CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 411/GT/2020

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

Date of Order: 30th May, 2023

IN THE MATTER OF

Petition for approval of tariff of Vallur Thermal Power Station (1500 MW) for the period from 1.4.2019 to 31.3.2024.

And

In the matter of:

NTPC Tamil Nadu Energy Company Limited,
No. 123, G- Block, Anna Nagar (East),
Chennai- 600102 **.....Petitioner**

Vs

1. A.P. Transmission Corporation Limited,
   Vidyut Soudha, Khairatabad,
   Hyderabad - 500 082.

2. A. P. Eastern Power Distribution Company Limited,
   P&T Colony, Seetammadhara,
   Vishakapatnam - 503 013

3. A.P. Southern Power Distribution Company Limited,
   D.NO:19-13-65/A Srinivasapuram,
   Tiruchanoor Road Tirupathi- 517 501

4. Transmission Corporation of Telangana Limited,
   Vidyut Soudha Khairatabad,
   Hyderabad - 500 082

5. Telangana State Southern Power Distribution Limited,
   2nd Floor, H. No. 6-1-50, Mint Compound,
   Hyderabad-500 063

6. Telangana Northern Power Distribution Company Limited,
   H.No. 2-5-31/2, Vidyut Bhavan,
   Nakkalagutta, Hanamkonda,
   Warangal - 506 001

7. Power Company of Karnataka Limited,
   KPTCL Complex, Kaveri Bhawan,
   Bangalore - 560 009

8. Bangalore Electricity Supply Company Limited,
   Krishna Rajendra Circle, Bangalore-506 001

9. Mangalore Electricity Supply Company Limited
   MESCOM Bhavana, Corporate office,
   Bajai Kevai Cross Road, Mangalore-575 004

10. Chamundeshwari Electricity Supply Company Limited,
    Corporate Office No. 29, Ground Floor,
    Kaveri Grameena Bank, Vijayanagar,
    2nd Stage, Mysore - 570 017

11. Gulbarga Electricity Supply Company Limited,
    Main Road, Gulbarga, 585102

12. Hubli Electricity Supply Company Limited,
    Corporate office, P.B. Road, Navanagar,
    Hubli - 580 025

13. Kerala State Electricity Board Limited,
    Tariff & Regulatory Cell,
    Vaidyuthi Bhavanam, Pattom
    Thiruvananthapuram - 695 004

14. Tamil Nadu Generation & Distribution Corporation Limited,
    Mechanical/Regulatory Cell,
    NPKRR Maaligai, 144, Anna Salai,
    Chennai - 600 002

15. Electricity Department,
    Government of Puducherry,
    137, NSC Bose Salai,
    Puducherry-605 001 **….Respondents**

Parties Present:

Ms. Swapna Seshadri, Advocate, NTECL
Shri Anand K. Ganesan, Advocate, NTECL
Ms. Ritu Apurva, Advocate, NTECL
Ms. Ashabari Thakur, NTECL
Shri Deepak Thakur, NTECL

Shri S. Vallinayagam, Advocate, TANGEDCO
Shri B. Rajeswari, TANGEDCO
Shri R. Ramalakshmi, TANGEDCO
Ms. R. Alamelu, TANGEDCO

ORDER

This Petition has been filed by the Petitioner, NTPC Tamil Nadu Energy Company Limited (NTECL) for determination of tariff of Vallur Thermal Power Station (1500 MW) (in short "the generating station") for the period 2019-24, in accordance with the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (in short "the 2019 Tariff Regulations").

Background

2. The investment approval of the project was accorded on 14.7.2007 by the Board of the Petitioner's Company for Stage-I, Phase-I comprising of two units of 500 MW at a cost of Rs.5552.78 crore and Phase-II comprising of one unit of 500 MW at a cost of Rs.3086.78 crore was accorded on 19.5.2009. The Petitioner has entered into Power Purchase Agreement (PPA) with the Respondents herein for supply of power generated from the project to the respondents in terms of the allocation made by the Ministry of Power, Government of India vide letter dated 28.9.2010.

3. The generating station with a capacity of 1500 MW comprises of two units of 500 MW each in Phase-I and one unit of 500 MW in Phase-II. The dates of commercial operation of the units of the generating station are as under:

Unit-I	29.11.2012
Unit-II	25.08.2013
Unit-III	26.02.2015

4. The Commission vide order dated 20.3.2023 in Petition No. 576/GT/2020, had trued up the tariff of the generating station for the period 2014-19. Accordingly, the

capital cost and annual fixed charges allowed vide order dated 20.3.2023 in Petition No. 576/GT/2020, are as under:

Capital Cost allowed

(Rs. in lakh)

	2014-15	2014-15	2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.02.2015	**26.2.2015 to 31.3.2015**				
Opening Capital Cost	558876.17	827217.36	827401.13	858979.60	891431.98	920992.26
Less: IDC/FC/FERV claimed as on Unit-III COD	0.00	58051.10	0.00	0.00	0.00	0.00
Less: Notional IDC included in capital cost claimed	0.00	1241.76	0.00	0.00	0.00	0.00
Add: IDC allowed on COD of Unit-III	0.00	51969.73	0.00	0.00	0.00	0.00
Add: FC allowed on COD of Unit-III	0.00	372.24	0.00	0.00	0.00	0.00
Add: FERV allowed on COD of Unit-III	0.00	235.62	0.00	0.00	0.00	0.00
Add: Notional IDC allowed	0.00	435.75	0.00	0.00	0.00	0.00
Less: pro-rata reduction in IEDC	0.00	1520.23	0.00	0.00	0.00	0.00
Less: Pro-rata reduction in two packages	0.00	50.96	0.00	0.00	0.00	0.00
Less: LD Recovered	0.00	805.63	0.00	0.00	0.00	0.00
Less: Revenue of sale from Infirm Power	0.00	0.00	0.00	0.00	0.00	0.00
Less: Excess initial spares disallowed	0.00	0.00	0.00	0.00	0.00	0.00
Total Opening cost	**558876.17**	**818561.02**	**827401.13**	**858979.60**	**891431.98**	**920992.26**
Add: Additional capital expenditure	71.03	1810.95	18,449.38	24126.15	25889.98	11729.70
Add: Liabilities discharged	8103.17	7029.16	13129.69	8328.16	5139.29	5,352.09
Less: De-capitalization	0.00	0.00	0.59	1.93	0.00	3076.98
Less: Exclusions disallowed	0.00	0.00	0.00	0.00	1468.99	509.68
Closing capital cost	**567050.37**	**827401.13**	**858979.60**	**891431.98**	**920992.26**	**934487.39**

Annual Fixed Charges allowed

(Rs. in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.20215	**26.2.2015 to 31.3.2015**				
Depreciation	25610.20	3864.76	42548.75	44154.94	45592.77	46532.94
Interest on Loan	37188.96	5583.98	55044.54	47762.71	45432.96	42340.60
Return on Equity	23010.14	3518.13	39208.35	51737.79	53570.73	54990.85
Interest on Working Capital	8772.82	1339.93	14454.57	14694.97	15068.04	15163.80
O&M Expenses	14912.47	2202.48	25442.45	26982.47	28879.72	30691.66
Total	**109494.58**	**16509.27**	**176698.65**	**185332.37**	**188544.22**	**189719.85**

Present Petition

5. The capital cost and annual fixed charges claimed by the Petitioner for the period 2019-24, in the present petition, in accordance with Regulation 9(2) of the 2019 Tariff are as under :

Capital Cost claimed

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

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Opening capital cost	938573.68	938662.68	940635.68	942306.68	942306.68
Add: Addition during the year/ period	89.00	1973.00	1671.00	-	22280.00
Less: De-capitalization during the year/ period	-	-	-	-	-
Less: Reversal during the year/ period	-	-	-	-	-
Add: Discharges during the year/ period	-	-	-	-	-
Closing capital cost	**938662.68**	**940635.68**	**942306.68**	**942306.68**	**964586.68**
Average capital cost	938618.18	939649.18	941471.18	942306.68	953446.68

(b) *Capital cost eligible for Return on Equity at weighted average rate of interest*:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Opening capital cost	-	-	5080.00	5317.00	5317.00
Add: Addition during the year/ period	-	5080.00	237.00	-	-
Less: De-capitalization during the year/ period	-	-	-	-	-
Less: Reversal during the year/ period	-	-	-	-	-
Add: Discharges during the year/ period	-	-	-	-	-
Closing capital cost	**-**	**5080.00**	**5317.00**	**5317.00**	**5317.00**
Average capital cost	-	2540.00	5198.50	5317.00	5317.00

Annual Fixed Charges claimed

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	47009.75	47188.60	47413.00	47460.78	48018.72
Interest on Loan	39494.19	35122.47	30772.04	26138.98	22171.89
Return on Equity	52887.38	53037.77	53237.45	53289.22	53917.29
Interest on Working Capital	15883.34	15897.53	15907.96	15911.59	15935.83
O&M Expenses	37705.00	39058.45	40458.62	41906.19	43386.22
Total	**192979.67**	**190304.83**	**187789.07**	**184706.77**	**183429.95**

6. The Respondents TANGEDCO and KSEBL have filed their replies vide affidavits dated 14.9.2020 and 20.7.2021, respectively. The Petitioner has filed its rejoinder to the above said replies vide affidavit dated 5.4.2021 and 27.8.2021 respectively. The Petitioner has also filed certain additional information on 5.2.2021, 17.6.2021, 30.6.2021, and 17.2.2022. The Petition was heard on 30.11.2021 and the Commission, after hearing the parties, reserved its order in the Petition. However, as order in the Petition could not be issued, prior to the then Chairperson Shri P.K. Pujari demitting office, this Petition was re-listed and heard through virtual hearing on 10.8.2022, and the Commission reserved its order in the petition. Based on the submissions of the parties and the documents available on records and on prudence check, we proceed to examine the claims of the Petitioner, in this Petition, for determination of tariff for the period 2019-24, as stated in the subsequent paragraphs.

Capital Cost

7. Clause (1) of Regulation 19 of the 2019 Tariff Regulations provides that the capital cost as determined by the Commission after prudence check, in accordance with this Regulation, shall form the basis of determination of tariff for existing and new projects. Clause 3 of Regulation 19 of the 2019 Tariff Regulations provides as under:

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

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

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

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

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

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

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

8. The annual fixed charges claimed by the Petitioner, is based on the opening capital cost of Rs. 938573.68 lakh, as against the closing capital cost of Rs 934487.39 lakh on cash basis, as on 31.3.2019, allowed vide order dated 20.3.2023 in Petition No. 576/GT/2020. Accordingly, in terms of Regulation 19(3) of the 2019 Tariff Regulations, the capital cost of Rs.934487.39 lakh, on cash basis, has been considered as the opening capital cost as on 1.4.2019.

Additional Capital Expenditure

9. Regulation 25 and Regulation 26 of the 2019 Tariff Regulations, provides that the determination of tariff shall be based on admitted capital cost, including any additional capital expenditure already admitted up to 31.3.2019 (either based on actual or projected additional capital expenditure) and estimated additional capital expenditure for the respective years of the period 2019- 24. Clauses (1) and (2) of Regulation 25 and Regulation 26 of the 2019 Tariff Regulations, provides as under:

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

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

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

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

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

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

(e) Force Majeure events;

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

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

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

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

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

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

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

26. Additional Capitalization beyond the original scope

(1) The capital expenditure, in respect of existing generating station or the transmission system including communication system, incurred or projected to be incurred on the following counts beyond the original scope, may be admitted by the Commission, subject to prudence check:

(a) Liabilities to meet award of arbitration or for compliance of order or directions of any statutory authority, or order or decree of any court of 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 Modernization (R&M) or repairs and maintenance under O&M expenses, the same shall not be claimed under this Regulation;

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

(2) In case of de-capitalization of assets of a generating company or the transmission licensee, as the case may be, the original cost of such asset as on the date of decapitalization shall be deducted from the value of gross fixed asset and corresponding loan as well as equity shall be deducted from outstanding loan and the equity respectively in the year such de-capitalization takes place with corresponding

adjustments in cumulative depreciation and cumulative repayment of loan, duly taking into consideration the year in which it was capitalized."

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

(Rs. in lakh)

Sl. No.	Head of Work/Equipment	Regulation	2019-20	2020-21	2021-22	2022-23	2023-24
A.	**Works within original scope, change-in-law etc. eligible for ROE at Normal Rate**						
1.	Ash Dyke lagoon-1/ Ash Handling related works	25(1)(c) read with 25(1)(g)	-	-	-	-	14004.00
2.	Ash Dyke lagoon-2, 1st Raising	25(1)(c) read with 25(1)(g)	-	-	-	-	8000.00
3.	HFO/LDO conversion	26(1)(b)	-	52.00	-	-	-
4.	Online Coal Analyzer	26(1)(b)	-	67.00	-	-	-
5.	Dust Suppression system for Ash Dyke- Lagoon	26(1)(b)	-	-	323.00	-	276.00
6.	Segregation of plant drains	26(1)(b)	86.00	-	-	-	-
7.	Dust extraction system of Crusher house & Coal Yard sprinkling system in CHP	25(1)(d)	-	461.00	-	-	-
8.	Bio-degradable waste management / Hazardous Waste Management Facility	26(1)(b)	3.00	276.00	-	-	-
9.	Scrap Yard for steel waste	26(1)(b)	-	117.00	-	-	-
10.	Electro chlorination system in CWPH	26(1)(b) and 26(1)(d)	-	1000.00	1348.00	-	-
	Sub-Total (A)		**89.00**	**1973.00**	**1671.00**	**-**	**22280.00**
B.	**Works beyond Original scope excluding add-cap due to Change in Law eligible for RoE at WAROI**						
1.	Desalination, Remineralization Ultrafiltration package	26(1)(c)	-	4880.00		-	-
2.	Works for enhancing security	26(1)(d)	-	200.00	237.00	-	-
	Sub- Total (B)		**-**	**5080.00**	**237.00**	**-**	-
	Total Additional capital expenditure claimed (A+B)		**89.00**	**7053.00**	**1908.00**	**-**	**22280.00**

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

Ash Dyke/ Ash Handling related works (Lagoon-1 and Lagoon-2 Raising)

12. The Petitioner has claimed projected additional capital expenditure of Rs.14004.00 lakh towards Ash dyke lagoon-1 and Rs.8000.00 lakh towards Ash dyke lagoon-2 and raising works, in 2023-24, 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 expenditures are planned Ash handling/ Ash related works, which are carried out continuously during the operational life of the generating station. The Petitioner has further submitted that as per the approved scheme, these works are part of the original scope of work and are planned in a phased manner, based on the expected quantum of works to be executed during the period 2019-24.

13. The submissions have been considered. It is noticed that the Petitioner, in Form 5B, of Petition No. 576/GT/2014 (truing up of tariff for 2014-19), had submitted that the original estimated cost for Ash related work is Rs.22673.00 lakh, as per Original Investment approval dated 14.7.2007. Accordingly, the Petitioner vide affidavit dated 22.9.2022 revised Form-5B, wherein, it had submitted that the same was revised vide RCE-II, to Rs. 22199.00 lakh. The Petitioner, in the revised Form-5B has submitted that Rs 19755.56 lakh has been incurred up to 31.3.2019 and the same has been duly considered vide order dated 20.3.2023 in Petition No. 576/GT/2020. According to the Petitioner, the total additional capital expenditure allowed for Ash related works till 31.3.2019 was Rs. 19755.56 lakh. Further, the Petitioner, in revised Form-5B, has also claimed the amount of Rs 20.25 lakh for Ash handling system (which appears to have been included in the above cost of Rs 19755.56 lakh) and Rs 9501.91 lakh towards Ash disposal area development, as on 31.3.2019. The Petitioner, in the present petition, has claimed projected total expenditure of Rs 22004.00 lakh during 2023-24 (i.e. Rs 14004.00 lakh for Ash Dyke lagoon-1/ Ash Handling related works and Rs 8000.00 lakh

for Ash Dyke lagoon-2, 1st Raising).

14. 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, 2020-21 and 2021-22 that the entire generating station (i.e., 1500 MW) has been meeting the fly ash utilization target as follows:

Year	Fly ash generation (MT)	Fly ash Utilization (MT)	Utilization (%)
2017-18	1.8730	1.2180	65.03
2018-19	2.2570	1.5250	67.57
2019-20	1.7450	2.1120	121.03
2020-21	1.2767	1.5680	122.80
2021-22	2.4466	1.9107	78.10

15. It is further observed from the CEA/NPP Reports and SRPC Annual Reports, the Plant Load Factor (PLF) for entire generating station (i.e.1500 MW) is as under:

Year	PLF (%)
2015-16	58.57
2016-17	70.10
2017-18	54.55
2018-19	58.65
2019-20	43.07
2020-21	33.25
2021-22	81.68

16. The total cost approved as per RCE-II as submitted by the Petitioner, in Form-5B, is Rs 22199.00 lakh and Rs 19755.56 lakh has already been allowed to the generating station for the period 2014-19. It could be seen from above trend that the Petitioner is mostly meeting the ash utilization target of 100% and the PLF of the generating station is very low except for the period 2021-22. In view of the above, we restrict the claim of the Petitioner to the RCE cost of Rs 22199.00 lakh. Accordingly, the projected additional cost allowed for the period 2023-24 towards Ash handling system is restricted to Rs 2443.44 lakh (Rs. 22199 lakh – Rs. 19755.56 lakh). However, the Petitioner is directed

to furnish the complete details of the expenditure incurred towards Ash dyke/ Ash handling system, ash disposal area development (raising of lagoon–I and lagoon-II) along with the total cost envisaged towards these expenditure as per the original investment approval/ revised approval, at the time of truing up of tariff. The Petitioner is also granted liberty to approach the Commission, with full details and justification, for claiming the additional expenditure related to Ash Dyke / Ash disposal expense, if any, at time of truing up

Heavy Fuel Oil to Light Diesel Oil conversion

17. The Petitioner has claimed projected additional capital expenditure of Rs.52.00 lakh in 2020-21, towards conversion from Heavy Fuel Oil (HFO) to Light Diesel Oil (LDO), under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification for the same, the Petitioner has submitted that the Hon'ble Supreme Court of India vide its order dated 24.10.2017 in Writ Petition (Civil) No 13029/1985 has banned use of Furnace Oil in the States of UP, Haryana and Rajasthan and has ordered switching to LDO in thermal power plants. In view of this, the Petitioner has stated that it has taken up the fuel system conversion in its various power stations.

18. The Respondent TANGEDCO has submitted that the additional capital expenditure may be allowed after prudence check. The Respondent KSEBL has submitted that the expenditure beyond the original scope of work may be disallowed.

19. We have considered the matter. It is noticed that the additional capital expenditure claimed by the Petitioner, is in terms of the order dated 24.10.2017 of the Hon’ble Supreme Court in Writ Petition Civil No.13029/1985 wherein, the application of the Petitioner to use alternate fuels such as Low Sulphur Heavy Stock (LSHS) or LDO was

allowed as under:

> *"The prayer in this application is to allow the National Thermal Power Corporation Ltd. To use alternate fuels such as Low Sulphur Heavy Stock (LSHS) along with Light Diesel Oil (LDO) in consonance with the order dated 13.12.2017 in substitution of Furnace Oil. The learned Amicus has no objection to the application being allowed. The applications are allowed."*

20. In view of above, the projected additional capital expenditure of Rs. 52.00 lakh in 2020-21 for asset/work relating to HFO to LDO conversion is **allowed** under Regulation 26(1)(b) of the 2019 Tariff Regulations. The Petitioner is directed to furnish the de-capitalized value of existing asset which is being converted/replaced by LDO system, at the time of truing up. The Petitioner is also directed to furnish the savings in respect of auxiliary power consumption and station heat rate as HFO heating system shall not be required when LDO system is in use by the generating station.

Online Coal Analyzer

21. The Petitioner has claimed projected additional capital expenditure of Rs.67.00 lakh, towards Online coal analyzer in 2020-21, under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has furnished copy of the OM (office memorandum) dated 26.8.2015 from MOEF&CC, which mandates 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 1350 km from the linked mines and it also sources coal from other mines, under flexible coal utilization scheme, it is obligated to

incur the expenditure for installation of 'Online coal analyzer' to comply with the MOEF&CC directions and has prayed that claim may be allowed under change in law.

22. 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%. Further, MOEF &CC vide its gazette notification dated 21.5.2020 had permitted use of coal by Thermal Power Plants, without stipulations as regards ash content or distance. However, it is seen that the said notification dated 21.5.2020 has been issued by MOEF&CC after the capital expenditure has been carried by the Petitioner. In this background and since the generating station is located at about 1350 km from the linked mines, the projected additional capital expenditure claimed by the Petitioner on this count is **allowed** under Regulation 26(1)(b) of the 2019 Tariff Regulations.

Dust Suppression system for Ash Dyke- Lagoon

23. The Petitioner has claimed projected additional capital expenditure of Rs.323.00 lakh in 2021-22 and Rs. 276.00 lakh in 2023-24, towards Dust Suppression system for Ash Dyke- Lagoon, under Regulation 26(1)(b) of the 2019 Tariff Regulations. In support of the same the Petitioner has submitted that the discharge of Ash to Dyke should be in slurry form only and it has to provide an adequate water cover to maintain the Ash Dyke to prevent fugitive emission. The Petitioner further submitted the Tamil Nadu Pollution Control Board (TNPCB) vide letter dated 29.6.2018, has directed the Petitioner to stop the work related to construction of Ash dyke Lagoon-I pertaining to the generating station and has directed the Petitioner to furnish the following information:

a. The unit shall earmark the location of the proposed Ash dyke lagoon-I

incorporating its dimension and other salient feature in the approved CRZ (Coastal Regulatory Zone) map.

b. The unit shall earmark the boundary of HTL, HTL + 100 M Line of CRZ.

c. The unit shall furnish the design details of the proposed construction of ash dyke lagoon-I and also furnish the details on the safe handling and disposal of dredged material from the proposed ash dyke lagoon-I.

24. It is noticed that TNPCB has subsequently permitted the Petitioner to resume the work for construction of Ash dyke lagoon-I, subject to the above mentioned conditions including that the unit shall ensure the discharge of ash to the dyke in the slurry form only and also to provide an adequate water cover to maintain the ash dyke to prevent fugitive emission. Keeping in view of the directions of TNCPB, the expenditure of Rs.323.00 lakh in 2021-22 and Rs. 276.00 lakh in 2023-24 incurred on account of Dust Suppression system is **allowed**.

Segregation of plant drains

25. The Petitioner has claimed projected additional capital expenditure of Rs. 86.00 lakh in 2019-20, towards segregation of plant drains, under Regulation 26(1)(b) of the 2019 Tariff Regulations. In support of the same, the Petitioner has submitted that as per the direction of TNPCB in the Consent to Operate (CTO), clause-5 of General Conditions of works, the Petitioner is required to separate plant drains with storm water drains before upstream of terminal manholes. The Petitioner has also furnished the TNPCB Consent Order No. 22863 (Expansion) dated 1.12.2014 for expansion / discharge of sewage and trade effluent under section 25 of the water (Prevention and Control of Pollution) Act, 1974, wherein, clause 5 of the general conditions is as under:

> *"Storm water shall not be allowed to mix the sewage and / or trade effluent on the upstream of the terminal manholes where the flow measuring device may be installed."*

26. We have considered the matter. The State Pollution Control Board ensures the safety and security of the people and plant and accordingly issues directions to the new generating stations, which needs to be adhered to for the smooth and safe running of the generating station. However, the consent to operate is a general condition of work which is applicable to each and every generating station and the issuance of such direction is a primary condition to run the generating station by the project developer. In our view, the segregation of plant drains is a general condition under consent to operate and is a basic necessity. The general conditions under consent to operate already form part of the original investment approval and cannot be a change in law event to claim the expenditure. Accordingly, the additional capital expenditure on this count is **not allowed.**

Dust extraction system for crusher house & Coal yard sprinkling system

27. The Petitioner has claimed additional capital expenditure of Rs. 461.00 lakh in 2020-21, towards dust extraction system for crusher house & coal yard sprinkling system, under Regulation 25(1)(d) of the 2019 Tariff Regulations. The Petitioner, in justification of the same, has submitted that these works/packages pertain to the original scope of work and the same have been already completed within the cut-off date of the generating station. It has however stated that on account of non-closure of the contract in view of various reasons like final settlement of bill, defect rectification, price adjustment as per the contract, these balance amounts are still to be released. The Petitioner has further submitted that most of these deferred liabilities are proposed to be released during the years 2019-20 and 2020-21, during the contract closure.

28. We have considered the submissions and the documents on record. The Petitioner

has claimed the additional expenditure under Regulation 25(1)(d) of the 2019 Tariff Regulations. Though the Petitioner has claimed the said expenditure due to non-closure of the contract (due to final settlement of bill, defect rectification, price adjustment as per the contract), it has not submitted the details of the total awarded cost and the cost variation thereof. In view of this, the claim of the Petitioner, on this count is **not allowed**. However, the Petitioner is at liberty to approach the Commission with the details at the time of truing up of tariff.

Bio-degradable waste management / Hazardous Waste Management Facility

29. The Petitioner has claimed projected additional capital expenditure of Rs. 3.00 lakh in 2019-20 and Rs. 276.00 lakh in 2020-21, towards Bio-degradable waste management/ Hazardous Waste Management Facility, under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that in line with the TNPCB norms for site storage requirements, a containment system is to be provided at the area of storage. It has stated that the system should be designed to drain and remove liquids and to avoid contact from the accumulated soils and accordingly, the station should not store hazardous waste on the open ground. The Petitioner has submitted that hazardous waste shall be stored in closed containers in an isolated area earmarked for the purpose within the premises and the containers holding the hazardous wastes should be kept in good condition and made of materials which can withstand the physical and environmental conditions during storage and transportation. In support of the same, the Petitioner has submitted the letter dated 15.4.2014 issued by TNPCB, for operating a facility for Collection/Storage/Transport and disposal of hazardous waste, under Rule 3(b) and 5(4) of Hazardous Wastes (Management, Handling and Transboundary movement) Rules, 2008 enacted under

Environment (Protection) Act, 1986 wherein the onsite general storage requirements were mentioned.

30. Since, the claim for Rs. 3.00 lakh in 2019-20 and Rs. 276.00 lakh in 2020-21, towards Bio-degradable waste management/ Hazardous Waste Management Facility is as per recommendations of the TNPCB, the additional capital expenditure claimed is **allowed** under Regulation 26(1)(b) of the 2019 Tariff Regulations**.**

Scrap Yard for Steel waste

31. The Petitioner has claimed projected additional capital expenditure of Rs. 117.00 lakh in 2020-21, towards Scrap Yard for Steel waste, under Regulation 26(1)(b) of the 2019 Tariff Regulations. In justification of the same, the Petitioner has submitted that TNPCB vide letter dated 4.9.2018 has issued certain instructions for the generating station. It has stated that one of the instructions was that the unit shall ensure that the soil or other construction materials arising due to the construction shall not be stored or disposed in CRZ (Coastal Regulation Zone) area. The Petitioner has stated that it has to prepare a separate scrap yard for the plant scrap to store it in isolation. In view of the submissions and since the expenditure claimed is based on the recommendation of TNPCB, the claim of the Petitioner, on this count, is **allowed** under Regulation 26(1)(b) of the 2019 Tariff Regulations**.**

Electro chlorination system in CWPH

32. The Petitioner has claimed projected additional capital expenditure of Rs.2348.00 lakh (Rs.1000.00 lakh in 2020-21 and Rs.1348.00 lakh in 2021-22), towards 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 the CLO2 Plant is being installed to enable a much safer way of producing CLO2 on site, by use of commercial grade HCl and sodium chlorite, instead of present practice of Chlorine gas, being dozed directly. It has stated that Chlorine gas is very hazardous and may prove fatal in case of leakage and handling & storage of same involves risk to the life of public at large and in the interest of public safety, the chlorine dozing system is now being replaced by CLO2 system, which is much safer and less hazardous than chlorine. The Petitioner has also submitted that it has taken up the installation of CLO2 Plant in line with the provisions of "National Policy on Safety, Health and Environment at Workplace" released by the Ministry of Labour and Employment, GOI in February, 2009. The relevant clauses of the policy pertinent to the case of the Petitioner requiring installation of Electro Chlorination System to meet the policy provisions are as under:

> *"Clause 1.3*
> *……..Government is committed to regulate all economic activities for management of safety and health risks at workplaces and to provide measures so as to ensure safe and healthy working conditions for every working man and woman in the nation. Government recognizes that safety and health of workers has a positive impact on productivity and economic and social development. Prevention is an integral part of economic activities."*
> *Clause 1.8*
> *The increasing use of chemicals, exposure to physical, chemical and biological agents with hazard potential unknown to people; the indiscriminate use of agro-chemicals including pesticides, agricultural machineries and equipment; industries with major accident risks; effects of computer-controlled technologies and alarming influence of stress at work in many modern jobs pose serious safety, health and environmental risks.*
>
> *Clause 1.9:*
> *"The fundamental purpose of this National Policy on Safety, Health and Environment at workplace, is not only to eliminate the incidence of work-related injuries, diseases, fatalities, disaster and loss of national assets and ensuring achievement of a high level of occupational safety, health and environment performance through proactive approaches but also to enhance the well-being of the employee and society, at large. The necessary changes in this area will be based on a coordinated national effort focused on clear national goals and objectives."*

33. The Petitioner has further submitted that its generating stations have hundreds of

workmen engaged round the clock and in order to improve the safety practices and mitigate the hazards in line with the statutory provisions on safety, health and environment at workplace. As evident from the above quoted clauses of the said National policy, the Petitioner has submitted that the installation of Electro Chlorination System is in accordance with various provisions of the said policy to ensure a safe workplace. It is also submitted by the Petitioner that the "Draft Safety, Health and Working Conditions Code 2018" was put up by the Ministry of Labour and Employment in March 2018 inviting comments/suggestions of various stakeholders, wherein responsibilities of various faculties of industries/factories were mentioned including the employer. It is further submitted by the Petitioner that as a responsible employer, it took cognizance of the hazardous nature of chlorine gas dosing and decided to replace the earlier chlorine dozing system by a much safer Chlorine Dioxide (ClO_2) system in its generating station.

34. The matter has been considered. The Petitioner has referenced the draft Safety, Health and Working Conditions Code 2018, which is not finalized yet and is in the inception stage. The "National Policy on Safety, Health and Environment at Workplace" was issued on February 2009 and commercial operation dated of the generating station is 26.2.2015. Accordingly, cutoff date of the generating station is 31.3.2018. Further, the Petitioner has failed to justify its claim towards electro chlorination system under change in law. Accordingly, we are not inclined to allow the said expenditure under Regulation 26(1)(b) of the 2019 Tariff Regulations. 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 to the generating station, as regards the requirement of replacement of the item i.e. (chlorine dozing system to be

replaced by Chlorine Dioxide (ClO2) system) for safety and security of the generating station. In this background, the projected additional capital expenditure claimed by the Petitioner on this count is **not allowed** under Regulation 26(1)(b) and Regulation 26(1)(d) of the 2019 Tariff Regulations**.**

Desalination, Remineralization and Ultrafiltration package

35. The Petitioner has claimed projected additional capital expenditure of Rs.4880.00 lakh in 2020-21, towards Desalination, Remineralization and Ultrafiltration package under Regulation 26(1)(c) of the 2019 Tariff Regulations. The Petitioner, in justification of the same, has submitted that the generating station is a coastal plant and has been designed based on sea water desalination, without any input of natural sweet water, for producing the entire process and service water. It has stated that the existing system has 3 streams of Desalination plant the output of which is permeate water through Sea water Reverse Osmosis (SWRO)and this permeate water (output water of desalination plant) is the source for further producing process water through DM plant and other service water for the station. The Petitioner has stated that unlike other desalination plants which draw water from deep inside the sea to get clean water, the intake raw water for this desalination plant is from Ennore port basin through State power plant water intake channel.

36. The Petitioner has further submitted that due to increase in traffic of Ships and dredging activities the turbulence created in the input water from Ennore port basin is having high fine silt content and deteriorated Water quality parameters in comparison to design like Biological oxygen demand (BOD), Chemical Oxygen demand (COD) and Total Organic carbon (TOC). It has resulted in frequent fouling and failures of SWRO membranes leading to desalination streams/plant shutdown, running of all three

streams at full capacity with no standby, reduction in generation, forced shutdown of units etc. The Petitioner has also submitted that due to chemical treatment of permeate water (RO water output) for making it fit for use in firewater, service water etc. its characteristics becomes corrosive as it is deficient in calcium and alkalinity & high in chloride content. This corrosive nature has resulted in high corrosion in MS pipes used for service/fire water system. The Petitioner, in order to overcome these difficulties, in running of desalination system, after detailed study at the generating station, has planned to install ultra-filtration system for reducing breakdowns, Re-mineralization for reducing corrosive nature of output water and 4th RO stream for making standby stream available for increasing reliability and maintenance of system. The Petitioner further submitted that it has decided to carry out these jobs in order to increase the life of Desalination system as well as to get the desired quality of water for plant operation.

37. The Petitioner has also submitted that as the above-mentioned schemes are not part of original scope of works therefore approval was taken by the Board of NTECL comprising of NTPC and TANGEDCO (having 70.7% power allocation and 50% JV partner). Based upon above, Desalination & Re-mineralization package was awarded in May 2016 and ultrafiltration package on March, 2017. The Petitioner also submitted that these works are in advance stage of completion and are expected to be capitalized by the end of 2020-21. The system wise work details are as below:

(a) Ultrafiltration system

38. The Petitioner has submitted that the generating station is facing several operational problems such as high DP, low output across RO System as the sea water characteristics deteriorated with the distribution of suspended particles like silt etc.

changed with fine particles becoming predominant. During testing of sea water for silt content it was observed that silt percentage was quite high for the silt size 1 to 5 microns (42.5%- 45.5%) and 0.1 to 1 micron (9.7%-11.8%) in make-up water due to disturbance in sea bed caused by increased Ship Vessels Traffic and dredging activities in and around the Ennore Port, resulting in frequent shutdown of RO plant. The Petitioner has furnished the sea water analysis and report of external agency M/s. Volvika Enviro system regarding the suspended particle size. The Petitioner has further submitted that in order to overcome the said issue, the Petitioner has installed 1-micron cartridge filters in place of 5-micron cartridge filters, but the same has not provided the desired results as fine silt below 1 micron are not captured by existing Lamella clarifier and filters and the silt has passed on to the RO membranes. This has resulted in an adverse effect on life of RO membranes such as rapid increase of differential pressure of newly installed membranes and less flow from RO stream. The Petitioner has also submitted that in order to resolve the above issue, a committee has been formed to study the issue. Based on the study including study of other successfully running sea water RO plant (Nemelli-Chennai) where ultra-filtration plant is installed to remove particles up to 0.1 micron, it was concluded that Ultra filtration to be installed after HPSF to remove the particles below 1-micron size to increase membrane life and also increase the permeate water output throughout the membrane life of the RO.

(b) Additional standby RO Stream

39. The Petitioner has submitted that as per the design 3 SWRO streams are provided in the generating station to cater the requirement of DM Water, Service Water, Fire Water, Potable water etc. Even though the designed capacity through each stream is 275 M^3/Hr (permeate flow), over a period of time due to scaling and fouling permeate

flow reduced from 275 M³/Hr to approx. 200 M³/Hr. The Petitioner has also submitted that the scaling and fouling of desalination plant increased considerably due to the increased impurities and change in sea water quality as evident from the sea water test results due to various reasons as explained above. It has further submitted that the increase in BOD, COD and TOC indicating poor sea water quality in comparison to design sea water, were not envisaged at designing stage. The sea water characteristics deteriorated with contaminants, are as shown below:

Parameter indicating sea water quality	Unit	Design value for sea water inlet	Measured value for sea water inlet
Biological oxygen demand (BOD)	mg/litre	5	Up to 10
Chemical Oxygen Demand (COD)	mg/litre	40	Up to 120
Total Organic Carbon (TOC)	PPM of C	2.4-2.84	Up to 28

40. The Petitioner has further submitted that for maintaining the optimum output through each stream, periodic cleaning and flushing is required, for which each stream needs to be stopped for 48 hours. However, the Petitioner has stated, that even the cleaning process does not improve the permeate flow to the design level. Moreover, during break down of HP Pumps, Booster Pumps, Pressure Exchangers etc. needs shutdown of stream, which affects the total plant outlet, also for routine preventive maintenance, stream shutdown is required. The Petitioner has further submitted that the average water consumption per day varies up to 10,000 – 12,000 M³/day during plant operation depending on requirement. At the time of overhauling extra water requirement is there for air pre-heater washing, Boiler Internal/External washings, safety valve checking etc. It is further submitted that non-availability of any one stream from existing three streams hampers the normal operation of plant, since there is no standby fourth stream. Even during emergency situations, it is very difficult to take out any stream out without reducing load. The Petitioner has also stated that in order to have regular

preventive and other break down maintenance, 4th SWRO which will act as a standby is proposed to be installed.

(c) Remineralization system

41. The Petitioner has submitted that in the generating station, RO permeate water is being used for service water, HVAC, fire water etc., but this RO permeate water is highly corrosive in nature, when directly used, which results in leakages in service water lines, fire water lines and HVAC system. It has stated that the corrosiveness nature of permeate water is not addressed in design and only caustic dosing was given which does not increase the LSI to positive side and still it was in negative. (-ve Lange liar Saturation Index means water is corrosive to steel). The Petitioner has further submitted that in order to address the issue of corrosiveness of permeate water, presently a short-term plan of adding two different chemicals have been identified, however a long term and permanent solution of remineralization with lime bed is envisaged which is universally used method of remineralization due to difficulty in handling hygroscopic chemicals and also as a cost effective one. It has stated that the Lime bed vessels (LBV) in the permeate transfer line, with CO_2 dosing will increase the LSI of permeate water and corrosion issues will be eliminated. In view of the above, the Petitioner has prayed to allow the additional capital expenditure on the above said works beyond the original scope of work.

42. The Respondents TANGEDCO has submitted that the Petitioner has not furnished the detailed justification for increasing the life of the de-salination plant. The Respondent KSEBL has submitted that the additional capital expenditure beyond the cut-off date may be disallowed.

43. The matter has been considered. It is observed that the generating station is using the sea water for its water requirement and the Petitioner has already arrangements for reducing the silt content in order to use the water from the sea directly. Also, the Petitioner in Form 5B, as submitted in Petition No. 576/GT/2020, has made certain expenditure on DM water plant including clarification plant with RO system, as on the COD of the generating station. From the submissions of the Petitioner, it is evident that the expenditure claimed by the Petitioner on account of Desalination, Remineralization and Ultrafiltration package, is in addition to the current arrangement and without decapitalization of the old assets. The Petitioner has now claimed additional facility to re mineralize the sea water. However, the Petitioner has not furnished any justification indicating that the existing system has not been able to achieve the desired parameters of water. Since the generating station is using the sea water for its operation and as evident from the reports submitted by the Petitioner, that the silt level is increasing due to high vessel traffic, **we grant liberty to the Petitioner to furnish the details of the actual additional capital expenditure on account of Desalination, Remineralization and Ultrafiltration package along with the de-capitalization value of the old arrangement at the time of truing up of tariff.** The Petitioner shall also furnish the details of works carried out from the additional O&M expenditure allowed towards desalination plant along with details of the additional capital expenditure claimed, at the time of truing up of tariff. In view of the above discussion, the projected additional capital expenditure claimed by the Petitioner is not allowed**,** at this stage.

Works for enhancing security

44. The Petitioner has claimed total projected additional capital expenditure of Rs.437.00 lakh (Rs. 200.00 lakh in 2020-21 and Rs. 237.00 lakh in 2021-22) towards

works for enhancing security, under Regulation 26(1)(d) of the 2019 Tariff Regulations. In justification of the claim, the Petitioner has submitted that in view of the prevailing security situation in the region, MOP, GoI, vide letter dated 23.10.2019, has directed the Petitioner for strengthening of the security of vital installations and critical infrastructure. The Petitioner has further submitted that the salient features of Integrated Security System proposed for the generating stations are as follows:

a. CCTV cameras at perimeter, watch towers and other static locations;
b. PIDS (Perimeter Intrusion Detection System) for perimeter intrusion alerts;
c. Access Control system with pre-built zones, entry & exit through smart cards, biometric access for critical areas;
d. Physical security equipment like turnstiles, boom barrier, bollards, RFID tag-based Vehicle entry;
e. Automatic number plate recognition system (ANPR) and Under Vehicle scanning system (UVSS) for scanning the vehicles for any explosives;
f. Security Operation Centre (SOC) with command & control centre with 2D location maps;
g. GPS enabling of QRT vehicles & fire vehicles;
h. Thermal cameras for long distance night-time monitoring; and
i. Material movement of high value items through RFID tags.

45. The Petitioner has submitted that as per specifications approved by CISF authorities, the expenditure for implementation of “Integrated Security System" for enhanced security of the generating station is incurred and therefore the same may be allowed under Regulation 26(1)(d) of the 2019 Tariff Regulations. The Petitioner has also submitted that the ‘integrated security system’ proposed by the security agency i.e. CISF, is to be installed by the Petitioner only to take care of such exigencies.

46. The matter has been considered. In our view, since the projected additional capital expenditure claimed is necessary for higher security and safety of the generating station. Further, the Integrated Security System proposed for the generating station is also recommended by CISF, the claim of the Petitioner is **allowed**, under Regulation

26(1)(d) of the 2019 Tariff Regulations. However, the Petitioner is directed to provide breakup of the actual expenditure incurred towards the said additional capital expenditure at the time of truing up of tariff.

47. Based on above, the summary of projected additional capital expenditure allowed for the period 2019-24, is as under:

(Rs. in lakh)

Sl. No.		**Regulation**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
A.	**Works within original scope, change-in-law etc. eligible for ROE at Normal Rate**						
1	Ash Dyke lagoon-1/ Ash Handling related works	25(1)(c) read with 25(1)(g)	0.00	0.00	0.00	0.00	2443.44
2	Ash Dyke lagoon-2, 1st Raising	25(1)(c) read with 25(1)(g)	0.00	0.00	0.00	0.00	
3	HFO/LDO conversion	26(1)(b)	0.00	52.00	0.00	0.00	0.00
4	Online Coal Analyzer	26(1)(b)	0.00	67.00	0.00	0.00	0.00
5	Dust Suppression system for Ash Dyke- Lagoon	26(1)(b)	0.00	0.00	323.00	0.00	276.00
6	Segregation of plant drains	26(1)(b)	0.00	0.00	0.00	0.00	0.00
7	Dust extraction system of Crusher house & Coal Yard sprinkling system in CHP	25(1)(d)	0.00	0.00	0.00	0.00	0.00
8	Bio-degradable waste management / Hazardous Waste Management Facility	26(1)(b)	3.00	276.00	0.00	0.00	0.00
9	Scrap Yard for steel waste	26(1)(b)	0.00	117.00	0.00	0.00	0.00
10	Electro chlorination system in CWPH	26(1)(b) and 26(1)(d)	0.00	0.00	0.00	0.00	0.00
	Sub-Total (A)		**3.00**	**512.00**	**323.00**	**0.00**	**2719.44**
B.	**Works beyond Original scope excluding add-cap due to Change in Law eligible for RoE at Weighted Average rate of Interest**						
1	Desalination, Remineralization Ultrafiltration package	26(1)(c)	0.00	0.00	0.00	0.00	0.00
2	Works for enhancing security	26(1)(d)	0.00	200.00	237.00	0.00	0.00
	Sub-Total (B)		**0.00**	**200.00**	**237.00**	**0.00**	**0.00**
	Total Additional capital expenditure allowed (on projection basis) (A+B)		**3.00**	**712.00**	**560.00**	**0.00**	**2719.44**

Discharges and Un-discharged liabilities

48. The closing balance of undischarged liabilities, as on 31.3.2019, considered vide order dated 20.3.2023 in Petition No. 576/GT/2020, is Rs.25577.70 lakh. However, the Petitioner in the present petition has not claimed any discharge of liabilities during the

period 2019-24. Accordingly, discharge of liabilities during the period 2019-24, has been considered as 'Nil'.

Capital Cost allowed for the period 2019-24

49. As stated earlier, the closing capital cost of Rs.934487.39 lakh as on 31.3.2019, as approved vide order dated 20.3.2023 in Petition No. 576/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 period 2019-24, is as under:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Opening Capital Cost	934487.39	934490.39	935202.39	935762.39	935762.39
Add: Additional capital expenditure	3.00	712.00	560.00	0.00	2719.44
Closing Capital Cost	**934490.39**	**935202.39**	**935762.39**	**935762.39**	**938481.83**
Average Capital Cost	934488.89	934846.39	935482.39	935762.39	937122.11

Debt Equity Ratio

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

> *"18. Debt-Equity Ratio: (1) For a 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 generating station or a transmission system including communication system which has completed its useful life as on or after 1.4.2019, if the equity actually deployed as on 1.4.2019 is more than 30% of the capital cost, equity in excess of 30% shall not be taken into account for tariff computation;

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

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

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

51. The Petitioner has claimed gross normative loan of Rs.657001.58 lakh and equity of Rs.281572.10 lakh as on 1.4.2019 and has considered debt-equity ratio of 70:30 for funding of projected additional capital expenditure claimed during the period 2019-24. The gross normative loan and equity of the generating station as on 31.3.2019 approved by the Commission in its order dated 20.3.2023 in Petition No. 576/GT/2020 is Rs. 654141.17 lakh (i.e. 70.00% of the admitted capital cost as on 31.3.2019) and Rs.280346.22 lakh (i.e. 30.00% of the admitted capital cost as on 31.3.2019), respectively which has been retained as on 1.4.2019. Further, the projected additional capital expenditure approved above has been allocated to debt and equity in debt-equity ratio of 70:30. Accordingly, the debt-equity ratio is worked out as under:

(*Rs. *in lakh)

	Capital cost as on 1.4.2019	**(%)**	**Additional capital expenditure**	**(%)**	**Total cost as on 31.3.2024**	**(%)**
Debt	654141.17	70.00	2796.11	70.00	656937.28	70.00
Equity	280346.22	30.00	1198.33	30.00	281544.55	30.00
Total	**934487.39**	**100.00**	**3994.44**	**100.00**	**938481.83**	**100.00**

Return on Equity

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

"30. Return on Equity:

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

(2) Return on equity shall be computed at the base rate of 15.50% for thermal generating stations transmission system including communication system and run of river hydro generating station and at the base rate of 16.50% for the storage type hydro generating stations including pumped storage hydro generating stations and run of river generating station with pondage:

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

Provided further that:

(i) In case of a new project the rate of return on equity shall be reduced by 1.00% for such period as may be decided by the Commission if the generating station or transmission system is found to be declared under commercial operation without commissioning of any of the Restricted Governor Mode Operation (RGMO) or Free Governor Mode Operation (FGMO) data telemetry communication system up to load dispatch centre or protection system based on the report submitted by the respective RLDC;

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

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

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

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

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

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

"31. Tax on Return on Equity:

(1) The base rate of return on equity as allowed by the Commission under Regulation 30 of these regulations shall be grossed up with the effective tax rate of the respective financial year. For this purpose the effective tax rate shall be considered on the basis of actual tax paid in respect of the financial year in line with the provisions of the relevant Finance Acts by the concerned generating company or the transmission licensee as the case may be. The actual tax paid on income from other businesses including deferred tax liability (i.e. income from business other than business of generation or transmission as the case may be) shall be excluded for the calculation of effective tax rate.

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

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

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

Illustration-

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

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

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

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

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

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

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

(3) The generating company or the transmission licensee as the case may be shall true up the grossed up rate of return on equity at the end of every financial year based on actual tax paid together with any additional tax demand including interest thereon duly adjusted for any refund of tax including interest received from the income tax authorities pertaining to the tariff period 2019-24 on actual gross income of any financial year. However penalty if any arising on account of delay in deposit or short deposit of tax amount shall not be claimed by the generating company or the transmission licensee as the case may be. Any under-recovery or over-recovery of grossed up rate on return on equity after truing up shall be recovered or refunded to beneficiaries or the long term transmission customers as the case may be on year to year basis."

54. 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 (WAROI) on actual loan portfolio of the generating station.

55. 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 WAROI, as considered for computation of interest on loan. For equity base, ROE has been calculated by grossing up of ROE during the period 2019-24. The Petitioner has claimed tariff considering the rate of ROE as 18.782% i.e., base rate of 15.50% and MAT Rate of 17.472% (i.e., MAT Rate of 15% + Surcharge of 12% + HEC of 4%) for the period 2019-24. 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, ROE has been worked out at the WAROI, grossed up with the effective tax rate of the respective financial year. Accordingly, ROE has been worked out 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)	280346.22	280347.12	280500.72	280597.62	280597.62
Addition of Equity due to additional capital expenditure (B)	0.90	153.60	96.90	0.00	815.83
Normative Equity-Closing (C) = (A) + (B)	280347.12	280500.72	280597.62	280597.62	281413.45
Average Normative Equity (D) = [(A+C)/2]	280346.67	280423.92	280549.17	280597.62	281005.53
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) Annualized (H) = [(D)x(G)]	**52654.71**	**52669.22**	**52692.74**	**52701.84**	**52778.46**

(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	0.00	60.00	131.10	131.10
Addition of Equity due to additional capital expenditure (B)	0.00	60.00	71.10	0.00	0.00
Normative Equity-Closing (C) = (A) + (B)	**0.00**	**60.00**	**131.10**	**131.10**	**131.10**
Average Normative Equity (D) = [(A+C)/2]	0.00	30.00	95.55	131.10	131.10
Weighted average rate of interest on actual loan portfolio (E)	9.975%	9.997%	10.018%	10.038%	10.057%

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)]	12.086%	12.113%	12.138%	12.163%	12.186%
Return on Equity (Pre-Tax) - annualized (H) = (D) x (G)	**0.00**	**3.63**	**11.60**	**15.95**	**15.98**
Total Return on Equity	**52654.71**	**52672.85**	**52704.34**	**52717.79**	**52794.44**

Interest on loan

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

> *"32. Interest on loan capital: (1) The loans arrived at in the manner indicated in Regulation 18 of these regulations shall be considered as gross normative loan for calculation of interest on loan.*
>
> *(2) The normative loan outstanding as on 1.4.2019 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2019 from the gross normative loan.*
>
> *(3) The repayment for each of the year of the tariff period 2019-24 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalization of such asset.*
>
> *(4) Notwithstanding any moratorium period availed by the generating company or the transmission licensee, as the case may be, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the depreciation allowed for the year or part of the year.*
>
> *(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio after providing appropriate accounting adjustment for interest capitalized:*
>
> *Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered:*
>
> *Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.*
>
> *(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.*
>
> *(7) The changes to the terms and conditions of the loan shall be reflected from the date of such re-financing."*

57. Interest on loan has been computed as under:

i) Gross normative loan amounting to Rs.654141.17 lakh has been considered as on 1.4.2019;

ii) Cumulative repayment of Rs. 235607.40 lakh as on 31.3.2019, as considered in order dated 20.3.2023 in Petition No. 576/GT/2020 has been considered as on 1.4.2019;

iii) Accordingly, the net normative opening loan as on 1.4.2019, is Rs. 418533.78 lakh;

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

v) Depreciation allowed has been considered as repayment of normative loan during the respective year of the period 2019-24;

58. The Petitioner has claimed interest on loan by applying WAROI of 9.9747%, 9.9966%, 10.0176%, 10.0376% and 10.0567% for 2019-20, 2020-21, 2021-22, 2022-23 and 2023-24, respectively and the same has been considered. 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. Accordingly, Interest on loan has been worked out as under:

(Rs. in lakh)

		2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
A	Gross opening loan	654141.17	654143.27	654641.67	655033.67	655033.67
B	Cumulative repayment of loan upto previous year	235607.40	282410.34	329231.18	376083.88	422950.61
C	Net Loan Opening	418533.78	371732.94	325410.49	278949.79	232083.06
D	Addition on account of additional capital expenditure	2.10	498.40	392.00	0.00	1903.61
E	Repayment of loan during the year	46802.94	46820.85	46852.70	46866.72	46934.82
F	**Net Loan Closing**	**371732.94**	**325410.49**	**278949.79**	**232083.06**	**187051.85**
G	Average Loan	395133.36	348571.71	302180.14	255516.43	209567.46
H	Weighted Average Rate of Interest on Loan	9.9747%	9.9966%	10.0176%	10.0376%	10.0567%
I	**Interest on Loan**	**39413.48**	**34845.36**	**30271.09**	**25647.70**	**21075.61**

Depreciation

59. 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.

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

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

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

Provided further that in case of hydro generating stations, the salvage value shall be as provided in the agreement, if any, signed by the developers with the State Government for development of the generating station:
Provided also that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciated value shall correspond to the percentage of sale of electricity under long-term power purchase agreement at regulated tariff:

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

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

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

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

(6) In case of the existing projects, the balance depreciable value as on 1.4.2019 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2019 from the gross depreciable value of the assets.

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

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

60. The cumulative depreciation amounting to Rs.235607.40 lakh as on 31.3.2019 as

considered in order dated 20.3.2023 in Petition No. 576/GT/2020, has been considered as on 1.4.2019. Also, the value of freehold land amounting to Rs.10916.86 lakh has been considered. The Petitioner has submitted that the value of IT Equipment shall be provided at the time of truing up. Accordingly, the same shall be considered at the time of truing up of tariff. The balance depreciable value (before providing depreciation) for 2019-20 works out to Rs. 595607.43 lakh. Since, as on 1.4.2019, the elapsed life of the generating station is 5.35 years, which is less than 12 years from the effective station COD of 25.2.2015, depreciation has been calculated by applying weighted average rate of depreciation (WAROD) for the period 2019-24, as claimed by the Petitioner, subject to truing-up. Accordingly, depreciation allowed for the generating station is as under:

(Rs. in lakh)

		2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
A	Average Capital Cost	934488.89	934846.39	935482.39	935762.39	937122.11
B	Value of freehold land included above	10916.86	10916.86	10916.86	10916.86	10916.86
C	Depreciable value [(A-B) x 0.9]	831214.82	831536.57	832108.97	832360.97	833584.72
D	Remaining aggregate depreciable value at the beginning of the year (C – Cumulative depreciation at the end of the preceding period)	595607.43	549126.24	502877.79	456277.09	410634.12
E	No. of completed years at the beginning of the year	5.35	6.35	7.35	8.35	9.35
F	Balance useful life at the beginning of the year (25 – E)	19.65	18.65	17.65	16.65	15.65
G	WAROD	5.008%	5.008%	5.008%	5.008%	5.008%
H	**Depreciation during the year (A x G)**	**46802.94**	**46820.85**	**46852.70**	**46866.72**	**46934.82**
I	**1. Cumulative depreciation at the end of the year**	282410.34	329231.18	376083.88	422950.61	469885.43

Operation & Maintenance Expenses

61. 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;

62. The Petitioner has claimed normative O&M expenses as under:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Normative O&M expenses claimed under Regulation 35(1)(1) of the 2019 Tariff Regulations **(a)**	33765.00	34950.00	36180.00	37455.00	38760.00
O&M expenses under Regulation 35(1)(6) of the 2019 Tariff Regulations:					
- Water Charges	-	-	-	-	-
- Security Expenses	2834.00	2964.00	3094.00	3225.00	3357.00
-Additional O&M for Desalination plant	1106.00	1144.45	1184.62	1226.19	1269.22
- Capital Spares consumed	-	-	-	-	-
-O&M Expense – Ash Transportation	-	-	-	-	-
Total O&M Expenses	**37705.00**	**39058.45**	**40458.62**	**41906.19**	**43386.22**

63. The normative O&M expenses claimed in terms of the Regulation 35(1)(1) of the 2019 Tariff Regulations is found to be in order and is allowed for the period 2019-24.

Water Charges

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

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

Provided that water charges shall be allowed based on water consumption depending upon type of plant and type of cooling water system, subject to prudence check [and considering the norms of specific water consumption notified by the Ministry of

Environment, Forest and Climate Change]. The details regarding the same shall be furnished along with the petition:

65. In terms of the above regulation, water charges are to be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check of the details furnished by the Petitioner. The Petitioner has submitted that at present the generating station is using sea water and is not paying any water charges. Since, the Petitioner has not claimed any water charges during the period 2019-24, the same has not been considered in this order.

Security Expenses

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

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

Xxxx

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

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

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
2834.00	2964.00	3094.00	3225.00	3357.00

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

69. We have examined the matter. It is noticed that the Petitioner has claimed projected security expenses for the period 2019-24. However, the assessment of security requirement as required under the provisions of the 2019 Tariff Regulations, has not been furnished by the Petitioner. Accordingly, the Petitioner is directed to

furnish the requisite details for carrying out the prudence check of security expenses at the time of truing up along with complete breakup and details. At present, the projected security expenses for the period 2019-24, has been considered for the purpose of tariff. Accordingly, the security expenses, as claimed by the Petitioner above is allowed, subject to truing up of tariff.

Capital Spares

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

Additional O&M Expense for Desalination Plant

71. The Petitioner has claimed additional O&M expenses of Rs. 1106.00 lakh in 2019-20, Rs. 1144.45 lakh in 2020-21, Rs. 1184.62 lakh in 2021-22, Rs. 1226.19 lakh in 2022-23 and Rs. 1269.22 lakh in 2023-24 on projected basis, towards chemicals, filters and membranes used in the desalination plant. These expenses have been claimed at an escalation rate of 3.51% based on actual O&M expense for 2018-19 of Rs. 1068.16 lakh in line with the 2019 Tariff Regulations.

72. It is observed that this special feature of the coastal generating station is required for smooth and efficient operation of the generating station. The Commission vide its order dated 20.3.2023 in Petition No. 576/GT/2020 had allowed these expenses, stating that the same is required for smooth and efficient operations of the generating station.

Accordingly, as of now, considering the need of this feature, the O&M expenses for desalination plant as claimed by the Petitioner is **allowed** in exercise of the power under Regulation 76 of the 2019 Tariff Regulations. However, the Petitioner, shall, at the time of truing up, furnish the complete breakup clearly indicating each and every activity and each and every part of the additional O&M expenditure incurred for the desalination plant.

73. In view of the above, the total O&M expenses including water charges and security expenses, allowed to the generating station for the period 2019-24, is summarized below:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Normative O&M expenses claimed under Regulation 35(1)(1) of the 2019 Tariff Regulations **(a)**	33765.00	34950.00	36180.00	37455.00	38760.00
Normative O&M expenses allowed under Regulation 35(1)(1) of the 2019 Tariff Regulations (b)	33765.00	34950.00	36180.00	37455.00	38760.00
Water Charges claimed under Regulation 35(1)(6) of the 2019 Tariff Regulations **(c)**	0.00	0.00	0.00	0.00	0.00
Water Charges allowed under Regulation 35(1)(6) of the 2019 Tariff Regulations (d)	0.00	0.00	0.00	0.00	0.00
Security Expenses claimed under Regulation 35(1)(6) of the 2019 Tariff Regulations **(e)**	2834.00	2964.00	3094.00	3225.00	3357.00
Security Expenses allowed under Regulation 35(1)(6) of the 2019 Tariff Regulations (f)	2834.00	2964.00	3094.00	3225.00	3357.00
Additional O&M Expenses claimed towards Desalination Plant (g)	1106.00	1144.45	1184.62	1226.19	1269.22
Additional O&M Expense allowed towards Desalination Plant (h)	1106.00	1144.45	1184.62	1226.19	1269.22
Total O&M expenses claimed under Regulation 35 of the 2019 Tariff Regulations (a + c + e + g)	**37705.00**	**39058.45**	**40458.62**	**41906.19**	**43386.22**
Total O&M expenses allowed under Regulation 35 of the 2019 Tariff Regulations (b + d + f + h)	**37705.00**	**39058.45**	**40458.62**	**41906.19**	**43386.22**

Additional expenditure for Emission Control System

74. The Petitioner has submitted that it is in the process of installing the Emission Control Systems (ECS) in compliance to the revised emission standards as notified by the MOEFCC vide notification dated 7.12.2015, as amended. The Petitioner has further submitted that the completion of these schemes in compliance to the revised emission norms will affect the Auxiliary Power Consumption (APC), Heat Rate, and O&M expenses etc. In addition, the Petitioner has also stated that the availability of the unit/station would also be affected due to shutdown of the units for installation of ECS. The Petitioner has further submitted that it would be filing the details of the same in a separate petition in terms of Regulation 29 of the 2019 Tariff Regulations.

75. Since, the Petitioner has not claimed any additional expenditure with regard to ECS in terms of the MOEFCC notification dated 7.12.2015, and has submitted that it would file a separate petition, the same is not considered in this order. The issues with respect to Auxiliary Power Consumption (APC), Heat Rate, and O&M expenses etc. would be dealt as per the claim of the Petitioner in separate petition. Accordingly, the Petitioner is at liberty to claim the additional expenditure on this count by way of a separate petition in terms of the Regulation 29 of the 2019 Tariff Regulations and the same will be considered in accordance with law.

Additional expenditure towards Fly ash transportation

76. The Petitioner has submitted that MOEF&CC vide notification dated 25.1.2016 in terms of the provisions of Environment (Protection) Act, 1986, has prescribed the transportation cost of fly ash generated at power stations. In this regard, the Petitioner had filed Petition No.172/MP/2016 before this Commission, seeking reimbursement of the additional expenditure incurred for Fly Ash Transportation directly from the

beneficiaries as the same was in the nature of statutory expenses. It has further submitted that the expenditure incurred towards fly ash transportation are recurring in nature and that the Petitioner has been incurring the same in some of its generating stations during the period 2019-24 also. The Petitioner has submitted that in case these charges are permitted to be recovered at the end of the period 2019-24, there will be additional liability on the beneficiaries on account of interest payment for the period till the time the petitions for truing-up of tariff for the period 2019-24 is decided. Accordingly, the Petitioner has submitted that to avoid the interest payment liability of the beneficiaries, it may be allowed to recover/ pass on the fly ash transportation charges, after adjusting the revenue earned from the sale of fly ash at the end of each quarter of the financial year, subject to truing-up at the end of the period 2019-24. It has submitted that billing & recovery of Ash transportation charges provisionally, on a monthly basis, may be allowed, based on self-certification and the recovery shall be subject to truing up at the end of financial year, based on auditor's certificate. The Petitioner has added that the issue of monthly recovery and the procedure for recovery of costs is no more res-integra, since this Commission in its order dated 22.3.2021, in Petition No. 405/MP/2019 (GKEL & Anr. v. DHBVNL & Ors) had devised a mechanism for the generator therein, to recover future expenditure incurred on transportation of fly ash, wherein the Commission has directed recovery of expenditure on transportation of fly ash on a monthly basis, with reconciliation on an annual basis. The Petitioner herein has prayed that a similar procedure may also be made applicable in the case of the Petitioner.

77. The Respondent KSEBL has submitted that the Commission vide its order dated 5.11.2018 in Petition No.172/MP/2016 had granted liberty to the Petitioner to approach

the Commission at the time of revision of tariff, based on all details/ information, duly certified by the auditor. It has submitted that since the matter is already decided, the request of the Petitioner to recover the additional expenditure for fly ash transportation at the end of each quarter of the financial year may be rejected. The Respondent, TANGEDCO has submitted that for considering the fly ash transportation expenses, the Petitioner has to submit the details of bidding process, actual additional expenditure incurred on fly ash transportation after 25.1.2016, revenue generated etc. Accordingly, the Respondent has stated that the claim of the Petitioner for fly ash transportation charges may be rejected.

78. We have examined the matter. The Commission vide its order dated 5.11.2018 in Petition No.172/MP/2016 had decided that the MOEF&CC notification dated 25.1.2016 amending the earlier notification dated 14.9.1999 issued under Environment (Protection) Rules, 1986 as 'change in law' and had disposed of the said petition vide order dated 5.11.2018 as under:

> *"31. Accordingly, we in exercise of the regulatory power hold that the actual additional expenditure incurred by the Petitioner towards transportation of ash in terms of the MOEFCC Notification is admissible under "Change in Law" as additional O&M expenses. However, the admissibility of the claims is subject to prudence check of the following conditions on case to case basis for each station:*
> *a) Award of fly ash transportation contract through a transparent competitive bidding procedure. Alternatively, the schedule rates of the respective State Governments, as applicable for transportation of fly ash.*
> *b) Details of the actual additional expenditure incurred on Ash transportation after 25.1.2016, duly certified by auditors.*
> *c) Details of the Revenue generated from sale of fly ash/ fly ash products and the expenditure incurred towards Ash utilisation up to 25.1.2016 and from 25.1.2016 to till date, separately.*
> *d) Revenue generated from fly Ash sales maintained in a separate account as per the MoEF notification."*
>
> *32. The Petitioner is granted liberty to approach the Commission at the time of revision of tariff of the generating stations based on truing –up exercise for the period 2014-19 in terms of Regulation 8 of the 2014 Tariff Regulations along with all details / information, duly certified by auditor."*

79. The Petitioner NTECL is a joint venture of NTPC and Tamil Nadu and has claimed the recovery of the fly ash transportation charges, after adjusting the revenue earned from the sale of fly ash at the end of each quarter of the financial year. However, the Petitioner has not submitted any details of the said claim. In view of this, the claim of the Petitioner has not been considered in this order. The Petitioner is granted liberty to claim the expenditure on tis count, by way of a separate petition or at the time of true up giving details of the ash transportation expenses, and the same will be considered in accordance with law.

Operational Norms

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

Normative Annual Plant Availability Factor (NAPAF) (%)	85
Heat Rate (kCal/kwh)	2386.59
Auxiliary Power Consumption (%)	7.19
Specific Oil Consumption (ml/kwh)	0.50

Normative Annual Plant Availability Factor

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

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

82. As the NAPAF claimed by the Petitioner is in terms of Regulation 49(A)(a) of the 2019 Tariff Regulations, the same is allowed.

Gross Station Heat Rate (kCal/kWh)

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

> *"(b) Thermal Generating Stations achieving COD on or after 1.4.2009:*
> *"(i) For Coal-based and lignite-fired Thermal Generating Stations:*
> *1.05 X Design Heat Rate (kCal/kWh)*

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

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

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

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

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

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

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

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

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

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

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

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

84. The Petitioner has furnished the design turbine cycle heat rate and boiler efficiency of the generating station as 1932 kcal/kWh and 85% respectively. Accordingly, the Unit design heat rate worked out is 2272.94 kCal/kWh (1932/0.85). In terms of the Regulation 49(C)(b)(i) of the 2019 Tariff Regulations, new thermal generating stations achieving COD on or after 1.4.2009, the Gross Station Heat Rate= 1.05 x Design Heat Rate (kCal/kWh) i.e. 1.05 X 2272.94 = 2386.588 kCal/kWh. This Regulation also provides that where the boiler efficiency is lower than 86% for Sub-bituminous Indian coal, the same shall be considered as 86% for Sub-bituminous Indian coal, for computation of station heat rate. Therefore, the Turbine Cycle Heat rate and boiler efficiency has been considered as 1932 and 86% respectively, for computation of design heat rate. Accordingly, the design heat rate of the generating station works out as 2246.51 kCal/kWh (i.e. 1932/0.86).

85. The regulation also provides that the design heat rate shall not exceed the maximum design unit heat rates depending upon the pressure and temperature ratings of the units as specified by the Commission, where ceiling design heat rate for plants having temperature of 537/565 ºC and pressure rating of 170 Kg/cm² using sub-bituminous coal is given as 2250 kCal/kWh. The Design heat rate of the generating station now considered as per Regulation is 2246.51 kCal/kWh, which is lower than the ceiling design heat rate of 2250 kcal/kwh. In view of this, the design heat rate of

2246.51 kCal/kWh has been considered as the Design heat rate for this generating station. Considering the multiplication factor of 1.05, the applicable Station Heat Rate is 2358.837 kCal/kWh (1.05 x 2246.51). This GSHR of 2358.837 kCal/kWh has been considered for the purpose of determination of tariff for the period 2019-24.

Secondary Fuel Oil Consumption

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

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

87. 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 in terms of the said regulations, the same is allowed.

Auxiliary Power Consumption

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

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

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

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

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

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

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

89. The Petitioner has claimed Auxiliary Power Consumption (APC) of 7.19% and has submitted that as the generating station is located in the coastal region, due to additional equipment/system such as cross-country pipe conveyor, grab unloader at jetty (for unloading coal from ship) and electrical equipment for desalination of sea water through RO system were the integral part of the system and accordingly requires additional APC of 0.94%. The Petitioner has referred to the Commission's Order dated 11.7.2017 in Petition No. 277/GT/2014 wherein the Commission has considered the APC of 6.69% and has observed as under:

".....It is observed that the station has special features for which there will be additional auxiliary consumption for running the additional systems like coal transportation from port to project and also additional electrical equipment installed for desalination of sea water through RO system. In this background, we are inclined to relax the operational norm for APC and allow the APC of 6.69% as claimed by the petitioner....."

90. The Respondent TANGEDCO and KSEBL has submitted that the Commission has already relaxed the auxiliary consumption to accommodate the increase in APC due to added features like desalination plant, coal conveying system and considered very relaxed norms of 6.69%. The Respondents have also submitted that the Petitioner has not furnished the details of APC and PLF since COD of the generating station. The Respondents have also submitted that the claim of the Petitioner may be rejected in the absence of details, as mentioned above.

91. The Petitioner, has submitted the details of APC and PLF for the period from 2014 till 2021 as under:

	PLF (In %)	On bar Plant Availability Factor (In %)	Loading Factor	Actual APC (In %)	Normative APC (In %)	Compensation applicable as per IEGC 4th amendment	Compensated APC (In %)	APC Under Recovery
2014-15	62.70	76.31	82.16	7.17	6.69	0.35	7.04	(-)0.13
2015-16	58.53	75.93	77.08	7.55	6.69	0.35	7.04	(-)0.51
2016-17	70.10	84.11	83.34	7.02	6.69	0.35	7.04	0.02
2017-18	54.55	70.46	77.42	7.85	6.69	0.35	7.04	(-)0.81
2018-19	58.65	75.40	77.79	7.73	6.69	0.35	7.04	(-)0.69
Average (2014-19) period				**7.46**	**6.69**	**0.35**	**7.04**	**(-)0.54**
2019-20	43.07	72.34	59.53	9.05	6.25	1	7.25	(-)1.80
2020-21	33.25	50.45	65.90	9.54	6.25	0.65	6.90	(-)2.64

92. It is observed that the additional electrical powers are required for the operation of cross country pipe conveyor system, Grab un-loader at Jetty installed for unloading of coal from the ship and desalination plant as there is no water source near the power plant and the project is designed to use sea water, which will be converted as portable water for drinking, service water for different purposes and DM water for process make-up & equipment cooling make up through RO conversion. The auxiliary consumption due to special features like desalination of sea water, coal conveying system from port to station etc. have not been considered in the operational norms under the 2019 Tariff Regulations. It is observed that the generating station has special features, for which there will be additional auxiliary consumption for running the additional systems like coal transportation from port to project, and also additional electrical equipment installed for desalination of sea water through RO system.

93. While allowing the Auxiliary Power Consumption of 6.69%, vide order dated 11.7.2017 in Petition No. 277/GT/2014, the Commission has gone through the details of actual Auxiliary Power Consumption due to additional features. The Petitioner, vide

affidavit dated 6.10.2015 in Petition No. 277/GT/2014 had submitted that 5.99 MW is required for cross country pipe conveyor, 4.44 MW for Grab unloader at Jetty (for unloading coal from the ship) and 5.26 MW electrical equipment (for desalination of sea water through RO system). Accordingly, the total additional load of 15.69 MW was considered for calculating the APC for the generating station i.e. additional 1.04% of the APC. The normative Auxiliary power consumption allowable as per 2014 Tariff Regulations was 5.75%. However, the Petitioner was allowed 6.69% as claimed, including additional features for desalination plant. This was subject to submission of details of actual Auxiliary Power Consumption, PLF of the station since COD of Unit-III to 31.3.2019 at the time of truing up of the tariff.

94. The additional APC of 1.04% includes 5.99 MW for cross country pipe conveyor, 4.44 MW for Grab unloader at Jetty (for unloading coal from the ship) and 5.26 MW electrical equipment (for desalination of sea water through RO system). was allowed to the generating station for the period 2014-19. However, the Petitioner has now claimed 0.94% due to additional features. The Petitioner has not submitted the breakup of now claimed additional Auxiliary power consumption of 0.94%. Further, it is noticed that the additional APC of 0.94% claimed is less than the additional APC of 1.04% as allowed by the Commission for the period 2014-19. However, the generating station was new at the time of submission of the actual power consumption details by the Petitioner, during 2015, and due to number of start-stop of the units during synchronization, the plant consumes more APC. Moreover, the auxiliary power consumption also depends on loading factor, number of start-stop and also due to shutdown period. Now that the generating station is smoother and stable, the Petitioner is directed to furnish the detail of actual Auxiliary Power Consumption, PLF and NAPAF of the generating station since

COD of Unit-III to 31.3.2019 at the time of truing up of tariff. In this background, we allow the APC of 6.69% as allowed vide orders dated 11.7.2017 in Petition No. 277/GT/2014 and order dated 20.3.2023 in Petition No.576/GT/ 2020.

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

Normative Annual Plant Availability Factor (NAPAF) (%)	85
Heat Rate (kCal/kwh)	2358.837
Auxiliary Power Consumption (%)	6.69
Specific Oil Consumption (ml/kwh)	0.50

Interest on Working Capital

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

> *"34. **Interest on Working Capital**: (1) The working capital shall cover:*
>
> *(a) **For Coal-based/lignite-fired thermal generating stations**:*
>
> *(i) Cost of coal or lignite and limestone towards stock if applicable for 10 days for pit-head generating stations and 20 days for non-pit-head generating stations for generation corresponding to the normative annual plant availability factor or the maximum coal/lignite stock storage capacity whichever is lower;*
>
> *(ii) Advance payment for 30 days towards cost of coal or lignite and limestone for generation corresponding to the normative annual plant availability factor;*
>
> *(iii) Cost of secondary fuel oil for two months for generation corresponding to the normative annual plant availability factor and in case of use of more than one secondary fuel oil cost of fuel oil stock for the main secondary fuel oil;*
>
> *(iv) Maintenance spares @ 20% of operation and maintenance expenses including water charges and security expenses;*
>
> *(v) Receivables equivalent to 45 days of capacity charge and energy charge for sale of electricity calculated on the normative annual plant availability factor; and*
>
> *(vi) Operation and maintenance expenses including water charges and security expenses for one month.*
>
> *(b) **For Open-cycle Gas Turbine/Combined Cycle thermal generating stations**:*
>
> *(i) Fuel cost for 30 days corresponding to the normative annual plant availability factor duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;*
>
> *(ii) Liquid fuel stock for 15 days corresponding to the normative annual plant availability factor and in case of use of more than one liquid fuel cost of main liquid fuel duly taking into account mode of operation of the generating stations of gas fuel and liquid fuel;*

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

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

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

(c) ***For Hydro generating station (including Pumped Storage Hydro Generating Station) and transmission system****:*
(i) Receivables equivalent to 45 days of annual fixed cost;

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

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

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

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

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

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

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

Fuel Cost and Energy Charges in Working Capital

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

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

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

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

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

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

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

Where,

AUX = Normative auxiliary energy consumption in percentage.

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

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

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

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

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

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

LC = Normative limestone consumption in kg per kWh;

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

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

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

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

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

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

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

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

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

100. Accordingly, the Petitioner has claimed ECR of Rs.3.608 per kWh and following fuel cost component in working capital :

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Cost of coal for 50 days	50928.33	50928.33	50928.33	50928.33	50928.33
Cost of secondary fuel oil for 2 months	367.19	366.19	366.19	366.19	367.19

101. On perusal of the Form-15 furnished by the Petitioner vide affidavit dated 31.1.2020, it is observed that the Petitioner has included opening stock of coal and its corresponding value while computing weighted average price of coal for the month of October, 2018, November, 2018 and December, 2018. However, in terms of Regulation 34(2) of the 2019 Tariff Regulations, the computation of cost of fuel as part of IWC, is to be based on the landed price and GCV of fuel as per actuals, which means that only fuel received during these three months is only to be considered and no opening stock shall be included therein. Accordingly, the opening stock of coal and its corresponding values have been excluded while computing the weighted average price and GCV of coal. Similarly, while calculating normative transit and handling losses in respect of coal the Petitioner has considered the same in excess of prescribed limit of 0.8%. Accordingly, the normative transit and handling losses of 0.8% has been considered for the purpose of tariff.

102. Also, the Petitioner has submitted two types of secondary fuel oil i.e HFO and LDO. However, in terms of Regulation 34(1)(a)(iii) of the 2019 Tariff Regulations, the working capital shall cover the 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. Therefore, in terms of the said regulation, we have considered the main secondary fuel oil as HFO. Accordingly, the weighted average price and GCV of coal and oil claimed and allowed for the period 2019-24, subject to truing up is as under:

	Claimed	**Allowed**
Weighted average price of coal (Rs./MT)	4183.05	4183.05
Weighted average GCV of coal (kCal/kg) *	2992.87	2994.50
Weighted average price of oil (Rs./KL)	39343.61	40236.90
Weighted average GCV of oil (kCal/Ltr.)	10042.90	10042.90

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

103. Accordingly, the fuel component in working capital, energy charges and ECR claimed and allowed, is as under:

(Rs. in lakh)

	Claimed		**Allowed**	
	2019-20 & 2023-24	**2020-21 to 2022-23**	**2019-20 & 2023-24**	**2020-21 to 2022-23**
Cost of coal for 50 days	50928.33		50307.37	
Cost of secondary fuel oil for 2 months	367.19	366.19	375.53	374.50
Energy charges for 45 days	46106.37		45548.95	
ECR (*Rs./kWh)*	3.608		3.545	

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

Working Capital for Maintenance Spares

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

(Rs. in lakh)

2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
7541.00	7811.69	8091.72	8381.24	8677.24

106. Regulation 34(1)(a)(iv) of the 2019 Tariff Regulations provide for maintenance

spares @ 20% of the O&M expenses (including water charges and security expenses). Accordingly, maintenance spares @ 20% of the O&M expenses (including the water charges and security expenses) allowed for the period 2019-24, is as under:

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
7541.00	7811.69	8091.72	8381.24	8677.24

Working Capital for Receivables

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

(Rs. in lakh)

	2019-20	2020-21	2021-22	2022-23	2023-24
Variable Charges - for 45 days	45548.95	45548.95	45548.95	45548.95	45548.95
Fixed Charges - for 45 days	23644.49	23187.58	22682.00	22294.14	21870.81
Total	**69193.44**	**68736.53**	**68230.95**	**67843.09**	**67419.76**

Working Capital for O&M Expenses for 1 month

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

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
3142.08	3254.87	3371.55	3492.18	3615.52

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

(Rs. in lakh)

2019-20	2020-21	2021-22	2022-23	2023-24
3142.08	3254.87	3371.55	3492.18	3615.52

Rate of Interest on working capital

110. In line with the Regulation 34(3) of the 2019 Tariff Regulations, the rate of interest on working capital is considered as 12.05% (i.e. 1 year SBI MCLR of 8.55% as on 1.4.2019 + 350 bps) for the year 2019-20, 11.25% (i.e. 1 year SBI MCLR of 7.75% as on 1.4.2020 + 350 bps) for the year 2020-21 and 10.50% (i.e. 1 year SBI MCLR of 7.00% as on 1.4.2021 + 350 bps) for the period 2021-24. Accordingly, Interest on working capital has been computed as under:

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Cost of Coal towards Stock - 20 days	20122.95	20122.95	20122.95	20122.95	20122.95
Cost of Coal towards Generation - 30 days	30184.42	30184.42	30184.42	30184.42	30184.42
Cost of Secondary fuel oil - 2 months	375.53	374.50	374.50	374.50	375.53
Maintenance Spares @ 20% of O&M expenses	7541.00	7811.69	8091.72	8381.24	8677.24
Receivables - 45 days	69193.44	68736.53	68230.95	67843.09	67419.76
O&M expenses - 1 month	3142.08	3254.87	3371.55	3492.18	3615.52
Total Working Capital	**130559.43**	**130484.97**	**130376.10**	**130398.38**	**130395.42**
Rate of Interest	12.0500%	11.2500%	10.5000%	10.5000%	10.5000%
Interest on Working Capital	**15732.41**	**14679.56**	**13689.49**	**13691.83**	**13691.52**

Annual Fixed Charges for the period 2019-24

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

(Rs. in lakh)

	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Depreciation	46802.94	46820.85	46852.70	46866.72	46934.82
Interest on Loan	39413.48	34845.36	30271.09	25647.70	21075.61
Return on Equity	52654.71	52672.85	52704.34	52717.79	52794.44
Interest on Working Capital	15732.41	14679.56	13689.49	13691.83	13691.52
O&M Expenses	37705.00	39058.45	40458.62	41906.19	43386.22
Total	**192308.54**	**188077.07**	**183976.24**	**180830.24**	**177882.61**

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

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

Application Fee and Publication expenses

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

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

115. Petition No. 411/GT/2020 is disposed of in terms of the above.

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