioner vide its affidavit dated 8.8.2022, has submitted that the decapitalization values shall be claimed at the time of truing up of tariff. In view of the submissions, the Petitioner is permitted to submit the same.

Assumed Deletion

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

38. The Petitioner has not submitted the decapitalization value of certain assets and has also not considered them under Assumed Deletions. Therefore, the methodology of arriving at the fair value of the de-capitalized asset, i.e. escalation rate of 5% per annum from the COD has been considered, in order to arrive at the gross value of old asset in comparison to the cost of new asset. In the present case, the year of COD of the generating station is 2002-03. We have considered the value of asset under consideration as on COD as 100 and escalated it @ 5% till the year during which additional capital expenditure is claimed against replacement of the same. The amount claimed for additional capital expenditure against the asset is multiplied by the derived ratio from above two values i.e., value in year of COD divided by value in capitalized year. As the Petitioner has not furnished the decapitalization value of differential protection system, ash disposal pipes and NDCT which was claimed and allowed as additional capital expenditure, the same is determined under 'Assumed Deletions' of the period 2019-24 as under:

(Rs. in lakh)

Name of the Asset	2019-20	2020-21	2021-22	2022-23	2023-24
Differential protection system	19.20	21.61	0.00	0.00	0.00
Ash disposal pipes/ cast basalt pipe	165.36	104.71	0.00	0.00	0.00
FRP-IDCT	0.00	3324.17	3436.95	0.00	0.00

39. Based on the above discussions, the total projected additional capital expenditure claimed by the Petitioner and those allowed for the period 2019-24, is summarized as under:

(Rs. in lakh)

Head of Work /Equipment		2019-20	2020-21	2021-22	2022-23	2023-24	Total
Ash related works	Claimed	0.00	0.00	0.00	3000.00	2500.00	5500.00
	Allowed	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
DAES Augmentation work	Claimed	1000.00	100.00	0.00	0.00	0.00	1100.00
	Allowed	**1000.00**	**100.00**	**0.00**	**0.00**	**0.00**	**1100.00**
	Claimed	260.00	33.00	0.00	0.00	0.00	293.00

Head of Work /Equipment		2019-20	2020-21	2021-22	2022-23	2023-24	Total
Augmentation of Fire Fighting system in CHP	**Allowed**	**260.00**	**33.00**	**0.00**	**0.00**	**0.00**	**293.00**
CCTV system for security of MP & township area	Claimed	200.00	0.00	0.00	0.00	0.00	200.00
	Allowed	**200.00**	**0.00**	**0.00**	**0.00**	**0.00**	**200.00**
Development of sprinkler grid system to reuse the treated water	Claimed	0.00	35.00	0.00	0.00	0.00	35.00
	Allowed	**0.00**	**35.00**	**0.00**	**0.00**	**0.00**	**35.00**
Waste management related works	Claimed	11.00	35.00	0.00	0.00	0.00	46.00
	Allowed	**11.00**	**35.00**	**0.00**	**0.00**	**0.00**	**46.00**
Online Coal Analyzer	Claimed	373.00	0.00	0.00	0.00	0.00	373.00
	Allowed	**373.00**	**0.00**	**0.00**	**0.00**	**0.00**	**373.00**
400Kv Trans. Line differential protection implementation (Simhadri-Gajuwaka and Simhadri-Kalpaka)	Claimed	44.00	52.00	0.00	0.00	0.00	96.00
	Allowed	**44.00**	**52.00**	**0.00**	**0.00**	**0.00**	**96.00**
Township Boundary wall height raising on security requirement	Claimed	0.00	150.00	30.00	0.00	0.00	180.00
	Allowed	**0.00**	**150.00**	**30.00**	**0.00**	**0.00**	**180.00**
Fire wall for Lub oil store shed	Claimed	0.00	30.00	0.00	0.00	0.00	30.00
	Allowed	**0.00**	**30.00**	**0.00**	**0.00**	**0.00**	**30.00**
Other capital works in ash disposal (Laying of cast bassalt pipe)	Claimed	379.00	252.00	0.00	0.00	0.00	631.00
	Allowed	**379.00**	**252.00**	**0.00**	**0.00**	**0.00**	**631.00**
FRP-IDCT	Claimed	0.00	8000.00	8685.00	0.00	0.00	16685.00
	Allowed	**0.00**	**8000.00**	**8685.00**	**0.00**	**0.00**	**16685.00**
Electro chlorination /CLO2 for replacement of Chlorine dosing System	Claimed	0.00	523.00	122.00	0.00	0.00	645.00
	Allowed	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal (A)	Claimed	2267.00	9210.00	8837.00	3000.00	2500.00	25814.00
	Allowed	**2267.00**	**8687.00**	**8715.00**	**0.00**	**0.00**	**19669.00**
De-capitalization/ Assumed Deletion (B)	Claimed	0.00	0.00	0.00	0.00	0.00	0.00
	Allowed	**184.55**	**3450.48**	**3436.95**	**0.00**	**0.00**	**7071.99**
Net Additional Capital Expenditure (D=A-B)	Claimed	2267.00	9210.00	8837.00	3000.00	2500.00	25814.00
	Allowed	**2082.45**	**5236.52**	**5278.05**	**0.00**	**0.00**	**12597.01**

Additional Capital Expenditure eligible for normal ROE:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Admitted projected additional capital expenditure **(A)**	2007.00	8654.00	8715.00	0.00	0.00	19376.00
Less: De-capitalization of assets **(B)**	184.55	3450.48	3436.95	0.00	0.00	7071.99
Net projected additional capital expenditure allowed (on cash basis) **(E) = (A-B-C+D)**	**1822.45**	**5203.52**	**5278.05**	**0.00**	**0.00**	**12304.01**

Additional Capital Expenditure eligible for WAROI ROE:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Admitted projected additional capital expenditure **(A)**	260.00	33.00	0.00	0.00	0.00	293.00
Less: De-capitalization of assets **(B)**	0.00	0.00	0.00	0.00	0.00	0.00
Net projected additional capital expenditure allowed (on cash basis) **(E) = (A-B-C+D)**	**260.00**	**33.00**	**0.00**	**0.00**	**0.00**	**293.00**

Capital cost allowed for the period 2019-24

40. As stated earlier, the closing capital cost of Rs. 364129.42 lakh as on 31.3.2019, as approved by order dated 22.2.2023 in Petition No. 292/GT/2020, has been considered as the opening capital cost, as on 1.4.2019. As such, the capital cost allowed for the period 2019-24 is as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Opening Capital Cost **(A)**	364129.42	366211.87	371448.39	376726.44	376726.44
Add: Admitted Additional capital expenditure **(B)**	2082.45	5236.52	5278.05	0.00	0.00
Closing Capital Cost **(C) = (A+B)**	**366211.87**	**371448.39**	**376726.44**	**376726.44**	**376726.44**
Average Capital cost (D) = (A+C)/2	365170.65	368830.13	374087.41	376726.44	376726.44

Debt-Equity Ratio

41. Regulation 18 of the 2019 Tariff Regulations provides as follows:

"18. Debt-Equity Ratio: (1) For new projects, 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 a 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 modernisation expenditure for life extension shall be serviced in the manner specified in clause (1) of this Regulation."

42. The Commission vide its order dated 22.2.2023 in Petition No. 292/GT/2020 had considered the gross loan and equity of Rs. 254890.60 lakh and Rs. 109238.83 lakh respectively, as on 31.3.2019. The proportionate equity, as a percentage of admitted capital cost, as on 31.3.2019, is 30%. Accordingly, the gross loan and equity amounting

to Rs. 254890.60 lakh and Rs. 109238.83 lakh, has been considered as gross loan and equity as on 1.4.2019. The debt-equity ratio for the admitted projected additional capital expenditure has been considered as 70:30. Accordingly, debt-equity is worked out as under:

(Rs. in lakh)

	Capital Cost as on 1.4.2019		**Net Additional Capitalization during 2019-24 period***		**Capital cost as on 31.3.2024**	
	Amount	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**
Debt (A)	254890.60	70.00%	8817.91	70.00%	263708.51	70.00%
Equity (B)	109238.83	30.00%	3779.10	30.00%	113017.93	30.00%
Total (C) = (A) + (B)	**364129.42**	**100.00%**	**12597.01**	**100.00%**	**376726.44**	**100.00%**

**Note: Debt-equity ratio has been calculated on Additional Capital Expenditure net of De-capitalization basis. However, Debt-equity ratio would be calculated on the basis of actual Additional Capital Expenditure and actual De-capitalization (based on original capitalization date) separately at the time of truing-up of 2019-24 tariff period.*

Return on Equity

43. Regulation 30 and Regulation 31 of the 2019 Tariff Regulations provide as follows:

"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 station, 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 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:

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;

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;

in case of a thermal generating station, with effect from 1.4.2020:rate of return on equity shall be reduced by 0.25% in case of failure to achieve the ramp rate of 1% per minute; 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."

"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.

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 a generating company or a 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 a transmission licensee paying normal corporate tax including surcharge and cess:

Estimated Gross Income from generation or transmission business for FY 2019-20 is Rs 1,000 crore;
Estimated Advance Tax for the year on above is Rs 240 crore;
Effective Tax Rate for the year 2019-20 = Rs 240 Crore/Rs 1000 Crore = 24%;
Rate of return on equity = 15.50/ (1-0.24) = 20.395%.

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 customers, as the case may be, on year to year basis."

44. As per proviso to Regulation 30 of the 2019 Tariff Regulations, ROE in respect of the additional capitalization, after the cut-off date, and beyond the original scope of work, excluding the 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. The additional capital expenditure within the original scope of work is calculated as per methodology provided in Regulations 30 and 31 of the 2019 Tariff Regulations. For equity base, ROE has been calculated by grossing up of ROE during the period 2019-24. The Petitioner has claimed tariff considering the rate of ROE as 18.782% i.e., base rate of 15.50% and MAT Rate of 17.472% (i.e., MAT Rate of 15% + Surcharge of 12% + HEC of 4%) for the period 2019-24.

45. The ROE for additional capital expenditure under the original scope of work, change in law etc. has been allowed at the normal rate, as claimed by the Petitioner. Accordingly, ROE, based on the admitted projected additional capital expenditure, is as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Normative Equity-Opening (A)	109238.83	109785.56	111346.62	112930.03	112930.03
Addition of Equity due to additional capital expenditure (B)	546.73	1561.05	1583.42	0.00	0.00
Normative Equity-Closing (C) = (A) + (B)	109785.56	111346.62	112930.03	112930.03	112930.03
Average Normative Equity (D) = (A+C)/2	109512.20	110566.09	112138.32	112930.03	112930.03
Return on Equity (Base Rate) (E)	15.500%	15.500%	15.500%	15.500%	15.500%
Effective Tax Rate (F)	17.472%	17.472%	17.472%	17.472%	17.472%
Rate of Return on Equity (Pre-Tax) (G) = (E)/(1-F)	18.782%	18.782%	18.782%	18.782%	18.782%
Return on Equity (Pre-Tax) annualised (H) = (D)x(G)	**20568.58**	**20766.52**	**21061.82**	**21210.52**	**21210.52**

46. The ROE in respect of admitted additional capitalization, after the cut-off date, and beyond the original scope of work, excluding the additional capitalization due to change in law, is allowed as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Normative Equity - Opening (A)	0.00	78.00	87.90	87.90	87.90
Addition of Equity due to additional capital expenditure (B)	78.00	9.90	0.00	0.00	0.00
Normative Equity-Closing (C) = (A) + (B)	78.00	87.90	87.90	87.90	87.90
Average Normative Equity (D) = (A+C)/2	39.00	82.95	87.90	87.90	87.90
Return on Equity (Base Rate) (E)	3.17%	3.17%	3.17%	3.16%	3.14%
Effective Tax Rate (F)	17.47%	17.47%	17.47%	17.47%	17.47%
Rate of Return on Equity (Pre-tax) (G) = (E)/(1-F)	3.84%	3.84%	3.84%	3.83%	3.81%
Return on Equity (Pre-tax) - (annualized) (H) =(D)x(G)	**1.50**	**3.18**	**3.37**	**3.37**	**3.35**

Interest on Loan

47. Regulation 32 of the 2019 Tariff Regulations provides as follows:

> *"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.*
>
> *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.*
>
> *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-capitalisation of such asset.*
>
> *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.*
>
> *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.*

The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.

The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing."

48. Interest on loan has been computed as under:

(i) The gross normative loan amounting to Rs. 254890.60 lakh as on 31.3.2019 as considered in order dated 22.2.2023 in Petition No. 292/GT/2020, has been retained, as on 1.4.2019;

(ii) Cumulative repayment amounting to Rs. 178938.28 lakh as on 31.3.2019 as considered in order dated 22.2.2023 in Petition No. 292/GT/2020, has been retained, as on 1.4.2019;

(iii) Accordingly, the net normative opening loan as on 1.4.2019 works out to be Rs. 75952.32 lakh;

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

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

(vi) The Petitioner has claimed interest on loan by applying the weighted average rate of interest 3.1652% for the year 2019-20, 3.1657% for the year 2020-21, 3.1662% for the year 2021-22, 3.1612% for the year 2022-23 and 3.1409% for the year 2023-24. The same has been considered for the purpose of tariff. The Petitioner, is directed to submit the documentary evidence for the rate of interest considered in Form-13 and the repayment schedule of loan, at the time of truing up of tariff.

49. Interest on loan has been worked out as follows:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Gross opening loan (A)	254890.60	256348.31	260013.87	263708.51	263708.51
Cumulative repayment of loan upto previous year (B)	178938.28	190257.86	199992.72	210767.31	224473.43
Net Loan Opening (C) = (A) - (B)	75952.32	66090.45	60021.15	52941.20	39235.07
Addition due to additional capital expenditure (D)	1457.71	3665.56	3694.64	0.00	0.00
Repayment of Loan during the period (E)	11434.25	11878.80	12910.13	13706.12	13706.12
Less: Repayment adjustment on a/c of de-capitalization (F)	114.67	2143.94	2135.53	0.00	0.00
Net Repayment of Loan during the period (G) = (E) - (F)	11319.58	9734.86	10774.59	13706.12	13706.12

	2019-20	2020-21	2021-22	2022-23	2023-24
Net Loan Closing (H) =(C) +(D) -(G)	66090.45	60021.15	52941.20	39235.07	25528.95
Average Loan (I) = (C+H)/2	71021.39	63055.80	56481.18	46088.14	32382.01
Weighted Average Rate of Interest on loan (J)	3.1652%	3.1657%	3.1662%	3.1612%	3.1409%
Interest on Loan (K) = (I)*(J)	**2247.97**	**1996.16**	**1788.31**	**1456.94**	**1017.09**

<u>Depreciation</u>

50. Regulation 33 of the 2019 Tariff Regulations provides as follows:

"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.

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.

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.

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.

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.*

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.

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.

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."

51. Cumulative depreciation amounting to Rs. 222533.65 lakh, as on 31.3.2019, as considered in order dated 22.2.2023 in Petition No. 292/GT/2020, has been considered for the purpose of tariff. Accordingly, the balance depreciable value (before providing depreciation) for 2019-20 works out to Rs. 99096.86 lakh. Since, as on 1.4.2019, the used life of the generating station is 16.33 years, which is more than 12 years from the effective station COD of 30.11.2002, depreciation has been spread over the remaining useful life of the asset for the period 2019-24. Accordingly, depreciation has been worked out and allowed as follows:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Average Capital Cost (A)	365170.65	368830.13	374087.41	376726.44	376726.44
Value of freehold land included in average capital cost (B)	7803.42	7803.42	7803.42	7803.42	7803.42
Value of software and IT equipment included in average capital cost (C)	0.00	0.00	0.00	0.00	0.00
Aggregated Depreciable Value (D)= (A-B-C)x90%+ (C)	321630.51	324924.04	329655.59	332030.72	332030.72
Remaining aggregate depreciable value at the beginning of the year (E) = (D) - (Cumulative Depreciation (shown at J), at the end of the previous year)	99096.86	91070.81	86067.50	77668.03	63961.91
No. of completed years at the beginning of the year (F)	16.33	17.33	18.33	19.33	20.33
Balance useful life at the beginning of the year (G) = 25 - (F)	8.67	7.67	6.67	5.67	4.67

	2019-20	2020-21	2021-22	2022-23	2023-24
Combined Depreciation during the year/ period (G) = (D) / (F)	**11434.25**	**11878.80**	**12910.13**	**13706.12**	**13706.12**
Cumulative depreciation at the end of the year (before adjustment for de-capitalization) (H) = (G) + (Cumulative Depreciation (shown at J), at the end of the previous year)	233967.90	245732.03	256498.21	268068.81	281774.93
Less: Depreciation adjustment on account of de-capitalization (I)	114.67	2143.94	2135.53	0.00	0.00
Cumulative depreciation at the end of the year (J) = (H) - (I)	**233853.23**	**243588.09**	**254362.68**	**268068.81**	**281774.93**

O&M Expenses

52. Regulation 35(1)(1) of the 2019 Tariff Regulations provides as follows:

"(35)(1) Thermal Generating Station: Normative Operation and Maintenance expenses of thermal generating stations shall be as follows:

(1) Coal based and lignite fired (including those based on Circulating Fluidised Bed Combustion (CFBC) technology) generating stations, other than the generating stations or units referred to in clauses (2), (4) and (5) of this Regulation:

(Rs in lakh/MW)

Year	200/210/ 250 MW Series	300/ 330/ 350 MW Series	500 MW Series	600 MW Series	800 MW Series and above
FY 2019-20	32.96	27.74	22.51	20.26	18.23
FY 2020-21	34.12	28.71	23.30	20.97	18.87
FY 2021-22	35.31	29.72	24.12	21.71	19.54
FY 2022-23	36.56	30.76	24.97	22.47	20.22
FY 2023-24	37.84	31.84	25.84	23.26	20.93

Provided that where the date of commercial operation of any additional unit(s)of a generating station after first four units occurs on or after 1.4.2019, the O&M expenses of such additional unit(s) shall be admissible at 90% of the operation and maintenance expenses as specified above;

xxx

Provided also that operation and maintenance expenses of generating station having unit size of less than 200 MW not covered above shall be determined on case-to-case basis.

53. The Petitioner has claimed normative O&M expenses, in Form 3A, as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
22510.00	23300.00	24120.00	24970.00	25840.00

54. As the normative O&M expenses claimed by the Petitioner is in terms of Regulation 35(1)(1) of the 2019 Tariff Regulations, the same is allowed for the period 2019-24.

Water Charges

55. The first proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations provides as under:

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

56. The actual water charges claimed by the Petitioner and allowed by order dated 22.2.2023 in Petition No. 292/GT/2020 for the period 2014-19 is as under:

(Rs.in lakh)

2014-15	2015-16	2016-17	2017-18	2018-19
724.09	813.68	688.47	768.31	840.39

57. In terms of the first proviso to Regulations 35(1)(6) of the 2019 Tariff Regulations, water charges shall be allowed separately, based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check. The details furnished by the Petitioner in respect of water charges applicable for 2019-20 is as under:

Description	Remarks
Type of Plant	Coal Based
Type of cooling water system	NDCT/ IDCT (as per above para)
Consumption of Water	Sea water: 45.465 MCM Sweet water: 4.622 MCM
Rate of Water charges	Sea water: 5 Paisa/KL Sweet water: Rs. 16.60/KL for FY 2019-20 with escalation of 5 % every year Other charges may also be payable as per agreement
Total Water Charges	Yearly details as per Form-3A of Appendix-I

58. Accordingly, the Petitioner has claimed the water charges for 2019-24 tariff period as follows:

(Rs.in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
882.00	925.00	970.00	1017.50	1067.00

59. Further, the Petitioner vide affidavit dated 28.6.2021 has stated that the actual water charges incurred for the generating station is Rs. 708.26 lakh in 2019-20 and Rs. 520.52 lakh in 2020-21. Accordingly, the actual water charges incurred for Rs. 708.26 lakh in 2019-20 and Rs. 520.52 lakh in 2020-21 are allowed. For the remaining period i.e. 2021-24, we allow the water charges of Rs.520.52 lakh, as incurred during 2020-21). However, the Petitioner, at the time of truing up of tariff, shall furnish the details of the actual water consumption (in cubic meters), rate (Rs/ Cubic meter), water consumption in cubic meters per MW and power charges separately. The water charges allowed as under, are subject to the truing up, as per actual water charges paid, and after prudence check.

(Rs.in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
708.26	520.52	520.52	520.52	520.52

60. Further, the Petitioner at the time of truing up, shall furnish the details of actual water consumption along with the clarification and declaration that the same is not being used for colony consumption. In case yes, the Petitioner shall furnish the bifurcation of total quantum of water supplied to the plant and colony along with relevant costs.

Security Expenses

61. The second proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations provides as under:

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

xxx

Provided further that the generating station shall submit the assessment of the security requirement and estimated expenses;

xxxxx;

62. The Petitioner has claimed total security expenses of Rs. 7422.89 lakh (i.e. Rs. 1343.36 lakh in 2019-20, Rs. 1410.52 lakh in 2020-21, Rs. 1481.05 lakh in 2021-22, Rs.1555.10 lakh in 2022-23 and Rs. 1632.86 lakh in 2023-24) in terms of the second proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations. The Petitioner vide affidavit dated 28.6.2021, has submitted that the actual Security expenses incurred at Simhadri Station (2000 MW) during 2018-19 was Rs 2469.76 lakh and out of this, the share of this generating station, works out as Rs 1234.88 lakh, (on pro rata basis of the installed capacity). It has further submitted that the actual security expenses incurred at Simhadri generating station during the years 2019-20 and 2020-21 is Rs 2710.14 lakh and 3691.61 lakh respectively. Out of this, the proportionate share for this generating station, works out as Rs 1355.07 lakh and Rs 1845.81 lakh for the years 2019-20 and 2020-21 respectively, based on the installed capacity (in MW).

63. We have examined the matter. The Petitioner has claimed actual security expenses for the generating station for the years 2019-20 and 2020-21 and has also claimed projected security expenses for the period from 2021-24. It is however observed that the actual security expenditure submitted by the Petitioner, during the year 2020-21 is higher by 36.22%, as compared to the year 2019-20. The Petitioner has also not furnished the assessment of security requirement, as per the second proviso to the said regulations. In view of this, 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. However, the actual security expenses incurred for the period 2019-21 and the projected security expenses for the period 2021-24, has been considered for the

purpose of tariff with escalation of 5% as claimed by the petitioner from 2021-22 onwards. Accordingly, the security expenses claimed and allowed, for the generating station for the period 2019-24 is as under:

(Rs.in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
1355.07	1845.81	1481.05	1555.10	1632.86

Capital spares

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

62. Accordingly, the total O&M expenses, including Water charges and Security expenses, claimed, and allowed for the period 2019-24 is summarized below:

(Rs. in lakh)

		2019-20	2020-21	2021-22	2022-23	2023-24
Installed Capacity (MW) (A)		1000.00	1000.00	1000.00	1000.00	1000.00
O&M Expenses under Reg.35(1) in Rs lakh / MW (B)	Claimed	22.51	23.30	24.12	24.97	25.84
	Allowed	22.51	23.30	24.12	24.97	25.84
Total O&M Expenses (in Rs lakh) (C) = (A)*(B)	Claimed	22510.00	23300.00	24120.00	24970.00	25840.00
	Allowed	22510.00	23300.00	24120.00	24970.00	25840.00
Water Charges (in Rs lakh) (D)	Claimed	882.00	925.00	970.00	1017.50	1067.00
	Allowed	708.26	520.52	520.52	520.52	520.52
Security Expenses (in Rs lakh) (E)	Claimed	1343.36	1410.52	1481.05	1555.10	1632.86
	Allowed	1355.07	1845.81	1481.05	1555.10	1632.86
Total O&M Expenses as allowed (including Water Charges and Capital Spares Consumed) (F) = (C+D+E)	Claimed	24735.36	25635.52	26571.05	27542.60	28539.86
	Allowed	**24573.33**	**25666.33**	**26121.57**	**27045.62**	**27993.38**

Ash Transportation charges

63. The Petitioner has claimed recovery of additional expenditure for Rs. 7563.80 lakh in 2019-20 and Rs. 3707.70 lakh in 2020-21 towards ash transportation charges from the beneficiaries, after adjusting the revenue earned from sale of ash. It is pertinent to mention that in Petition No. 205/MP/2021, filed by the Petitioner for recovery of additional expenditure incurred due to Ash transportation charges for the period 2019-24, consequent to MOEF&CC, GOI Notification dated 3.11.2009 and Notification dated 25.1.2016, on a recurring basis, the Commission vide its order dated 28.10.2022, had disposed of the said petition, after allowing the expenditure in respect of the generating stations of the Petitioner for the period 2019-24, as under:

> *"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."*

64. In view of the above, the claim of the Petitioner for ash transportation charges, in respect of this generating station, for the period 2019-24, has not been considered in this order and shall be guided by the decision in our order dated 28.10.2022 in Petition No.205/MP/2021.

Additional Expenditure on Emission Control System

65. The Petitioner has submitted that it is in the process of installing the Emission Control Systems (ECS) for this generating station in compliance to the revised emission standards as notified by the Ministry of Environment and Forests and Climate Change

(MOEF&CC) vide notification dated 7.12.2015, as amended. It is however, noticed that the Petitioner had filed Petition No. 467/MP/2019, for approval of additional expenditure on installation of various Emission Control Systems for this generating station, in compliance to the MOEF&CC notification dated 7.12.2015 and the Commission by a common order dated 30.9.2021, had disposed of the said petition, with certain observations. Therefore, the claim of the Petitioner has not been considered in this order, and shall be guided by the decision in the order dated 30.9.2021.

<u>Operational Norms</u>

66. The operational norms considered by the Petitioner in Form-3 is as under:

	2019-20	2020-21	2021-22	2022-23	2023-24
Normative Annual Plant Availability Factor (NAPAF) %	85.00	85.00	85.00	85.00	85.00
Gross Station Heat Rate (kcal/kwh)	2390.00	2390.00	2390.00	2390.00	2390.00
Auxiliary Power Consumption %	6.30%	6.43%	6.68%	6.80%	6.80%
Specific Oil Consumption (ml/kwh)	0.50	0.50	0.50	0.50	0.50

(a) Normative Annual Plant Availability Factor

67. Regulation 49 of the 2019 Tariff Regulations provides as follows:

> *(A) Normative Annual Plant Availability Factor (NAPAF)*
> *(a) For all thermal generating stations, except those covered under clauses (b), (c), (d), & (e) - 85%.*

68. Since the Petitioner has considered NAPAF of 85% for the period 2019-24, in terms of the above regulation, the same is allowed..

(b) Station Heat Rate

69. Regulation 49(C)(a)(i) of the 2019 Tariff Regulations provides as follows:

> *"(C) Gross Station Heat Rate: (a) Existing Thermal Generating Stations (i) For existing Coal-based Thermal Generating Stations, other than those covered under clauses (ii) and (iii) below:*

200/210/250 MW Sets	***500 MW Sets (Sub-critical)***
2,430kCal/kWh	*2,390kCal/kWh*

70. As the Petitioner has considered the Gross Station Heat Rate of 2390.00 kCal/ kWh, in terms of the above regulations, the same is allowed.

(c) Auxiliary Power Consumption:

71. Regulation 49(E)(a)(ii) of the 2019 Tariff Regulations provides for Auxiliary Power Consumption as follows:

> *"49(E) Auxiliary Energy Consumption*
>
> *(a) Coal-based generating stations except at (b) below:*

	With Natural Draft cooling tower or without cooling tower
(i) 200 MW series	*8.5%*
(ii) 300 MW and above	
Steam driven boiler feed pumps	*5.75%*
Electrically driven boiler feed pumps	*8.0%*

> *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:*

72. The Auxiliary Power Consumption (APC) of 5.75% as per Regulation 49(E)(a)(ii) of the 2019 Tariff Regulations, is applicable to the generating station. However, the Petitioner has claimed relaxation in APC due to following reasons:

a. The generating station is a coastal power station and sea water is being used for the purpose of cooling in condenser, Auxiliary cooling water and Ash handling system as per design instead of river water (sweet water). The Auxiliary energy consumption norm for 500 MW units is fixed at 5.75% (>85% Loading factor (LF)) as per Tariff norms for the 2019-24 tariff period. This norm is applicable to all 500 MW stations with NDCTs for both coastal based and river water-based power stations.

b. Due to usage of sea water APC of the generating station is much higher than the norms provided by the Regulations. The following factors contribute towards increasing APC for power plants using sea water over the river water-based power plants:

    i. SP Gravity of Seawater: (around 2.5% higher than that of River water) – Requires more pumping power;

    ii. Cycles of Concentration (COC) : 1.5 (instead of 3.0 for river water based systems) : Requires more blow down and more make up;

c. The system wise additional pumping power (with sea water) required for the generating station at 85 % load factor (LF) in comparison to river water-based stations is tabulated below:

	System	Additional Power (MW)
1	Cooling Water System	1.055
2	Ash Handling System	0.0319
3	Auxiliary Cooling Water System	0.0102
	Total	1.0971
	Impact on APC (%) at 85% LF	0.13

d. The impact on APC due to usage of sea water on the generating station is computed as 0.13% at 85% LF. This impact at part loads is envisaged to be more than the above figure.

e. Further, the recent changes in regime of operation of power sector are influencing the actual APC of the generating station due to Partial loading and lowering of technical minimum load and SCED implementation. Under the above regime of Operation, Schedule Generation (SG) is being revised around 150 times in a day for the generating station. Almost for the 50% of time, the generating station is running at technical minimum loads (55% to 65%). To cope up with the above changes in grid operation, it becomes necessary to keep all the 4 Cooling Water (CW) pumps in operation per stage and also keep one additional mill in spinning at loads less than 85% to meet the immediate revisions of SG. The approximate impact comes to 0.1% in APC. This is more evident from the operating data during the year 2019-20 till August, 2019 as tabulated below:

LF (%)	APC Actual (%)	APC with Compensation (%)	Gap from Tariff (%)
	A	B	A-B
71.91	6.95	6.40	0.55

73. Accordingly, the Petitioner has claimed APC as under:

2019-20	2020-21	2021-22	2022-23	2023-24
6.30%	6.43%	6.68%	6.80%	6.80%

74. The submission has been considered. It is observed that the Commission vide its order dated 11.1.2022 in Petition No. 293/GT/2020, while approving the normative APC of 5.25% for the period 2014-19, had rejected the Petitioner's claim for additional APC, as under:

"The submissions have been considered. As per Dispensation provided in DOP of IEGC dated 5.5.2017 on compensation mechanism for ISGS station on account of degradation of SHR and increase in AEC due to part loading, a separate compensation is payable by the beneficiaries. As per the data furnished by the Petitioner, it is observed that AEC has increased abruptly only during the years 2017-18 and 2018-19, which could also be due to lower loading factors in that period. Hence, the Petitioner's claim for additional AEC above the normative of 5.25% cannot be understood only on account of utilization of sea water. The detailed calculation of AEC after compensation has not been submitted by the Petitioner. Therefore, the prayer of the Petitioner to relax the provisions of AEC in exercise of the power under Regulation 54 power to relax of the 2014 Tariff Regulations is rejected. Further, the Petitioner has considered the same AEC as approved by the Commission in its order dated 29.7.2016 in Petition No. 294/GT/2014 in accordance with the Regulation 36(E)(a) of the 2014 Tariff Regulations. Therefore, the same AEC, as approved by the Commission vide its order dated 29.7.2016 in Petition No. 294/GT/2014 has been considered."

75. In view of the above, the claim of the Petitioner for approval of additional auxiliary energy consumption is not allowed. The generating station comprises of two units of 500 MW each, and with a Natural Draft Cooling Tower, qualifies for normative APC of 5.75% for the period 2019-24. This has been considered for the computation of energy charges for the period 2019-24.

(d) Specific Oil Consumption

76. Regulation 49(D)(a) of 2019 Tariff Regulations, provides for Secondary fuel oil consumption of 0.50 ml/kWh, for coal-based generating stations. As the Secondary fuel oil consumption considered by the Petitioner is as per the above said regulations, the same is allowed for the period 2019-24.

77. Based on the above, the operational norms considered for the generating station for the period 2019-24 are as under:

Normative Annual Plant Availability Factor (NAPAF) (%)	85
Heat Rate (kCal/kWh)	2390.00
Auxiliary Power Consumption (%)	5.75%
Specific Oil Consumption (ml/kWh)	0.50

Interest on Working Capital

78. Regulation 34 the 2019 Tariff Regulations provides as follows:

*"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."

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

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

"(3) Rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2019 or as on 1st April of the year during the tariff period 2019-24 in which the generating station or a unit thereof or the transmission system including communication system or element thereof, as the case may be, is declared under commercial operation, whichever is later:

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

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

Fuel Cost for computation of working capital

79. The Petitioner has claimed ECR and fuel components in working capital as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
ECR (Rs./kWh)	2.8527	2.8565	2.8642	2.8680	2.8680

Cost of coal for 50 days	27049.50	27049.50	27049.50	27049.50	27049.50
Cost of Secondary fuel oil 2 months	262.48	261.76	261.76	261.76	262.48

80. The Petitioner has claimed fuel component cost in working capital and ECR based on:

a) Operational norms as per 2019 Tariff Regulations.
b) Price and "as received" GCV of coal {after reducing the same by 85 kcal/kWh in terms of Regulation 43(2)(b)} procured for the three months of October 2018, November 2018, and December 2018, and
c) Price and GCV of secondary fuel oil for the three months of October 2018, November 2018, and December 2018.

81. The Commission vide ROP of the hearing dated 28.7.2022, directed the Petitioner to submit Form-15, including the opening quantity of fuel, and the value of stock. The Petitioner vide affidavit dated 8.8.2022 has submitted audited revised Form-15, indicating the opening stock of coal and coal received during the months of October, November, and December 2018, separately.

82. On perusal of the data furnished by the Petitioner, it is observed that while computing the landed cost of fuel, the Petitioner has considered the opening stock of coal for the months of October 2018, November 2018, and December 2018 (closing stock of the coal for the previous months). However, in terms of the Regulation 39 of the 2019 Tariff Regulations, the computation of ECR and associated fuel components in interest on working capital, is based on the landed price and GCV of fuel, which means that the fuel received during the specified three months (October 2018, November 2018, and December 2018) is only to be considered, without opening stock. Accordingly, the normative cost of coal for stock of 50 days and Normative Transit and Handling loss of 0.80%, has been considered for calculation of working capital requirements After excluding the opening stock value, we have worked out the weighted

average landed cost and weighted average GCV of coal for working out the fuel components in working capital for the months of October 2018, November 2018 and December 2018 as under:

	October, 2018	November, 2018	December, 2018
Claimed (Rs/kg)	3346.00	3437.00	3585.00
Allowed (Rs/kg)	3346.00	3437.00	3585.00

83. The revised GCV is further reduced by a margin of 85 kcal/Kg towards storage losses and the revised price of landed cost of coal and GCV of oil as furnished, has been considered. The Fuel components in working capital allowed are as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Cost of Coal for stock (20 days generation corresponding to NAPAF)	10835.65	10835.65	10835.65	10835.65	10835.65
Advance towards cost of Coal for generation (30 days generation corresponding to NAPAF)	16253.48	16253.48	16253.48	16253.48	16253.48
Cost of Secondary fuel (2 Months generation corresponding to NAPAF)	312.28	311.42	311.42	311.42	312.28

<u>Energy Charge Rate (ECR)</u>

84. The Petitioner has claimed ECR (ex-bus), based on the weighted average price, GCV of coal & oil procured and burnt for the preceding months of October 2018, November 2018, and December 2018 as under:

	2019-20	2020-21	2021-22	2022-23	2023-24
ECR (Rs./kWh)	2.8527	2.8565	2.8642	2.8680	2.8680

85. The ECR, as worked out, based on the operational norms specified under the 2019 Regulations and on "as received" GCV of coal for the preceding three months i.e., October 2018 to December 2018, has been considered for allowing two months of energy charge in working capital as under:

	Unit	2019-24
Capacity	MW	1000.00
Gross Station Heat Rate	Kcal/kWh	2390.000
Auxiliary Energy Consumption	%	5.750%
Weighted average GCV of oil	Kcal/lit	9850.00

	Unit	2019-24
Weighted average GCV of coal	Kcal/kg	3371.00
Weighted average price of oil	Rs/KL	50188.94
Weighted average price of Coal	Rs/kg	3753.63
Rate of energy charge ex-bus	Rs/kWh	2.844

Working capital for O&M Expenses (1 month)

86. O&M expenses for 1 month, claimed by the Petitioner for the purpose of working capital (including water charges and security expenses) is as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
2061.28	2136.29	2214.25	2295.22	2378.32

87. Regulation 34(1)(a)(vi) of the 2019 Tariff Regulations provides for O&M expenses including water charges and security expenses for one month. Accordingly, the O&M expenses (1 month) component of working capital is allowed as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
2047.78	2138.86	2176.80	2253.80	2332.78

Working capital for Maintenance Spares

88. Regulation 34(1)(a)(iv) of the 2019 Tariff Regulations provides for Maintenance spares @ 20% of the O&M expenses, including water charges and security expenses. Accordingly, maintenance spares have been allowed as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
4914.67	5133.27	5224.31	5409.12	5598.68

89. The difference between the O&M expenses for 1 month' and Maintenance spares claimed by the Petitioner and those allowed as above, is only on account variation in water charges and security expenses claimed by the Petitioner and those allowed in this order.

Working capital for Receivables

90. Regulation 34(1)(a)(v) of the 2019 Tariff Regulations provides for Receivables for

45 days. Accordingly, after taking into account the mode of operation of the generating station on secondary fuel, the Receivable component of working capital is allowed as follows:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Energy charge for 45 days corresponding to NAPAF) (pit or non-pit) (A)	24606.71	24606.71	24606.71	24606.71	24606.71
Fixed charge for 45 days corresponding to NAPAF) (pit or non-pit) (A)	8228.25	8373.94	8508.88	8704.34	8747.03
Total	**32834.96**	**32980.66**	**33115.60**	**33311.06**	**33353.75**

91. As per Regulation 34(2) of 2019 Tariff Regulations, the cost of coal shall be based on landed fuel cost (taking into account normative transit and handling losses in terms of Regulation 39 of the 2019 Tariff Regulations and gross calorific value of fuel as per actual weighted average for the third quarter of preceding financial year. Hence, the Petitioner is directed to furnish the details of quantity of coal as per Regulation 34(2) of the 2019 Tariff Regulations at the time of truing up of tariff. The Petitioner is also directed to submit the details strictly as provided in Forms/ Annexures attached to the 2019 Tariff Regulations.

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

Rate of Interest on working capital

93. In accordance with 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 1.4.2019 +350 bps) for the year 2019-20, 11.25% (i.e.1 year SBI MCLR of 7.75% as on 1.4.2020 + 350 bps) for the year 2020-21 and 10.50% (i.e. 1 year SBI MCLR of

7.00% as on 1.4.2021 + 350 bps) for the period 2021-24. Accordingly, Interest on working capital is allowed as under:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Working Capital for Cost of Coal for Stock (10 days or 20 days generation corresponding to NAPAF) (pit or non-pit) (A)	10835.65	10835.65	10835.65	10835.65	10835.65
Working Capital for Cost of Coal (30 days generation corresponding to NAPAF) (B)	16253.48	16253.48	16253.48	16253.48	16253.48
Working capital for Cost of Oil (2 Months generation corresponding to NAPAF) (C)	312.28	311.42	311.42	311.42	312.28
Working Capital for O&M expenses (1 month of O&M Expenses) (D)	2047.78	2138.86	2176.80	2253.80	2332.78
Working Capital for Maintenance Spares (20% of Annual O&M Expenses) (E)	4914.67	5133.27	5224.31	5409.12	5598.68
Working Capital for Receivables (45 Days of Sale of Electricity at NAPAF) (F)	32834.96	32980.66	33115.60	33311.06	33353.75
Total Working Capital (I) = (A+B+C+D+E+F)	**67198.81**	**67653.34**	**67917.27**	**68374.54**	**68686.62**
Rate of Interest (G)	12.05%	11.25%	10.50%	10.50%	10.50%
Total Interest on Working capital (H) = ((I)*(G)	**8097.46**	**7611.00**	**7131.31**	**7179.33**	**7212.09**

Annual Fixed Charges

94. Accordingly, the annual fixed charges approved for the generating station for the period 2019-24 is summarised below:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation (A)	11434.25	11878.80	12910.13	13706.12	13706.12
Interest on Loan (B)	2247.97	1996.16	1788.31	1456.94	1017.09
Return on Equity (C)	20570.08	20769.70	21065.19	21213.89	21213.86
Interest on Working Capital (D)	8097.46	7611.00	7131.31	7179.33	7212.09
O&M Expenses (E)	24573.33	25666.33	26121.57	27045.62	27993.38
Total annual fixed charges (F) = (A+B+C+D+E)	**66923.09**	**67921.99**	**69016.51**	**70601.89**	**71142.55**

Filing fees and Publication charges

95. The Petitioner has sought the reimbursement of the fees paid by it for filing of the tariff petition and for publication expenses and has submitted that the reimbursement of the same are in accordance with Regulation 70(1) of the 2019 Tariff Regulations. In

accordance with Regulation 70(1) of the 2019 Tariff Regulations, the Petitioner shall be entitled for reimbursement of the filing fees and publication expenses in connection with the filing of this petition, directly from the beneficiaries, on pro-rata basis, in accordance with Regulation 70(1) of the 2019 Tariff Regulations.

96. 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 recovery of statutory taxes, levies, duties, cess etc. levied by the statutory authorities in accordance with the 2019 Tariff Regulations.

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

98. Petition No. 417/GT/2020 is disposed of in terms of the above.

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