CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 418/GT/2020

Coram:
Shri P. K. Pujari, Chairperson
Shri I. S. Jha, Member
Shri Pravas Kumar Singh, Member

Date of Order: 24th January, 2022

In the matter of:

Petition for approval of tariff of Simhadri Super Thermal Power Station Stage-II (1000 MW) for the period from 1.4.2019 to 31.3.2024

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

5. Tamil Nadu Generation & Distribution Corporation Limited,
   144, Anna Salai,
   Chennai – 600 002

6. Bangalore Electricity Supply Company Limited,
Krishna Rajendra Circle,
Bangalore - 560 009

7. Mangalore Electricity Supply Company Limited,
MESCOM Bhavan, Corporate Office,
Bejai, Kavoor cross road,
Mangaluru-575004, Karnataka

8. Chamundeshwari Electricity Supply Corporation Limited
Corporate Office, No. 29, Vijayanagar, 2nd stage, Hinkal,
Mysore – 570 017.

9. Gulbarga Electricity Supply Company Limited,
Main road,
Gulbarga – 585 102, Karnataka

10. Hubli Electricity Supply Company Limited,
Corporate office, P.B. Road, Navanagar
Hubli – 580 025

11. Kerala State Electricity Board Limited,
Vaidyuthi Bhavanam, Pattom
Thiruvananthapuram – 695 004

12. Electricity department,
Government of Puducherry,
137, NSC Bose Salai
Puducherry- 605001 **…..Respondents**

Parties present:

Shri Venkatesh, Advocate, NTPC
Shri Ashutosh K. Srivastava, Advocate, NTPC
Shri Siddharth Joshi, Advocate, NTPC
Shri Anant Singh, Advocate, NTPC
Shri Abhishek Nangia, Advocate, NTPC
Shri Neil Chaterjee, Advocate, NTPC
Shri Vinay Kumar Garg, NTPC
Shri Ishpaul Uppal, NTPC
Shri Anand Pandey, NTPC
Shri B. Vinodh Kanna, Advocate, TANGEDCO
Ms. R. Ramalakshmi, TANGEDCO
Ms. R. Alamelu, TANGEDCO

ORDER

This petition has been filed by the Petitioner, NTPC Limited (in short, 'NTPC'), for approval of tariff of Simhadri STPS, Stage-II (1000 MW) (hereinafter referred to as 'the generating station') for the period from 1.4.2019 to 31.3.2024, in accordance with the provisions of the Central Electricity Regulatory Commission (Terms & 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 achieved COD on 16.9.2011 and Unit-II on 30.9.2012. The Commission vide its order dated 2.11.2015 in Petition No. 303/GT/2014 had approved the tariff of the generating station for the period from 16.9.2011 to 31.3.2014. Thereafter, vide order dated 9.5.2016 in Review Petition No. 2/RP/2016 (in Petition No. 303/GT/2014), the tariff of the generating station for the period from 16.9.2011 to 31.3.2014 was revised, based on the actual additional capital expenditure incurred for the said period. Subsequently, vide order dated 29.7.2016 in Petition No.294/GT/2014, the tariff of the generating station was determined for the 2014-19 tariff period. Thereafter, by order dated 1.5.2017 in Review Petition No. 50/RP/2016, the order dated 29.7.2016 in Petition No. 294/GT/ 2014 was modified, by considering the projected additional capital expenditure towards the construction of Railway siding for the years 2014-15 and 2015-16 respectively. Subsequently, in Petition No. 293/GT/2020 filed by the Petitioner for truing up of tariff of the generating station for the 2014-19 tariff period, the Commission vide its order dated 11.1.2022 had approved the capital cost and annual fixed charges, as under:

Capital Cost allowed

(Rs. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Capital Cost (A)	503884.86	535132.90	540200.38	541791.40	542890.95
Add: Admitted Additional capital expenditure (B)	31248.04	5067.48	1591.02	1099.55	2623.69
Closing Capital cost (C) = (A+B)	535132.90	540200.38	541791.40	542890.95	545514.64
Average Capital cost (D) = (A+C)/2	519508.88	537666.64	540995.89	542341.17	544202.79

Annual Fixed Charges allowed

(Rs. in lakh)

	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	26559.47	27374.71	27475.38	27539.68	27633.31
Interest on Loan	26521.69	25429.70	22683.19	19829.08	17345.22
Return on Equity	30562.71	31784.16	31980.97	32060.50	32257.08
Interest on Working Capital	11463.82	11564.50	11554.63	11762.82	11779.05
O&M Expenses	15062.74	16140.05	17081.08	18099.51	19173.15
Total annual fixed charges	**110170.42**	**112293.13**	**110775.25**	**109291.59**	**108187.81**

Present Petition

3. The Petitioner has filed the present Petition for determination of tariff for the generating station for the 2019-24 tariff period, in terms of the provisions of the 2019 Tariff Regulations and has claimed the capital cost and annual fixed charges as under:

Capital cost claimed

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Opening capital cost	561015.43	562193.43	565506.43	565785.43	568285.43
Add: Addition during the year/period	1178.00	3313.00	279.00	2500.00	0.00
Closing Capital Cost	562193.43	565506.43	565785.43	568285.43	568285.43
Average Capital Cost	**561604.43**	**563849.93**	**565645.93**	**567035.43**	**568285.43**

Annual Fixed Charges claimed

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	28507.04	28621.02	28712.19	28782.72	28846.17
Interest on Loan	15740.79	13482.52	11203.32	9068.72	6876.81
Return on Equity	31644.16	31770.69	31871.89	31950.18	32020.61
Interest on Working Capital	8716.89	8735.65	8750.71	8769.09	8783.41
O&M Expenses	24735.36	25635.53	26571.05	27542.60	28539.86
Annual Fixed Charges	**109344.25**	**108245.42**	**107109.16**	**106113.31**	**105066.86**

4. The Respondent No. 5, TANGEDCO and the Respondent No. 11, Kerala State Electricity Board Limited (KSEBL) have filed their replies vide affidavits dated 31.1.2021 and 9.4.2021 respectively. The Petitioner has filed its rejoinder to the replies of TANGEDCO and KSEBL, vide affidavits dated 6.4.2021 and 3.6.2021 respectively. This petition, along with Petition No.293/GT/2020 filed by the Petitioner for truing-up of tariff of the generating station for the 2019-24 tariff period, was heard on 11.6.2021 and the Commission, after directing the Petitioner, vide Record of the Proceeding, to furnish revised Form-15 (in Petition No.418/GT/2020), reserved its order in these petitions. In response, the Petitioner vide affidavit dated 28.6.2021 has filed the additional information after serving copies to the Respondents. Based on the submissions of the parties and the documents available on record, we proceed for approval of tariff of the generating station for the 2019-24 tariff period, in this petition, on prudence check, as stated in the subsequent paragraphs.

<u>Capital Cost</u>

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 4 above. The Commission vide its order dated 11.1.2022 in Petition No. 293/GT/2020 allowed the closing capital cost of Rs.545514.64 lakh as on 31.3.2019. Accordingly, in terms of Regulation 19(3) of the 2019 Tariff Regulations, the capital cost of Rs.545514.64 lakh as on 31.3.2019 (after removal of un-discharged liabilities of Rs.6702.96 lakh) 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 2019-24 tariff period.

Additional Capital Expenditure

7. Regulation 25 and Regulation 26 of the 2019 Tariff Regulations provide 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 2019- 24 tariff period. Clauses (1) and (2) of Regulations 25 and Regulation 26 of the 2019 Tariff Regulations, provide 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 2019-24 tariff period are as follows:

(Rs. in lakh)

	Head of Work/ Equipment	Regulation	2019-20	2020-21	2021-22	2022-23	2023-24	Total
1	Ash related Work	25(1)(c) & 25(1)(g)	135.00	2570.00	157.00	2500.00	0.00	5362.00
2	Fire detection and protection system for CHP	26(1)(b) & 26(1)(d)	200.00	0.00	0.00	0.00	0.00	200.00
3	Zero Liquid Discharge (ZLD) Work for Main plant and Ash Dyke area	26(1)(b)	470.00	220.00	0.00	0.00	0.00	690.00
4	Online Coal Analyser	26(1)(b)	373.00	0.00	0.00	0.00	0.00	373.00
5	Electro chlorination /CLO_2 for replacement of Chlorine dosing system	26(1)(b) & 26(1)(d)	0.00	523.00	122.00	0.00	0.00	645.00
	Total Projected additional capital expenditure claimed		**1178.00**	**3313.00**	**279.00**	**2500.00**	**0.00**	**7270.00**

(a) *Ash related Work*

9. The Petitioner has claimed total projected additional capital expenditure of Rs.5362.00 lakh (i.e., Rs.135.00 lakh in 2019-20, Rs.2570.00 lakh in 2020-21, Rs.157.00 lakh in 2021-22 and Rs.2500.00 lakh in 2022-23) under Regulation 25(1)(c) read with Regulation 25(1)(g) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that these are planned works related to Ash handling/ Ash related works which are carried out continuously during the operational life of the generating station. The Petitioner has prayed that the Commission may allow the projected additional capital expenditure claimed for the said works, as the same had already been approved within the original scope of work and are planned in

a phased manner, based on the expected quantum of works during the 2019-24 tariff period.

10. The Respondent, KSEBL has prayed that the Commission may disallow the projected additional capital expenditure claimed, as the Petitioner has not furnished the approval from the Board of Directors of the Petitioner Company as regards the projected additional capital expenditure claimed. The Petitioner, has, however, clarified that the Board of Directors had approved an amount of Rs.25490.00 lakh for Ash handling system/ Ash disposal area development works, on the basis of price of 1st quarter of 2007 and that the actual details of the work capitalized will be submitted at the time of truing-up of tariff of the generating station.

11. The submissions have been considered. It is noticed that the Petitioner in Form 5B of Petition No. 303/GT/2014 (truing-up of tariff for the 2009-14 tariff period of the generating station) had submitted that the original estimated cost for Ash related work is Rs.25490.00 lakh, as per the original Investment Approval dated 23.3.2007 and had claimed additional capital expenditure of Rs.12032.68 lakh up to COD (30.9.2012) and actual additional capital expenditure of Rs.1233.70 lakh between COD and 31.3.2014. This was approved by order dated 2.11.2015 in Petition No. 303/GT/2014. Thus, the total additional capital expenditure allowed for Ash related work till 31.3.2014 was Rs.13266.38 lakh. It is observed that by order dated 11.1.2022 in Petition No. 293/GT/2020 for the 2014-19 tariff period, the actual additional capital expenditure of Rs.11264.25 lakh (on cash basis) was allowed towards Ash Handling Plant (including DAES System) and Ash Dyke raising works. Thus, the total additional capital expenditure allowed for Ash Handling Plant (including DAES System) and Ash Dyke

till 31.3.2019 is Rs.24530.63 lakh and the balance additional capital expenditure for Ash related work is Rs.959.37 lakh, as worked out below:

(Rs. in lakh)

	Amount
Original Estimate Cost (as per Form 5B of 303/GT/2014 i.e., 2009-14 tariff period truing up petition) (A)	25490.00
Expenditure incurred up to COD i.e., 30.9.2012 (as per Form 5B of 303/GT/2014) (B)	12032.68
Additional capital expenditure allowed (till 31.3.2014) in order dated 2.11.2015 in Petition No. 303/GT/2014 (Truing up of tariff for 2009-14 tariff period) (C)	1233.70
Total expenditure allowed (till 31.3.2014) vide order dated 2.11.2015 in Petition No. 303/GT/2014 (D)=(B+C)	13266.38
Actual additional capital expenditure allowed (during 2014-19, on cash basis) in order dated 11.1.2022 in Petition No. 293/GT/2020 (E)	11264.25
Total expenditure allowed (till 31.3.2019, on actual basis) vide order dated 11.1.2022 in Petition No. 293/GT/2020 (F)=(D+E)	24530.63
Remaining balance additional capital expenditure from approved Investment Approval cost (G)=(A-F)	959.37

12. It is observed from the CEA Report on "Fly Ash Generation at Coal/Lignite based Thermal Power Stations and it's utilization in the country" for 2017-18, 2018-19, 2019-20 and 2020-21 that the entire generating station (i.e. Stage-I and Stage-II combined i.e., 2000 MW) has been meeting the fly ash utilization target of 100% as follows:

Year	Fly ash generation (MT)	Fly ash Utilization (MT)	Utilization (%)
2017-18	3.0110	3.0590	101.59
2018-19	2.9770	2.9820	100.17
2019-20	2.6389	4.4302	167.88
2020-21	2.4488	3.0249	123.52

13. It is further observed that from the CEA/NPP Reports and SRPC Annual Reports, that the Plant Load Factor (PLF) for entire generating station (i.e. Stage-I and Stage II combined i.e., 2000 MW) is as follows:

Year	PLF (%)
2015-16	82.36
2016-17	80.90
2017-18	67.20
2018-19	71.00
2019-20	60.60
2020-21	49.54

14. In view of the above trend of rising ash utilisation and falling PLF, we find no justification to allow the total projected additional capital expenditure of Rs.5362.00 lakh claimed by the Petitioner for the said work in this petition. However, as the balance amount as per investment approval cost available is Rs.959.37 lakh (as per paragraph 11 above), we allow the same as projected additional capital expenditure during the period 2019-21.

15. However, the Petitioner may approach the Commission, with full details and justification, at time of truing up, if the ash utilization is lesser than ash generated necessitating need for ash dyke/ ash disposal expenses, in terms of Regulation 26(1)(e) of the 2019 Tariff Regulations that provides the following:

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

(b) *Fire detection and protection system for CHP*

16. The Petitioner has claimed projected additional capital expenditure of Rs.200.00 lakh in 2019-20 under Regulation 26(1)(b) read with Regulation 26(1)(d) of the 2019 Tariff Regulations towards 'Fire detection and Protection system for CHP'. In justification of the same, the Petitioner has submitted that the projected additional capital expenditure is planned in compliance to the CEA (Technical standards for construction of Electric plants and lines), Regulations, 2010 and CEA (safety requirement for Construction, Operation and Maintenance of Electric plants and Electric lines), Regulations, 2011. The Petitioner has further submitted that the system

would cover the Stacker Reclaimer Area of CHP and sprinklers will be installed for enhanced safety against any hazard in the area.

17. The Respondent, TANGEDCO has submitted that since Unit-I and Unit-II of the generating station were commissioned on 16.9.2011 and 30.9.2012 respectively, the said CEA Regulations were notified prior to COD of the units. The Respondent has further submitted that the Petitioner has not furnished proper justification for the need for Fire protection system, after 10 years of commissioning and has, therefore, prayed that the projected additional capital expenditure claimed may be disallowed, as the Petitioner was aware of the said notification/ standards even prior to the commissioning of the units/ generating station. The Respondent, KSEBL has submitted that the projected additional capital expenditure claimed does not relate to 'change in law' or 'compliance of any existing law' and '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. The Respondent has further submitted that the works relating to fire-fighting are usually covered under the main plant package and the Petitioner had already claimed the cost of main plant package, including fire-fighting in 2014-15, which was approved and, therefore, the claim of the Petitioner in 2019-20 may be disallowed. The Petitioner has clarified that the additional capital expenditure claimed is required in compliance to the said CEA Regulations. It has also submitted that the work was awarded to M/s Unitech Machines Limited, which has been registered under NCLT because of its poor financial condition, on account of which the progress of the work at site as well as supplies was delayed.

18. The submissions have been considered. The Petitioner has claimed projected additional capital expenditure of Rs.200.00 lakh in 2019-20 towards augmentation of fire-fighting system in CHP etc., based on CEA (Technical Standards for construction of Electrical Plants and Electric Lines) Regulation, 2010 and Central Electricity Authority (Safety requirement for Construction, Operation and Maintenance of Electric plants and Electric lines), Regulations, 2011. The projected additional capital expenditure has been claimed by the Petitioner in terms of provisions of Regulations 26(1)(b) and 26(1)(d) of the 2019 Tariff Regulations. As regards claim under Regulation 26(1)(b) of the 2019 Tariff Regulations, it is pertinent to mention that in order dated 27.1.2017 in Review Petition No. 36/RP/2016 in Petition No. 270/GT/2014 (approval of tariff of Simhadri Super Thermal Power Station Stage-I for the 2014-19 tariff period), the claim of the Petitioner for additional capital expenditure of Rs.280.00 lakh towards augmentation of firefighting was disallowed on the ground that the same do not constitute 'change in law'. The relevant portion of the order is extracted under:

> *"After considering the claim of the petitioner, the Commission in order dated 27.6.2016 disallowed the additional capital expenditure under Regulations 14(3)(ii) and 14(3)(iii) of the 2014 Tariff Regulations. The petitioner has submitted that Regulation 12(5) of the CEA Regulations 2010 requires thermal generating station to be equipped with comprehensive/ automatic fire detection alarm and fire protection system and since these requirements were not existing earlier, the petitioner has installed the same by augmentation of the fire fighting system. The petitioner has submitted that the Commission has also not considered the other part of the Regulation 14(3) (ii) which provides for compliance of existing law which is the CEA Regulations, 2010 in the present case. None of the respondents have filed any reply. The submission of the petitioner is not acceptable. It is observed that the Units-I & II of the generating station have achieved COD during the years 2002 and 2003 respectively and hence, the CEA Regulations, 2010 and the CEA Regulations, 2011 cannot be made applicable to the existing generating station of the petitioner. There is also no mention in the said regulation to claim this status existing as on date of the notification of the CEA. In this background it was observed that the petitioner had not established the fact that the augmentation of the fire fighting system in CHP was due to any change in law and was therefore, disallowed in order dated 27.6.2016. Similarly, clause 4(2)(3) of the CEA Regulations (Safety provisions relating to owner), 2011 though applicable to the existing electrical plants and electric lines, is limited to obtaining the accreditation of electric plants and electric lines (IS-18001 certification) within two years from the date of coming into force. Moreover, the petitioner had not furnished any justification or documentary evidence to substantiate that the fire-fighting system was necessary for which*

certification is to be obtained by the petitioner in respect of the generating station. Accordingly, in our view there is no error apparent on the face of the order and prayer of the petitioner for review of the order dated 27.6.2016 under Regulation 14 (3) (ii) of the 2014 Tariff Regulations fails."

19. Having disallowed the same item of work in the 2014-19 period, the claim of the Petitioner for additional capital expenditure of the said work cannot be considered under 'change in law' in terms of Regulation 26(1)(b) of the 2019 Tariff Regulations.

20. Though the Commission by order dated 27.1.2017 in Review Petition No. 36/RP/2016 had not allowed the additional capitalisation of Rs.280.00 lakh towards augmentation of firefighting (as stated in paragraph 18 above), by the same order, the additional capital expenditure of Rs.280.00 lakh was allowed on the ground that the expenditure was required for higher security and safety of the plant. The relevant portion of the order is extracted 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.

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.

(c) *ZLD WORK for Main plant*

22. The Petitioner has claimed projected additional capital expenditure of Rs.690.00 lakh (i.e., Rs.470.00 lakh in 2019-20 and Rs.220.00 lakh in 2020-21) towards Zero Liquid Discharge (ZLD) work for Main plant and Ash Dyke area under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification of the claim, the Petitioner has submitted that the generating station is using sea water in condenser, ash handling system, auxiliary cooling water and sweet water for other purposes. The Petitioner has also furnished copy of the consent order dated 31.7.2017 received from Andhra Pradesh Pollution Control Board ('APPCB') which has directed the Petitioner to minimize and reduce water consumption to the extent possible. The Petitioner has further submitted that as ZLD work would help to reduce consumption of water at the generating station through ash water recirculation, the same may be allowed under Regulations 26(1)(b) of the 2019 Tariff Regulations.

23. The Respondent, TANGEDCO while pointing out that the Petitioner has not furnished the details of the scope of work, has submitted that if facilities like Sewage Treatment Plant, Effluent Treatment Plant and Ash slurry recovery water system from ash dyke are already available in the plant, the need for such additional capitalisation may be borne by the Petitioner. The Respondent, KSEBL has submitted that the claim may be disallowed, as the Petitioner has neither furnished the details of water consumption through this system nor has carried out any study of any alternative for reducing water consumption in the plant within the existing investment approval. The Petitioner has clarified that the additional capital expenditure is required in compliance to the directions of APPCB contained in its communication dated 31.7.2017 and, therefore, the additional capital expenditure claimed under Regulations 26(1)(b) of the 2019 Tariff Regulations may be allowed.

24. The submissions have been considered. It is noticed that the APPCB consent order dated 31.7.2017 is a renewal of consent of the generating station. It is not clear from the submissions of the Petitioner as to what compliances are to be made by the Petitioner in terms of the said order and whether it had been complying with the earlier directives, if any. Moreover, the Petitioner has also not projected any requirement of installations, in addition to the presence of existing facilities like Sewage Treatment Plant (STP), Effluent Treatment Plant and Ash Slurry recovery water system from ash dyke. It is pertinent to mention that the Petitioner has also filed Petition No. 467/MP/2019 (NTPC v APEPDCL & ors.) before this Commission seeking approval of the additional expenditure for installation of various Emission Control Systems in the generating station in compliance to the MOEF&CC, GoI notification dated 7.12.2015. In the said petition, the Petitioner had prayed for grant of liberty to approach the

Commission for approval of implementation of Revised Emission Systems on account of mercury, particulate matter, including specific water consumption, if required. The Commission by order dated 30.9.2021 has disposed of the said petition granting liberty to the Petitioner on this ground. As the said works are quite complimentary to the additional capital expenditure claimed by the Petitioner on account of ZLD work, in the present petition, the Petitioner's claim for additional capital expenditure of Rs.690.00 lakh for augmentation of ZLD WORK for Main plant and Ash Dyke area in 2019-21 is not allowed. The Petitioner may claim the additional capital expenditure in a comprehensive manner in terms of liberty granted vide order dated 30.9.2021 in Petition No. 467/MP/2019.

(d) *Online Coal Analyser*

25. 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. The Petitioner has furnished copy of the OM (office memorandum) dated 26.8.2015 from MOEF&CC, which mandated all coal based thermal power plants with installed capacity of 100 MW and above located at a distance of 500 km 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% as content in coal. The Petitioner has further submitted that the said OM directs real time monitoring, using auto mechanical sampling (online) from moving stream of coal used for sampling fuels. The Petitioner has also submitted that as the generating station is located at about 600-700 km from the linked mines and also source coal from other mines, under flexible coal utilization scheme, it is obligated to incur the expenditure for installation of 'Online coal analyser' to comply

with the MOEF&CC directions and has prayed that claim may be allowed under change in law.

26. The Respondent, TANGEDCO has submitted that the Online coal analyser system is required for generating stations using coal with ash content less than 34% and the Petitioner in Form-15 has mentioned that no blended coal is used. Accordingly, it has submitted that the Petitioner may be directed to furnish documentary evidence of the percentage of ash content in the coal used for the generating station. The Respondent, KSEBL has submitted that the additional capital expenditure claimed by the Petitioner may be met from the O&M expenses allowed to the generating station. The Petitioner has clarified that that the additional capital expenditure claimed is required in compliance to the MoEF&CC notification dated 26.8.2015. It has also referred to APTEL judgment dated 30.9.2019 in Appeal No. 246/2014 and judgment dated 10.2.2015 in Appeal No. 171/2012 and submitted that the claim may be allowed. The Petitioner, therefore, has prayed that the said work is uncontrollable in nature and may be allowed under Change in law in terms of Regulation 26(1)(b) of the 2019 Tariff Regulations.

27. The submissions have been considered. It is observed that the MoEF&CC notification dated 26.8.2015 mandates 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.

(e) ***Electro chlorination /CLO_2 for replacement of Chlorine dosing system***

28. The Petitioner has claimed projected additional capital expenditure of Rs.645.00 lakh (Rs.523.00 lakh in 2020-21 and Rs.122.00 lakh in 2021-22) for Electro chlorination/ CLO_2 for replacement of Chlorine dosing system during 2020-22 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 at present, Chlorine gas is being dozed directly at various stages of water treatment to maintain water quality and to inhibit organic growth in the water retaining structures/ equipment such as clarifiers, storage tanks, cooling towers, condenser tubes & piping etc. It has submitted that Chlorine dosing is carried out from chlorine stored in cylinders/ tonners and as chlorine gas is very hazardous, it may prove fatal in case of leakage. Also, handling and storage of chlorine gas involves risk to the life of public at large. Therefore, considering public safety, the chlorine dozing system is being replaced by Chlorine Dioxide (ClO_2) system, which is much safer and less hazardous than chlorine. The Petitioner has further submitted that Department of Factories, Boiler, Industrial Safety and Health, Govt of Karnataka at Kudgi NTPC project, has asked the Petitioner to replace highly hazardous gas chlorination system with ClO2 system. The Petitioner has also submitted copy of OM dated 28.2.2014 from SPCB, Odisha which asked NTPC to explore the possibility of installing ClO_2 system instead of Chlorine gas system while issuing consent to establish in case of Darlipalli Station. Therefore, the Petitioner has prayed to allow the same under Regulation 26(1)(b) read with Regulation 26(1)(d) of the 2019 Tariff Regulations.

29. The Respondent, TANGEDCO has submitted that the Petitioner has not clarified as to whether there has been any violation of safety and security in the past with the existing chlorination system or not. The Respondent has further submitted

that if the chlorine detection and absorption system is properly maintained, there is no possibility of any hazard. It has added that unlike the State Government of Karnataka, no such notification has been issued by the State Government of Andhra Pradesh to replace the highly hazardous gas chlorination system with ClO_2 system and, hence, the claim may be disallowed. The Respondent, KSEBL has submitted that the capital work proposed by the Petitioner does not relate to change in law or compliance of any existing law and need for higher security and safety of the plant and, therefore, the claim may be disallowed. The Petitioner has clarified that ClO_2 will be produced on site by using commercial grade HCI and sodium chlorite, thereby avoiding the handling and storage risk and, hence, the additional capital expenditure claimed may be allowed as the same has been planned to keep the safety of the public in priority.

30. 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 (Simhadri TPS) warranting the additional capitalization of the expenditure. As regards the claim of the Petitioner under Regulation 26(1)(d) of the 2019 Tariff Regulations, we find no specific direction or advice from any Governmental or statutory authorities as regards the 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.

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

(Rs. in lakh)

		2019-20	2020-21	2021-22	2022-23	2023-24	Total
Ash related Work (A)	Claimed	135.00	2570.00	157.00	2500.00	0.00	5362.00
	Allowed	135.00	824.37	0.00	0.00	0.00	959.37
Fire detection and protection system for CHP (B)	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
ZLD Work for Main plant and Ash Dyke area (C)	Claimed	470.00	220.00	0.00	0.00	0.00	690.00
	Allowed	0.00	0.00	0.00	0.00	0.00	0.00
Online Coal Analyser (D)	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
Electro Chlorination /CLO2 for replacement of Chlorine dosing System (E)	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
Total Additional Capitalisation Expenditure (F) = (A+B+C+D+E)	**Claimed**	**1178.00**	**3313.00**	**279.00**	**2500.00**	**0.00**	**7270.00**
	Allowed	**708.00**	**824.37**	**0.00**	**0.00**	**0.00**	**1532.37**

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	508.00	824.37	0.00	0.00	0.00	1332.37
Less: De-capitalization	0.00	0.00	0.00	0.00	0.00	0.00
Add: Discharges of liabilities (against allowed assets/ works)	0.00	0.00	0.00	0.00	0.00	0.00
Net projected additional capital expenditure allowed (on cash basis)	508.00	824.37	0.00	0.00	0.00	1332.37

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	200.00	0.00	0.00	0.00	0.00	200.00
Less: De-capitalization	0.00	0.00	0.00	0.00	0.00	0.00

Add: Discharges of liabilities (against allowed assets/ works)	0.00	0.00	0.00	0.00	0.00	0.00
Net projected additional capital expenditure allowed (on cash basis)	200.00	0.00	0.00	0.00	0.00	200.00

Capital cost allowed

32. As stated earlier, the closing capital cost of Rs.545514.64 lakh as on 31.3.2019, as approved by order dated 11.1.2022 in Petition No. 293/GT/2020 has been considered as the opening capital cost as on 1.4.2019. As such, the capital cost allowed for the purpose of tariff for the 2019-24 tariff period is as follows:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Opening Capital Cost (A)	545514.64	546222.64	547047.00	547047.00	547047.00
Add: Admitted Additional capital expenditure (B)	708.00	824.37	0.00	0.00	0.00
Closing Capital Cost (C) = (A+B)	**546222.64**	**547047.00**	**547047.00**	**547047.00**	**547047.00**
Average Capital cost (D) = [(A+C)/2]	545868.64	546634.82	547047.00	547047.00	547047.00

Debt-Equity Ratio

33. 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."

34. The Commission vide its order dated 11.1.2022 in Petition No. 293/GT/2020 has considered gross loan and equity of Rs.381860.25 lakh and Rs.163654.39 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.381860.25 lakh and Rs.163654.39 lakh has been considered as gross loan and equity as on 1.4.2019. Based on the above Regulation, debt-equity ratio of 70:30 has been applied on year wise allowed additional capital expenditure for arriving at the additions to loan and equity during each year of the 2019-24 tariff period. The debt-equity ratio considered for the purpose of tariff is as follows:

(Rs. in lakh)

	Capital Cost as on 1.4.2019	(%)	Additional Capitalization in 2019-24	(%)	Capital Cost as on 31.3.2024	(%)
Debt	381860.25	70.00%	1072.66	70.00%	382932.90*	70.00%

Equity	163654.39	30.00%	459.71	30.00%	164114.10	30.00%
Total	**545514.64**	**100.00%**	**1532.37**	**100.00%**	**547047.00***	**100.00%**

**Variance due to rounding off*

Return on Equity

35. 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."

36. Further, 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.

37. The additional capital expenditure within the original scope of work is calculated as per methodology provided in Regulation 30 and Regulation 31 of the 2019 Tariff Regulations. The ROE beyond the original scope of work has been calculated by considering the weighted average rate of interest, as considered for computation of interest on loan. For equity base, ROE has been calculated by grossing up of ROE during the 2019-24 tariff period. 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 2019-24 tariff period. The 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. However, for the additional capital expenditure allowed beyond the original scope of work, excluding the additional capital expenditure due to change in law, the eligible ROE has been allowed at weighted average rate of interest of 8.263% for 2019-20, 8.246% for 2020-21, 8.233% for 2021-22, 8.373% for 2022-23 and 8.556% for 2023-24. This is subject to truing-up. Accordingly, ROE has been allowed based on projected additional capital expenditure allowed as under:

(a) Return on Equity at Normal Rate

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Normative Equity-Opening (A)	163654.39	163806.79	164054.10	164054.10	164054.10
Addition of Equity due to additional capital expenditure (B)	152.40	247.31	0.00	0.00	0.00
Normative Equity-Closing (C) = (A) + (B)	163806.79	164054.10	164054.10	164054.10	164054.10
Average Normative Equity (D) = [(A+C)/2]	163730.59	163930.45	164054.10	164054.10	164054.10
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)]	**30751.07**	**30788.60**	**30811.83**	**30811.83**	**30811.83**

(b) Return on Equity at WAROI Rate

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Normative Equity - Opening (A)	0.00	60.00	60.00	60.00	60.00
Addition of Equity due to additional capital expenditure (B)	60.00	0.00	0.00	0.00	0.00
Normative Equity-Closing (C) = (A) + (B)	60.00	60.00	60.00	60.00	60.00
Average Normative Equity (D) = (A+C)/2	30.00	60.00	60.00	60.00	60.00
Weighted average rate of interest on actual loan portfolio (E)	8.263%	8.246%	8.233%	8.373%	8.556%
Return on Equity (Pre Tax) - annualised (E) = (D) x (E)	**2.48**	**4.95**	**4.94**	**5.02**	**5.13**

Interest on Loan

38. 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."

39. Interest on loan has been computed as under:

a) The gross normative loan amounting to Rs.381860.25 lakh as on 31.3.2019 as considered in order dated 11.1.2022 in Petition No. 293/GT/2020 has been considered as on 1.4.2019;

b) Cumulative repayment amounting to Rs.186665.39 lakh as on 31.3.2019 as considered in order dated 11.1.2022 in Petition No. 293/GT/2020 has been considered as on 1.4.2019;

c) Accordingly, the net normative opening loan as on 1.4.2019 works out to be Rs.195194.86 lakh;

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

e) Depreciation allowed has been considered as repayment of normative loan during the respective years of the 2019-24 tariff period.

40. The Petitioner has claimed interest on loan by applying the weighted average rate of interest of 8.2634%, 8.2464%, 8.2325%, 8.3728% and 8.5562% for 2019-20, 2020-21, 2021-22, 2022-23 and 2023-24 respectively. The same has been considered for the purpose of tariff. The Petitioner, is however, directed to submit documentary evidence for the rate of interest considered in Form-13 and repayment schedule of loan, at the time of truing up of tariff. 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)	381860.25	382355.85	382932.91	382932.91	382932.91
Cumulative repayment of loan up to previous year (B)	186665.39	214373.68	242120.86	269888.97	297657.07
Net Loan Opening (C) = [(A) - (B)]	195194.86	167982.17	140812.04	113043.94	85275.83
Addition due to additional capital expenditure (D)	495.60	577.06	0.00	0.00	0.00
Repayment of Loan during the period (E)	27708.29	27747.18	27768.11	27768.11	27768.11
Net Loan Closing (F) = [(C) +(D) -(E)]	167982.17	140812.04	113043.94	85275.83	57507.72
Average Loan (G) = [(C+F)/2]	181588.51	154397.11	126927.99	99159.88	71391.78
Weighted Average Rate of Interest of loan (H)	8.2634%	8.2464%	8.2325%	8.3728%	8.5562%
Interest on Loan (I) = [(G)*(H)]	**15005.32**	**12732.21**	**10449.37**	**8302.47**	**6108.40**

Depreciation

41. 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."

42. Accordingly, cumulative depreciation amounting to Rs.187078.97 lakh as on 31.3.2019 as considered in order dated 11.1.2022 in Petition No. 293/GT/2020 has been considered for the purpose of tariff. The balance depreciable value (before providing depreciation) for 2019-20 works out to Rs.304202.81 lakh. Since, as on 1.4.2019, the elapsed life of the generating station is 7.02 years, which is less than 12 years from the effective station COD of 24.3.2012, depreciation has been calculated by applying weighted average rate of depreciation (WAROD) for the 2019-24 tariff period. The calculations for WAROD are enclosed as Annexure-I to this order. Accordingly, depreciation has been worked out and allowed as follows:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Opening Capital Cost (A)	545514.64	546222.64	547047.00	547047.00	547047.00
Add: Net Additional Capital Expenditure (Projected) (B)	708.00	824.37	0.00	0.00	0.00
Closing Capital Cost (C)	546222.64	547047.00	547047.00	547047.00	547047.00
Average Capital Cost (D) = [(A+C)/2]	545868.64	546634.82	547047.00	547047.00	547047.00
Value of freehold land included above (E)	0.00	0.00	0.00	0.00	0.00
Value of IT equipment & software included above (F)*	0.00	0.00	0.00	0.00	0.00
Aggregated depreciable value (G) = [(D-E-F)X90% + (F)]	491281.77	491971.34	492342.30	492342.30	492342.30
Remaining aggregated depreciable value at the beginning of the year (H) = [(G) – Cumulative Dep. (shown at 'O') at the end of	304202.81	277184.08	249807.86	222039.76	194271.65

	2019-20	2020-21	2021-22	2022-23	2023-24
previous year]					
No. of completed years at the beginning of the year (I)	7.02	8.02	9.02	10.02	11.02
Balance useful life at the beginning of the year (J)	17.98	16.98	15.98	14.98	13.98
Weighted Average Rate of Depreciation (WAROD) (K) (as per Annexure–I)	5.076%	5.076%	5.076%	5.076%	5.076%
Combined depreciation during the year (L)	27708.29	27747.18	27768.11	27768.11	27768.11
Cumulative depreciation at the end of the year (before adjustment for de-capitalization) (M) = [(L) + Cumulative Depreciation (shown at 'O') at the end of previous year]	214787.26	242534.44	270302.55	298070.65	325838.76
Less: Depreciation adjustment on account of de-capitalization (N)	0.00	0.00	0.00	0.00	0.00
Cumulative depreciation at the end of the year (O)**	**214787.26**	**242534.44**	**270302.55**	**298070.65**	**325838.76**

** As per the Petitioner submissions, the details of IT Equipment will be provided at the time of truing up.*
***The cumulative depreciation at the end of 2018-19 is Rs. 187078.97 lakh*.

O&M Expenses

43. 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:

(in Rs. lakh/MW)

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

44. 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	23300	24120	24970	25840

45. As stated earlier, the generating station, with a capacity of 1000 MW comprises of two units of 500 MW each and the date of commercial operation of Unit-I is 16.9.2011 and Unit-II is 30.9.2012. Similarly, Stage-I of the generating station comprises of two units of 500 MW each with COD as 1.9.2002 for Unit-I and 1.3.2003 for Unit-II. Thus, the total capacity is 2000 MW (both Stage-I and Stage-II) which comprise of four units of 500 MW each. Thus, in terms of Regulation 35(1)(1) of the 2019 Tariff Regulations, the O&M expenses as claimed by the Petitioner above, has been allowed for the 2019-24 tariff period:

Water Charges

46. 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;

47. The actual water charges claimed by the Petitioner and allowed by order dated 11.1.2022 in Petition No. 293/GT/2020 for the 2014-19 tariff period is as follows:

(in Rs. lakh/MW)

	2014-15	2015-16	2016-17	2017-18	2018-19
Claimed	662.74	815.77	681.43	794.29	746.70
Allowed	662.74	815.77	681.43	794.29	746.70

48. The Petitioner has claimed water charges as follows:

(in Rs. lakh/MW)

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

49. 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 as applicable for 2019-24 tariff period are as under:

Description	Remarks
Type of Plant	Coal Based
Type of cooling water system	NDCT
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 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

50. It is noticed that the Petitioner has not furnished the detailed computation of the water charges claimed during the 2019-24 tariff period. However, the Petitioner has submitted the Bulk Water Supply Agreement executed between the Petitioner and the State of Andhra Pradesh, Vishakhapatnam Industrial Water Supply Company Ltd. Clause (1)(B) of the terms and conditions of the said agreement provides for special water charges rates to be applicable to the generating station for the 2019-24 tariff period. Therefore, the actual water consumption for 2018-19 and agreed special water

charges, as per the Bulk Water Supply Agreement, for the respective years of the 2019-24 tariff period has been considered for water charges applicable for the 2019-24 tariff period. The total water charges for the generating station arrived as discussed above has been divided amongst the stages of the generating station in the same ratio of their installed capacity. However, the Petitioner at the time of truing up, shall furnish the detail of actual water consumption (in cubic meters), rate (Rs/ Cubic meter) and power charges separately. The water charges allowed are subject to the truing up as per actual water charges paid after prudence check. The water charges approved for 2019-24 tariff period is as follows:

(Rs in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Sea Water (A)	9242551.00	9242551.00	9242551.00	9242551.00	9242551.00
Rate (B)	16.60	17.43	18.31	19.22	20.18
Water charges for Sea Water (C) = (A) x (B)	1534.67	1611.41	1691.98	1776.57	1865.40
Sweet Water (D)	90931407.00	90931407.00	90931407.00	90931407.00	90931407.00
Rate (E)	0.05	0.05	0.05	0.05	0.05
Water charges for Sweet Water (F) = (D) x (E)	45.47	45.47	45.47	45.47	45.47
Total Water Charges for Simhadri (G) = (C + F)	1580.14	1656.87	1737.44	1822.04	1910.87
Water Charges for Simhadri STPS Stage - II (50%) (H) = (G/2)	790.07	828.44	868.72	911.02	955.43
Water Charges for Simhadri STPS Stage - II (50%) (I) = (G/2)	790.07	828.44	868.72	911.02	955.43

Security Charges

51. The second 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:*
>
> *Xxxx*
>
> *Provided further that the generating station shall submit the assessment of the security requirement and estimated expenses;*
>
> *Xxx"*

52. The Petitioner has claimed total security expenses of Rs.7422.90 lakh for the 2019-24 tariff period, in terms of the second proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations. It has, however, not furnished any justification and the assessment of security, for the expenses claimed. It is observed that the Petitioner vide affidavit dated 28.6.2021, has submitted that the actual security expenses for the generating station for 2018-19 was Rs.1234.87 lakh. Considering the fact that security expenses for thermal generating stations for the 2019-24 tariff period, is required to be allowed separately, after prudence check, based on the assessment of the security requirement and estimated expenses to be furnished by the Petitioner, we provisionally allow the security expenses for the 2019-24 tariff period with 5% escalation per year, on the actual expenses incurred for 2018-19 (i.e.1234.87 lakh). The Petitioner shall, at the time of truing up, furnish the actual security expenses incurred along with proper justification and assessment in terms of Regulation 35(1)(6) of the 2019 Tariff Regulations. Accordingly, the security expenses as claimed by the Petitioner and allowed are summarised below:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Claimed	1343.36	1410.53	1481.05	1555.10	1632.86
Allowed	1296.61	1361.44	1429.52	1500.99	1576.04

Capital spares

53. The Petitioner has not claimed any capital spares, on projection basis, during the 2019-24 tariff period 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.

54. Accordingly, the total O&M expenses, including Water charges and Security expenses, claimed and allowed for the 2019-24 tariff period 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 Regulation 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 (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 (D)	Claimed	882.00	925.00	970.00	1017.50	1067.00
	Allowed	790.07	828.44	868.72	911.02	955.43
Security Expenses (E)	Claimed	1343.36	1410.53	1481.05	1555.10	1632.86
	Allowed	1296.61	1361.44	1429.52	1500.99	1576.04
Total O&M expenses as allowed (including Water Charges and Capital Spares (F) = (C+D+E)	Claimed	24735.36	25635.53	26571.05	27542.60	28539.86
	Allowed	**24596.68**	**25489.88**	**26418.24**	**27382.01**	**28371.48**

Fly Ash Transportation charges

55. The Petitioner has submitted that fly ash transportation charges will be claimed at the time of truing up of tariff, based on the actual expenses incurred. It is, however, noticed that the Petitioner has filed Petition No. 205/MP/2021 with regard to reimbursement of fly ash transportation charges in respect of its generating stations and has raised issues with regard to the higher liability of the Respondents therein on

account of interest burden and cash flow issues faced by the Petitioner. Some of the Respondents therein (including TANGEDCO) have raised issues on ‘maintainability’ of Petition No. 205/MP/2021. Therefore, the reimbursement of fly ash transportation charges will be governed by decision of the Commission in Petition No. 205/MP/2021.

Additional Expenditure on Emission Control System

56. The Petitioner, in terms of the Ministry of Environment and Forests and Climate Change (MOEF&CC) notification dated 7.12.2015 has submitted that it is in the process of installing the Emission Control Systems (ECS) for this generating station. 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 at this generating station, in compliance of 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. The claim of the Petitioner for additional expenditure on emission control system shall, therefore, be guided by order dated 30.9.2021 in Petition No. 467/MP/2019.

Operational Norms

57. The operational norms considered by the Petitioner in Form-3 of the petition is as follows:

Normative Annual Plant Availability Factor (NAPAF) %	85
Gross Station Heat Rate (kcal/kwh)	2391.71
Auxiliary Power Consumption %	5.99
Specific Oil Consumption (ml/kwh)	0.50

(a) Normative Annual Plant Availability Factor

58. 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%.

59. The Petitioner has considered NAPAF of 85% during the 2019-24 tariff period as per Regulation 49(A)(a) of 2019 Tariff Regulations and, hence, the same is allowed.

(b) Station Heat Rate

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

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

1.05 X Design Heat Rate (kCal/kWh)

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

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

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

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

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

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

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

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

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

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

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

61. The Petitioner has furnished the Gross Station Heat Rate as 2391.71 kCal/kWh, based on the Guaranteed Design Gross Turbine Cycle Heat Rate of 1932.50 (kCal/kWh)[3] and Design/ Guaranteed Boiler Efficiency of 84.84 (%), as provided in the Form 2 of the petition as follows:

Main Steams Pressure at Turbine inlet	(kg/cm^2)	170
Main Steam Temperature at Turbine inlet	(^{o}C)	537
Reheat Steam Temperature at Turbine inlet	(^{o}C)	565
Type of BFP	(No.)	Steam Driven (2 No.) and Motor driven (1 No.)
Guaranteed Design Gross Turbine Cycle Heat Rate	(kCal/kWh)[3]	1932.5
Design/ Guaranteed Boiler Efficiency	(%)	84.84

62. It is observed that the Petitioner, while computing the Station Heat Rate, has failed to notice that the Design Heat Rate of a generating unit is required to be computed, based on the heat rate guaranteed by the supplier at conditions of 100% MCR, zero percent make up, design coal and design cooling water temperature/ back pressure. Therefore, the Station Heat Rate is required to be recomputed as per details provided in the Form-2 of the petition.

63. The Petitioner, in Form-2 of the petition, has furnished the design turbine cycle heat rate and boiler efficiency of the generating station as 1932.5 kCal/kWh and 84.84% respectively. In terms of the 2019 Tariff Regulations, where the boiler efficiency is below 86% (as has been claimed for this generating station i.e. 84.84%) for sub-bituminous Indian coal, the same shall be considered as 86%. Therefore, the Turbine Cycle Heat rate and boiler efficiency has been considered as 1932.5 and 86% respectively, for computation of design heat rate. Accordingly, the design heat rate of the generating station works out as 2247.093 kCal/kWh (i.e. 1932.5/0.86). Considering the design parameters of the generating station, for the pressure rating of 170 kg/cm^2, super heater temperature of 537^{0}C and re-heater temperature of 565^{0}C, the ceiling design unit heat rate is 2250 kCal/kWh, considering the Max Turbine Heat rate of 1935 kCal/kWh and boiler efficiency of 86%, as per the 2019 Tariff Regulations. Thus, the design heat rate of the generating station works out as 2247.093 kCal/kWh (i.e. 1932.5/0.86), which is lower than the ceiling design heat rate of 2250 kCal/kWh.

64. Regulation 49(C)(b)(i) of the 2019 Tariff Regulations provides that for new thermal generating stations achieving COD on or after 1.4.2009, the Gross Station Heat Rate is = 1.05 x Design Heat Rate = (1.05 x 2247.093 =2359.448 kCal/kWh). Hence, GSHR of 2359.448 kCal/kWh has been considered for the purpose of tariff.

(c) Auxiliary Power Consumption:

65. 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:

66. The Petitioner has claimed Auxiliary Power Consumption (APC) of 5.99% and has submitted that as the generating station is located in the coastal region, sea water, instead of river water, is used for condenser cooling, auxiliary equipment cooling and ash handling system. As the specific gravity of sea water (1.025) is higher than that of river water (1.00), the Cycle of Concentration (COC) is to be maintained below 1.5 instead of 3.0, as required in sweet water and, therefore, more blow down is required with sea water, resulting in more pumping power than that required for sweet water. The Petitioner has referred to the paragraph 14.4 of the Statement of Objects and Reasons (SOR) for the 2019 Tariff Regulations, which is as follows:

"14.4.1………The additional auxiliary consumption of coastal plants for usage of sea water have not been made part of tariff Regulation as the same would vary from station to station depending upon the equipment installed, configuration which will be considered separately on case to case basis"

67. Accordingly, the Petitioner has submitted that the APC of 5.99% may be allowed in exercise of the power under Regulation 76 (power to relax) and Regulation 77 (removal of difficulty) of the 2019 Tariff Regulations.

68. The matter 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 2014-19 tariff period, had rejected the Petitioner's claim for additional APC. The relevant portion of the order dated 11.1.2022 is extracted as follows:

"*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 utilisation 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."*

69. In view of the above, the claim of the Petitioner for approval of additional auxiliary energy consumption has not been allowed. The generating station comprising of two units of 500 MW each and having Natural Draft Cooling Tower, qualifies for normative auxiliary power consumption of 5.75% for the 2019-24 tariff period and the same has been considered for computation of energy charges for the 2019-24 tariff period.

(d) Specific Oil Consumption

70. 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 said regulations, the same is allowed for determination of tariff for the 2019-24 period.

71. Based on the above, the operational norms considered for determination of energy charges for the generating station for the 2019-24 tariff period are as under:

Normative Annual Plant Availability Factor (NAPAF) (%)	85
Heat Rate (kCal/kWh)	2359.448
Auxiliary Power Consumption (%)	5.75
Specific Oil Consumption (ml/kWh)	0.50

Interest on Working Capital

72. Sub-section (c) of clause (1) of Regulation 34 the 2019 Tariff Regulation 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

73. The Petitioner has claimed ECR of 284.534 paise/kWh and fuel component in working capital as follows:

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Cost of coal for 45 days	27068.89	27068.89	27068.89	27068.89	27068.89
Cost of Secondary fuel oil for 2 months	262.50	261.79	261.79	261.79	262.50

74. The Petitioner has claimed the 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.

75. It is observed that the Petitioner in Form-15 of the petition had not furnished the opening stock of coal and coal received during the months of October 2018, November 2018 and December 2018, separately. The Petitioner has, instead, considered the quantity of coal and the amount charged by coal companies, inclusive of opening stock of coal. In compliance to the direction of the Commission vide ROP of the hearing dated 11.6.2021, the Petitioner vide affidavit dated 28.6.2021, has furnished the revised Form 15, separately indicating the opening stock of coal and coal received during the months of October 2018, November 2018 and December 2018.

76. On perusal of the data furnished by the Petitioner, it is observed that the Petitioner, while computing the landed cost of fuel, 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, 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 component in working capital for the months of October 2018, November 2018 and December 2018 as follows:

	October, 2018	**November, 2018**	**December, 2018**
Claimed (Rs/MT)	3471.04	3724.88	4012.74
Allowed (Rs/MT)	3451.52	3725.25	4084.12

77. 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 are allowed as under:

(Rs. in Lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Cost of Coal for Stock (20 Days)	10723.19	10723.19	10723.19	10723.19	10723.19
Cost of Coal for Generation (30 Days)	16084.79	16084.79	16084.79	16084.79	16084.79
Cost of Secondary fuel oil for 2 months	262.50	261.79	261.79	261.79	262.50

Energy Charge Rate (ECR)

78. The Petitioner has claimed ECR (ex-bus) of 2.845 Rs/kWh, based on the weighted average price, GCV of coal & oil procured and burnt for the months of October 2018, November 2018 and December 2018. ECR as worked out based on the operational norms specified under the 2019 Regulations and on “as received” GCV of coal for the three months i.e., October 2018 to December 2018 have been considered for allowing two months of energy charge in working capital as follows:

Description	Unit	2019-24
Capacity	MW	1000.00
Gross Station Heat Rate	kCal/kWh	2359.448
Auxiliary Energy Consumption	%	5.75
Weighted average GCV of oil	kCal/lit	9850.44
Weighted average GCV of coal	kCal/kg	3377.20 (3462.20-85)
Weighted average price of oil	Rs/KL	42189.48
Weighted average price of Coal	Rs/MT	3769.80
Rate of energy charge ex-bus	Rs/kWh	2.8110

Working capital for O&M Expenses (1 month)

79. O&M expenses for 1 month claimed by the Petitioner for the purpose of working capital (including water charges and security expenses) are as follows:

(Rs. in lakh)

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

80. 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 follows:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
2049.72	2124.16	2201.52	2281.83	2364.29

Working capital for Maintenance Spares

81. 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
4919.34	5097.98	5283.65	5476.40	5674.30

82. The difference between the claimed O&M expenses for 1 month and Maintenance spares by the Petitioner and those allowed as above, is on account of

the variation in the water charges and security expenses claimed by the Petitioner and allowed in this order.

Working capital for Receivables

83. 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
Fixed charges for 45 days	12753.90	12583.18	12378.82	12234.64	12054.42
Energy charges for 45 days	243.21	242.55	242.55	242.55	243.21
	12997.12	**12825.73**	**12621.37**	**12477.18**	**12297.64**

84. 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.

85. 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

86. In accordance with Regulation 34(3) of the 2019 Tariff Regulations, the Petitioner has claimed rate of interest on working capital as 12.05% (i.e., 1 year SBI

MCLR of 8.55% as on 1.4.2019 + 350 basis points) on projection basis, for the 2019-24 tariff period. However, as the tariff of the generating station for 2019-24 tariff period is being determined during the year 2021-22, the SBI MCLR as on 1.4.2020 (7.75%) and as on 1.4.2021 (7.00%) is also available, which is lower in comparison to the same, as on 1.4.2019 (8.55%). Since the rate of interest on working capital is subject to revision at the time of truing-up of tariff, based on the bank rate as on 1st April of each financial year, we find it prudent to allow the rate of interest as on 1.4.2020 and 1.4.2021, for the subsequent financial years. Accordingly, the rate of interest for the year 2019-20 is 12.05%, 2020-21 is 11.25% and for the subsequent years, the rate of interest of 10.50% has been considered (i.e., 1 year SBI MCLR of 7.75% as on 1.4.2020 + 350 basis points and 1 year SBI MCLR of 7.00% as on 1.4.2021 + 350 basis points). 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/Lignite for stock (A)	10723.19	10723.19	10723.19	10723.19	10723.19
Working capital for cost of Coal/Lignite for generation (B)	16084.79	16084.79	16084.79	16084.79	16084.79
Working capital for cost of oil for 2 months (C)	262.50	261.79	261.79	261.79	262.50
Working capital for fuel cost (D)	0.00	0.00	0.00	0.00	0.00
Working capital for liquid fuel Stock (E)	0.00	0.00	0.00	0.00	0.00
Working capital for O & M expenses (1 month) (F)	2049.72	2124.16	2201.52	2281.83	2364.29
Working capital for Maintenance spares (20% of O&M) (G)	4919.34	5097.98	5283.65	5476.40	5674.30
Working capital for Receivables (45 days) (H)	12997.12	12825.73	12621.37	12477.18	12297.64
Total Working Capital (I) = [(A+B+C+D+E+F+G+H)]	**47036.66**	**47117.63**	**47176.31**	**47305.19**	**47406.71**
Rate of Interest (J)	12.05%	11.25%	10.50%	10.50%	10.50%
Total Interest on Working capital (K) = [(I)*(J)]	**5667.92**	**5300.73**	**4953.51**	**4967.05**	**4977.70**

Annual Fixed Charges

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

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	27708.29	27747.18	27768.11	27768.11	27768.11
Interest on Loan	15005.32	12732.21	10449.37	8302.47	6108.40
Return on Equity	30753.55	30793.55	30816.77	30816.85	30816.96
Interest on Working Capital	5667.92	5300.73	4953.51	4967.05	4977.70
O&M Expenses	24596.68	25489.88	26418.24	27382.01	28371.48
Total annual fixed charges	**103731.76**	**102063.55**	**100406.00**	**99236.49**	**98042.65**

Application filing fees and Publication charges

88. The Petitioner has sought 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 view of the above, 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.

89. 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.

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

91. Annexure-I given hereinafter shall form part of the order.

92. Petition No. 418/GT/2020 is disposed of in terms of the above.

Sd/-	***Sd/-***	***Sd/-***
(Pravas Kumar Singh)	**(I.S.Jha)**	**(P.K. Pujari)**
Member	**Member**	**Chairperson**

Annexure-I

Depreciation for the 2019-24 tariff period

(Rs. in lakh)

Sl. No	Name of the Assets	Gross Block as on 31.4.2019	Depreciation rates as per Commission specified rate schedule	Depreciation
1	Land under full ownership	0.00	0.00%	0.00
2	Land under lease	0.00	3.34%	0.00
3	Roads, bridges, culverts etc.	4778.62	3.34%	159.61
4	Buildings	61543.09	3.34%	2055.54
5	Temporary erections	16.73	100%	16.73
6	Water supply, drainage & sewerage system	354.17	5.28%	18.70
7	Plant & Machinery	499933.03	5.28%	26396.46
8	MGR track & signaling system	294.77	5.28%	15.56
9	Railway siding	11195.34	5.28%	591.11
10	Earth dam reservoir	0.00	5.28%	0.00
11	Construction equipment	309.98	5.28%	16.37
12	Office furniture & furnishing	703.57	6.33%	44.54
13	Office equipment	527.38	6.33%	33.38
14	Hospital equipments	36.66	5.28%	1.94
15	IT equipments	596.21	15.00%	89.43
16	Self-propelled vehicles (Vehicles including speed boats)	7.84	9.50%	0.74
17	Electrical installations	514.66	6.33%	32.58
18	Communication equipments	146.37	6.33%	9.27
	Total	**580812.05**		**29481.96**
	Weighted Average Rate of Depreciation (%)			**5.0760**

**Calculated as per rate of depreciation in Appendix-II of the 2019 Tariff Regulations.*