

- (i) The gross normative loan amounting to Rs.347774.49 lakh as on 31.3.2019 as considered in order dated 21.5.2022 in Petition No. 190/GT/2020 has been retained as on 1.4.2019;
- (ii) Cumulative repayment amounting to Rs.213253.69 lakh as on 31.3.2019 as considered in order dated 21.5.2022 in Petition No. 190/GT/2020 has been retained as on 1.4.2019;
- (iii) Accordingly, the net normative opening loan as on 1.4.2019 works out to be Rs.134520.80 lakh;
- (iv) Addition to normative loan on account of additional capital expenditure approved above has been considered;
- (v) Depreciation allowed has been considered as repayment of normative loan during the respective years of the 2019-24 tariff period.
- (vi) The Petitioner has claimed interest on loan by considering WAROI of 8.9271%, 9.0380%, 8.9671%, 8.8608% and 8.6826% for the years 2019-20, 2020-21, 2021-22, 2022-23 and 2023-24, respectively, the same has been considered subject to truing up.

32. Necessary calculation of Interest on loan is as under:

	<i>(Rs. in lakh)</i>				
	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Gross opening loan (A)	347774.49	347774.49	347774.49	349524.49	384524.49
Cumulative repayment of loan upto previous year (B)	213253.69	238323.07	263392.45	288524.91	314981.93
Net Loan Opening (C) = (A) - (B)	134520.80	109451.42	84382.04	60999.59	69542.57
Addition due to additional capital expenditure (D)	0.00	0.00	1750.00	35000.00	0.00
Repayment of Loan during the period (E)	25069.38	25069.38	25132.46	26457.02	14235.54
Net Loan Closing (F) = (C) + (D) - (E)	109451.42	84382.04	60999.59	69542.57	55307.02
Average Loan (G) = [(C+F)/2]	121986.11	96916.73	72690.81	65271.08	62424.79
Weighted Average Rate of Interest of loan (H)	8.9271%	9.0380%	8.9671%	8.8608%	8.6826%
<b>Interest on Loan (I) = (G) x (H)</b>	<b>10889.82</b>	<b>8759.33</b>	<b>6518.26</b>	<b>5783.54</b>	<b>5420.10</b>

### Depreciation

33. 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.*

(9) *Where the emission control system is implemented within the original scope of the generating station and the date of commercial operation of the generating station or unit*



thereof and the date of operation of the emission control system are the same, depreciation of the generating station or unit thereof including the emission control system shall be computed in accordance with Clauses (1) to (8) of this Regulation.

(10) Depreciation of the emission control system of an existing or a new generating station or unit thereof where the date of operation of the emission control system is subsequent to the date of commercial operation of the generating station or unit thereof, shall be computed annually from the date of operation of such emission control system based on straight line method, with salvage value of 10%, over a period of-

a) twenty five years, in case the generating station or unit thereof is in operation for fifteen years or less as on the date of operation of the emission control system; or

b) balance useful life of the generating station or unit thereof plus fifteen years, in case the generating station or unit thereof is in operation for more than fifteen years as on the date of operation of the emission control system; or

c) ten years or a period mutually agreed by the generating company and the beneficiaries, whichever is higher, in case the generating station or unit thereof has completed its useful life.”

34. Accordingly, cumulative depreciation amounting to Rs.213540.04 lakh as on 31.3.2019 as considered in order dated 21.5.2022 in Petition No. 190/GT/2020 has been considered for the purpose of tariff. The balance depreciable value before providing depreciation for the year 2019-20 works out to Rs.226451.52 lakh. Since, as on 1.4.2019, the used life of the generating station is 8.92 years, which is less than 12 years from the effective station COD of 1.5.2010, the depreciation for the period 2019-23 has been calculated by applying weighted average rate of depreciation (WAROD) as claimed by the Petitioner, subject to truing up. The WAROD computation is attached as Annexure-I. Further, since the used life of the generating station as on 1.4.2023 i.e. 12.92 years is in excess of 12 years, the deprecation for the year 2023-24 has been calculated based on spreading over of the remaining depreciable value over the balance useful life of the generating station. Necessary calculation of depreciation is as under:

	<b>(Rs. in lakh)</b>				
	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Average Capital Cost (A)	496820.70	496820.70	498070.70	524320.70	549320.70
Value of freehold land included in average capital cost (B)	7941.18	7941.18	7941.18	7941.18	7941.18
Value of software and IT equipment included in	0.00	0.00	0.00	0.00	0.00



	2019-20	2020-21	2021-22	2022-23	2023-24
average capital cost (C)*					
Depreciable Value (D)= [(A-B-C)x 90%+ (C)]	439991.57	439991.57	441116.57	464741.57	487241.57
Remaining depreciable value at the beginning of the year (E) = [(D) – (Cumulative depreciation shown at (J) at the end of the preceding period)]	226451.52	201382.14	177437.76	175930.31	171973.28
No. of completed years at the beginning of the year (F)	8.92	9.92	10.92	11.92	12.92
Balance useful life at the beginning of the year (G) = [25 - (F)]	16.08	15.08	14.08	13.08	12.08
Weighted Average Rate of Depreciation (WAROD) (H)	5.0460%	5.0460%	5.0460%	5.0460%	#
Depreciation during the year (I) = [(A) x (H)] for the period 2019-23 and [E/(G)] for the year 2023-24	25069.38	25069.38	25132.46	26457.02	14235.54
Cumulative depreciation at the end of the year (J) = [(I) + (Cumulative Depreciation (shown at J) at the end of the previous year)]**	238609.42	263678.81	288811.26	315268.28	329503.83

\* As per the Petitioner submissions, the details of IT Equipment will be provided at the time of truing up.

\*\*The cumulative depreciation at the end of 2018-19 is Rs.213540.04 lakh.

# Not applicable.

## **O&M Expenses**

35. 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 and above Series
FY 2019-20	32.96	27.74	22.51	20.26	18.23
FY 2020-21	34.12	28.71	23.30	20.97	18.87



Year	200/210/ 250 MW Series	300/ 330/ 350 MW Series	500 MW Series	600 MW Series	800 MW and above Series
FY 2021-22	35.31	29.72	24.12	21.71	19.54
FY 2022-23	36.56	30.76	24.97	22.47	20.22
FY 2023-24	37.84	31.84	25.84	23.26	20.93

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

xxx

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

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

<i>(Rs. in lakh)</i>				
2019-20	2020-21	2021-22	2022-23	2023-24
22059.80	22834.00	23637.60	24470.60	25323.20

37. As stated earlier, the generating station, with a capacity of 980 MW comprises of two unit of 490 MW each, with the effective date of commercial operation as 1.5.2010. Therefore, in terms of Regulation 35(1) of the 2019 Tariff Regulations, the O&M expenses as claimed by the Petitioner above, has been allowed for the 2019-24 tariff period.

### **Water Charges**

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

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

*Provided that water charges shall be allowed based on water consumption depending upon type of plant and type of cooling water system, subject to prudence check. The details regarding the same shall be furnished along with the petition;*

xxxxx.”



39. The actual water charges claimed by the Petitioner and allowed by order dated 21.5.2022 in Petition No. 190/GT/2020 for the 2014-19 tariff period is as follows:

<i>(in Rs. lakh/MW)</i>				
<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
187.68	178.49	164.89	171.93	152.92

40. In terms of the first proviso to Regulations 35(1)(6) of the 2019 Tariff Regulations, water charges shall be allowed separately, based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check. The details furnished by the Petitioner in respect of water charges as applicable for 2018-19 are as under:

<b>Description</b>	<b>Remarks</b>
Type of Plant	Coal Based
Type of cooling water system	Closed Cycle
Consumption of Water	485374 (1000 cft)
Rate of Water charges (Including Royalty)	Rs.32.03/1000 cft
Total Water Charges	Rs.155.48 Lakh

41. The Petitioner has claimed water charges of Rs.155.48 lakh in 2019-20, Rs.158.70 lakh in 2020-21, Rs.161.92 lakh in 2021-22, Rs.165.14 lakh in 2022-23 and Rs.168.36 lakh in 2023-24.

42. The Respondent, TPDDL has submitted that as per actual water expenses claimed by the Petitioner for the 2014-19 tariff period there has been a declining trend in water expenses with an average of (-) 5% per annum. The Respondent has further requested that in absence of the appropriate / necessary details, water charges claimed by the Petitioner may be rejected. In response, the Petitioner has clarified that water charges claimed is as per Regulation 35(1)(6) of the 2019 Tariff Regulations with nominal escalation to the expenditure incurred in 2018-19. The Petitioner has further clarified that the water charges incurred for the generating station works out to be Rs.108.57 lakh for 2019-20 and Rs 92.48 lakh for 2020-21 respectively.



43. The matter has been considered. The actual water consumption for 2019-20 and 2020-21 as submitted by the Petitioner has been considered and actual water charges for the period 2020-21 has been allowed for the years 2021-22, 2022-23 and 2023-24 respectively. However, the Petitioner shall, at the time of truing up of tariff, furnish the details of the actual water consumption (in cubic meters), rate (Rs/ Cubic meter) etc., separately. The water charges allowed are subject to the truing up, as per actual water charges paid, after prudence check. The water charges allowed for the 2019-24 tariff period are summarized as follows:

<i>(in Rs. lakh/MW)</i>				
<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
108.57	92.48	92.48	92.48	92.48

**Security Charges**

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

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

*Xxxx*

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

*Xxx”*

45. The Petitioner has claimed total security expenses of Rs.11109.52 lakh (i.e. Rs.1733.62 lakh in 2019-20, Rs.1952.54 lakh in 2020-21, Rs.2193.28 lakh in 2021-22, Rs.2462.87 lakh in 2022-23, Rs.2767.21 lakh in 2023-24) for the 2019-24 tariff period, in terms of the second proviso to Regulation 35(1)(6) of the 2019 Tariff Regulations. It has, however, not furnished any justification and the assessment of security, for the expenses claimed. It is observed that the Petitioner vide affidavit dated 4.6.2021, has submitted that the actual security expenses for the generating station for 2018-19 was Rs.1395.26 lakh. Considering the fact that security expenses for thermal generating



stations for the 2019-24 tariff period, is required to be allowed separately, after prudence check, based on the assessment of the security requirement and estimated expenses to be furnished by the Petitioner, we provisionally allow the security expenses for the 2019-24 tariff period with 5% escalation per year, on the actual expenses incurred for 2018-19 (i.e. Rs.1395.26 lakh).The Petitioner shall, at the time of truing up, furnish the actual security expenses incurred along with proper justification and assessment in terms of Regulation 35(1)(6)of the 2019 Tariff Regulations. Accordingly, the security expenses as claimed by the Petitioner and allowed are summarised below:

<i>(Rs. in lakh)</i>				
<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
1465.02	1538.27	1615.19	1695.95	1780.74

**Capital spares**

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

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

<i>(Rs. in lakh)</i>						
		<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Normative O&M Expenses under Regulation 35(1)(1) of the 2019 Tariff Regulations (A)	Claimed	22059.80	22834.00	23637.60	24470.60	25323.20
	Allowed	22059.80	22834.00	23637.60	24470.60	25323.20
Water Charges (B)	Claimed	155.48	158.70	161.92	165.14	168.36
	Allowed	108.57	92.48	92.48	92.48	92.48
Security Expenses (C)	Claimed	1733.62	1952.54	2193.28	2462.87	2767.21





		2019-20	2020-21	2021-22	2022-23	2023-24
	Allowed	1465.02	1538.27	1615.19	1695.95	1780.74
<b>Total O&amp;M expenses as allowed (including Water Charges and Security Expenses (D) = (A+B+C)</b>	Claimed	<b>23948.90</b>	<b>24945.24</b>	<b>25992.80</b>	<b>27098.61</b>	<b>28258.77</b>
	Allowed	<b>23633.39</b>	<b>24464.75</b>	<b>25345.27</b>	<b>26259.03</b>	<b>27196.42</b>

### **Fly Ash Transportation charges**

48. The Petitioner has submitted that fly ash transportation charges are recurring in nature. The Petitioner has submitted that the expenditure, which is due for recovery from the beneficiary, if gets accumulated shall attract carrying cost, if recovery is allowed at the time of truing up. Therefore, in order to avoid the interest payment/carrying cost liability of the beneficiaries, the Petitioner has prayed to recover/ pass on the ash transportation charges after adjusting the revenue earned from sale of ash subject to true-up at the end of the period. It is, however, noticed that the Petitioner has filed Petition No. 205/MP/2021 with regard to reimbursement of fly ash transportation charges in respect of its generating stations and has raised issues with regard to the higher liability of the Respondents therein on account of interest burden and cash flow issues faced by the Petitioner. Some of the Respondents therein (including UPPCL) have raised issues on 'maintainability' of Petition No. 205/MP/2021 and the Commission, after hearing the parties on 12.10.2021, has issued notices for hearing on maintainability of that petition. Therefore, the reimbursement of fly ash transportation charges will be governed by decision of the Commission in Petition No. 205/MP/2021.

### **Additional Expenditure on Emission Control System**

49. The Petitioner, in terms of the Ministry of Environment and Forests and Climate Change (MOEF&CC) notification dated 7.12.2015 has submitted that it is in the process of installing the Emission Control Systems (ECS) for this generating station. It



is however noticed that the Petitioner had filed Petition No. 467/MP/2019, for approval of additional expenditure on installation of various Emission Control Systems at this generating station, in compliance of MOEF&CC notification dated 7.12.2015 and the Commission by a common order dated 30.9.2021 had disposed of the said petition, with certain observations. Therefore, we are not deciding this issue in this petition. The claim of the Petitioner for additional expenditure on emission control system shall therefore be guided by order dated 30.9.2021 in Petition No. 467/MP/2019.

**Operational Norms**

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

Normative Annual Plant Availability Factor (NAPAF) %	85
Gross Station Heat Rate (kcal/kwh)	2382.00
Auxiliary Power Consumption %	5.75
Specific Oil Consumption (ml/kwh)	0.50

**(a) Normative Annual Plant Availability Factor**

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

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

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

**(b) Station Heat Rate**

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

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

*1.05 X Design Heat Rate (kCal/kWh)*



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

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

Pressure Rating (Kg/cm <sup>2</sup> )	150	170	170
SHT/RHT (°C)	535/535	537/537	537/565
Type of BFP	Electrical Driven	Turbine Driven	Turbine Driven
Max Turbine Heat Rate (kCal/kWh)	1955	1950	1935
Min. Boiler Efficiency			
Sub-Bituminous Indian Coal	0.86	0.86	0.86
Bituminous Imported Coal	0.89	0.89	0.89
Max. Design Heat Rate (kCal/kWh)			
Sub-Bituminous Indian Coal	2273	2267	2250
Bituminous Imported Coal	2197	2191	2174

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

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

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

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

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

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

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

Note: In respect of generating units where the boiler feed pumps are electrically operated, the maximum design heat rate of the unit shall be 40



*kCal/kWh lower than the maximum design heat rate of the unit specified above with turbine driven Boiler Feed Pump.”*

54. The Petitioner has furnished the Gross Station Heat Rate as 2382.00 kCal/kWh, based on the Guaranteed Design Gross Turbine Cycle Heat Rate of 1935.90 (kCal/kWh)<sup>3</sup> and Design / Guaranteed Boiler Efficiency of 85.34(%), as provided in the Form 2 of the petition as follows:

Main Steams Pressure at Turbine inlet	(kg/Cm <sup>2</sup> )	170
Main Steam Temperature at Turbine inlet	(°C)	537
Reheat Steam Temperature at Turbine inlet	(°C)	565
Type of BFP	(No.)	Steam Driven
Guaranteed Design Gross Turbine Cycle Heat Rate	(kCal/kWh) <sup>3</sup>	1935.90
Design / Guaranteed Boiler Efficiency	(%)	85.34

55. It is observed that the Petitioner, while computing the Station Heat Rate, has failed to take note that the Design Heat Rate of a generating unit is required to be computed, based on the heat rate guaranteed by the supplier at conditions of 100% MCR, zero percent make up, design coal and design cooling water temperature/back pressure. Therefore, the Station Heat Rate is required to be recomputed as per details provided in the Form-2 of the petition. The Petitioner, in Form-2 of the petition, has furnished the design turbine cycle heat rate and boiler efficiency of the generating station as 1935.90 kcal/kWh and 85.34% respectively. Accordingly, the unit design heat rate is worked out as 2268.46 kcal/kWh (1935.90/0.8534).

56. Considering the design parameters of the generating station, for the pressure rating of 170 Kg/cm<sup>2</sup>, super heater temperature of 537°C and re-heater temperature of 565°C, the maximum design unit heat rate is 2250 kCal/kWh, considering the Max Turbine Heat rate of 1935.00 kCal/kWh and boiler efficiency of 86%, as per the 2019 Tariff Regulations. The design heat rate of 2268.46 kCal/kWh, is more than the ceiling design heat rate of 2250.00 kCal/kWh, as provided in the 2019 Tariff Regulations. However, in terms of the above regulation, 1935.00 kCal/kWh is the maximum Turbine



Heat Rate, and the Petitioner has furnished the same as 1935.90 kcal/kWh. Further, where the boiler efficiency is below 86% for Sub-bituminous Indian coal, the same shall be considered as 86%. Therefore, the Turbine Cycle Heat rate and boiler efficiency has been considered as 1935.00 kcal/kWh and 86% respectively, for computation of design heat rate. The design heat rate of the generating station works out as 2250.00 kCal/kWh (i.e.,  $1935.00/0.86$ ), which is equal to the ceiling design heat rate of 2250.00 kCal/kWh. Hence, the GSHR has been worked out as  $2362.50 \text{ kCal/kWh} = (1.05 \times 2250.00)$  and the same has been considered for the purpose of tariff.

**(c) Auxiliary Power Consumption**

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

*“49(E) Auxiliary Energy Consumption*

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

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

*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:*

58. The Petitioner has claimed Auxiliary Power Consumption (APC) of 5.75% as per Regulation 49(E)(a)(ii) of the 2019 Tariff Regulations, and therefore same has been allowed.

**(d) Specific Oil Consumption**

59. Regulation 49(D)(a) of 2019 Tariff Regulations, provides for Secondary fuel oil consumption of 0.50 ml/kWh, for coal-based generating stations. As the Secondary



fuel oil consumption considered by the Petitioner is as per the said regulations, the same is allowed for determination of tariff for the 2019-24 period.

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

Normative Annual Plant Availability Factor (NAPAF) (%)	85
Heat Rate (kCal/kWh)	2362.50
Auxiliary Power Consumption (%)	5.75
Specific Oil Consumption (ml/kWh)	0.50

### **Interest on Working Capital**

61. Regulations 34(1)(a), (3) and (4) and 3(7) of the 2019 Tariff Regulations specify as follows:

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

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

- (i) *Cost of coal or lignite and limestone towards stock, if applicable, for 10 days for pit-head generating stations and 20 days for non-pit-head generating stations for generation corresponding to the normative annual plant availability factor or the maximum coal/lignite stock storage capacity whichever is lower;*
- (ii) *Advance payment for 30 days towards cost of coal or lignite and limestone for generation corresponding to the normative annual plant availability factor;*
- (iii) *Cost of secondary fuel oil for two months for generation corresponding to the normative annual plant availability factor, and in case of use of more than one secondary fuel oil, cost of fuel oil stock for the main secondary fuel oil;*
- (iv) *Maintenance spares @ 20% of operation and maintenance expenses including water charges and security expenses;*
- (v) *Receivables equivalent to 45 days of capacity charge and energy charge for sale of electricity calculated on the normative annual plant availability factor;*  
*and*
- (vi) *Operation and maintenance expenses, including water charges and security expenses, for one month.*

**(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 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) xxxx

(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 1<sup>st</sup> 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.”

“3. Definitions. - In these regulations, unless the context otherwise requires:-

(7) ‘Bank Rate’ means the one year marginal cost of lending rate (MCLR) of the State Bank of India issued from time to time plus 350 basis points;”

### **Fuel Cost for computation of working capital**

62. The Petitioner has claimed ECR of 3.520 Rs/kWh and fuel component in working capital as follows:

	<b>(Rs. in lakh)</b>				
	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Cost of coal for 50 days	32934.66	32934.66	32934.66	32934.66	32934.66
Cost of Secondary fuel oil for 2 months	282.70	281.93	281.93	281.93	282.70



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

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

64. It is observed that the Petitioner has furnished revised Form-15, indicating the opening stock of coal and coal received during the months of October 2018, November 2018 and December 2018, separately. On perusal of the data furnished by the Petitioner, it is observed that the Petitioner, while computing the landed cost of fuel, has considered the opening stock of coal for the months of October 2018, November 2018 and December 2018 (closing stock of the coal for the previous months). However, in terms of the Regulation 39 of the 2019 Tariff Regulations, the computation of ECR and associated fuel components, in interest on working capital, is based on the landed price and GCV of fuel, which means that the fuel received during the specified three months (October 2018, November 2018 and December 2018) is only to be considered, without opening stock. Similarly, while calculating the weighted average price of the coal, the Petitioner has used the normative Transit & Handling loss of 0.8005% for October 2018, 0.8005% for November 2018 and 0.8006% for December 2018 which is more than applicable normative Transit & Handling loss of 0.80% for the generating station. Accordingly, the normative cost of coal for 50 days and normative Transit & Handling loss of 0.80% has been considered for the calculation of working capital requirements. After excluding the opening stock value, we have worked out the weighted average landed cost and weighted average GCV of





coal for working out the fuel component in working capital for the months of October 2018, November 2018 and December 2018 as follows:

	<b>Claimed</b>	<b>Allowed</b>
Weighted average price of coal (Rs./MT)	5135.17	5124.96
Weighted average GCV of coal (kCal/kg) *	3704.88	3706.61
Weighted average price of oil (Rs./kl)	46363.05	34387.42
Weighted average GCV of oil (kCal/l)	9809.72	9809.66

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

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

	<b>(Rs. in lakh)</b>				
	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Cost of Coal/Lignite for Stock (20 Days)	13033.76	13033.76	13033.76	13033.76	13033.76
Cost of Coal/Lignite for Generation (30 Days)	19550.64	19550.64	19550.64	19550.64	19550.64
Cost of Secondary fuel oil 2 months	209.68	209.11	209.11	209.11	209.68

### **Energy Charge Rate (ECR)**

66. The Petitioner has claimed ECR (ex-bus) of 3.520 Rs/kWh, based on the weighted average price, GCV of coal & oil procured and burnt for the preceding months of October 2018, November, 2018 and December, 2018. ECR, as worked out, based on the operational norms specified under the 2019 Tariff Regulations and on “as received” GCV of coal for the preceding three months i.e., October 2018, November, 2018 and December 2018, have been considered for allowing two months of energy charge in working capital as follows:

<b>Description</b>	<b>Unit</b>	<b>2019-24</b>
Capacity	MW	980.00
Gross Station Heat Rate	kCal/kWh	2362.50
Auxiliary Energy Consumption	%	5.75
Weighted average GCV of oil	kCal/lit	9809.66
Weighted average GCV of coal	kCal/kg	3706.61 (3791.61-85.00)
Weighted average price of oil	Rs/KL	34387.42



Description	Unit	2019-24
Weighted average price of Coal	Rs/MT	5124.96
Rate of energy charge ex-bus	Rs/kWh	3.477

**Working capital for O&M Expenses for one month**

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

*(Rs. in lakh)*

2019-20	2020-21	2021-22	2022-23	2023-24
1995.74	2078.77	2166.07	2258.22	2354.90

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

*(Rs. in lakh)*

2019-20	2020-21	2021-22	2022-23	2023-24
1969.45	2038.73	2112.11	2188.25	2266.37

**Working capital for Maintenance Spares**

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

*(Rs. in lakh)*

2019-20	2020-21	2021-22	2022-23	2023-24
4726.68	4892.95	5069.05	5251.81	5439.28

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

**Working capital for Receivables**

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



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

	<i>(Rs. in lakh)</i>				
	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Energy charge for 45 days	29481.86	29481.86	29481.86	29481.86	29481.86
Fixed charge for 45 days	11968.00	11761.18	11530.74	11809.05	10408.33
	<b>41449.85</b>	<b>41243.04</b>	<b>41012.60</b>	<b>41290.91</b>	<b>39890.19</b>

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

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

***Rate of Interest on working capital***

74. 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. 1year SBI MCLR of 8.55% as on 01.04.2019 + 350 bps) for the year 2019-20, 11.25% (i.e. 1 year SBI MCLR of 7.75% as on 01.04.2020 + 350 bps) for the year 2020-21 and 10.50% (i.e. 1 year SBI MCLR of 7.00% as on 01.04.2021 + 350 bps) for the period 2021-24.

75. Accordingly, Interest on working capital has been computed as under:



**(Rs. in lakh)**

	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Cost of Coal - 20 days (A)	13033.76	13033.76	13033.76	13033.76	13033.76
Cost of Coal - 30 days (B)	19550.64	19550.64	19550.64	19550.64	19550.64
Cost of Secondary fuel- 2 Months (C)	209.68	209.11	209.11	209.11	209.68
Maintenance Spares- 20% of O&M (D)	4726.68	4892.95	5069.05	5251.81	5439.28
Receivables - 45 days (E)	41449.85	41243.04	41012.60	41290.91	39890.19
O&M expenses - 1 month (F)	1969.45	2038.73	2112.11	2188.25	2266.37
<b>Total Working Capital (G) = (A+B+C+D+E+F)</b>	<b>80940.06</b>	<b>80968.22</b>	<b>80987.26</b>	<b>81524.47</b>	<b>80389.92</b>
Rate of Interest (H)	12.05%	11.25%	10.50%	10.50%	10.50%
<b>Total Interest on Working capital (I) = (G x H)</b>	<b>9753.28</b>	<b>9108.92</b>	<b>8503.66</b>	<b>8560.07</b>	<b>8440.94</b>

### **Annual Fixed Charges**

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

**(Rs. in lakh)**

	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Depreciation	25069.38	25069.38	25132.46	26457.02	14235.54
Interest on Loan	10889.82	8759.33	6518.26	5783.54	5420.10
Return on Equity	27993.86	27993.86	28027.49	28724.89	29361.43
Interest on Working Capital	9753.28	9108.92	8503.66	8560.07	8440.94
O&M Expenses	23633.39	24464.75	25345.27	26259.03	27196.42
<b>Total</b>	<b>97339.73</b>	<b>95396.25</b>	<b>93527.13</b>	<b>95784.55</b>	<b>84654.44</b>

77. 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**

78. The Petitioner has sought reimbursement of the fees paid by it for filing of the tariff petition and for publication expenses and has submitted that the reimbursement of the same are in accordance with Regulation 70(1) of the 2019 Tariff Regulations. In view of the above, the Petitioner is entitled for reimbursement of the filing fees and publication expenses in connection with the filing of this petition, directly from the beneficiaries, on pro-rata basis, in accordance with Regulation 70(1) of the 2019 Tariff Regulations.



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

80. Annexure-I attached herewith form part of the order.

81. Petition No. 2/GT/2021 is disposed of in terms of the above.

**Sd/-**  
**(Pravas Kumar Singh)**  
**(Member)**

**Sd/-**  
**(I. S. Jha)**  
**(Member)**

**Sd/-**  
**(P. K. Pujari)**  
**(Chairperson)**



**Annexure-I**

**Depreciation for the 2019-24 tariff period**

Sr. No.	Name of Asset	Gross Block as on 31.3.2019	CERC Depreciation Rate	(Rs. in lakh)
				Cumulative Depreciation as on 31.3.2019
1	Freehold Land	7941.18	0.00%	
2	Roads, bridges, culverts & helipads	3478.07	3.34%	116.17
3	Main Plant Buildings	35632.62	3.34%	1190.13
4	Other Buildings	5917.40	3.34%	197.64
5	Temporary erection	0.00	100.00%	0.00
6	Water supply, drainage & sewage	675.39	5.28%	35.66
7	MGR track and signaling system	767.29	5.28%	40.51
8	Railway siding	5844.35	5.28%	308.58
9	Earth dam reservoir	4001.44	5.28%	211.28
10	Plant and machinery	424047.18	5.28%	22389.69
11	Furniture and fixtures	2135.91	6.33%	135.20
12	Other Office Equipments	1022.55	6.33%	64.73
13	EDP, WP machines & SATCOM equipment	975.68	6.33%	61.76
14	Vehicles including speedboats	27.07	9.50%	2.57
15	Construction equipment	1541.26	5.28%	81.38
16	Electrical installations	2021.03	5.28%	106.71
17	Communication equipment	327.86	6.33%	20.75
18	Hospital equipment	179.49	5.28%	9.48
19	Laboratory and workshop equipment	70.20	5.28%	3.71
20	Software	265.67	15.00%	39.85
21	Capex on assets not owned by the company	0.00	5.28%	0.00
22	Right of Use - Others	23992.92	5.28%	1266.83
	<b>Total</b>	<b>520864.56</b>	<b>-</b>	<b>26282.63</b>
	<b>Weighted Average Rate of Depreciation (%)</b>			<b>5.0460</b>

