

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 733/TT/2020**

**Coram:**

**Shri P.K. Pujari, Chairperson  
Shri I.S. Jha, Member  
Shri P. K. Singh, Member**

**Date of order: 20.05.2022**

**In the Matter of:**

Approval under Regulation 86 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and revision of transmission tariff of 2001-04, 2004-09 and 2009-14 tariff periods, truing up of transmission tariff of 2014-19 period under Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 and determination of transmission tariff of 2019-24 period under Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 for 400 kV Kahalgaon Transmission System in Eastern Region.

**And in the Matter of:**

Power Grid Corporation of India Limited,  
"Saudamini", Plot No-2, Sector-29,  
Gurgaon-122001(Haryana).

**.....Petitioner**

**Vs.**

1. Bihar State Power (Holding) Company Limited,  
(Formerly Bihar State Electricity Board -BSEB),  
Vidyut Bhavan, Bailey Road,  
Patna-800001.
2. West Bengal State Electricity Distribution Company Limited,  
Bidyut Bhawan, Bidhan Nagar,  
Block DJ, Sector-II, Salt Lake city,  
Calcutta-700091.
3. Grid Corporation of Orissa Limited,  
Shahid Nagar,  
Bhubaneswar-751007.
4. Jharkhand State Electricity Board, In Front of Main Secretariat,  
Doranda,  
Ranchi-834002.



5. Damodar Valley Corporation, DVC Tower,  
Maniktala, Civic Centre, VIP road,  
Calcutta-700054.

6. Power Department,  
Government of Sikkim,  
Gangtok-737101.

...Respondent(s)

**For Petitioner** : Shri S.S. Raju, PGCIL  
Shri A.K. Verma, PGCIL  
Shri B. Dash, PGCIL

**For Respondents** : Shri Nishant Kumar, Advocate, BSPHCL

### **ORDER**

The instant petition has been filed by Power Grid Corporation of India Limited, a deemed transmission licensee, for revision of transmission tariff of 2001-04, 2004-09 and 2009-14 periods, for truing up of transmission tariff of 2014-19 tariff period under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as “the 2014 Tariff Regulations”) and for determination of tariff of 2019-24 tariff period under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as “ the 2019 Tariff Regulations”) for 400 kV Kahalgaon Transmission System (hereinafter referred to as the “transmission asset”) in Eastern Region.

2. The Petitioner has made the following prayers in this petition:

*“1) Approve the trued up Transmission Tariff for 2014-19 block and transmission tariff for 2019-24 block for the assets covered under this petition, as per para 9 and 10 above.*

*2) Allow the capital cost including the additional capitalization/ DE-capitalization going to be incurred during 2019-24 period as claimed by petitioner*

*3) a) Allow the petitioner to recover the shortfall or refund the excess Annual Fixed Charges, on account of Return on Equity due to change in applicable Minimum Alternate/Corporate Income Tax rate as per the Income Tax Act, 1961 (as amended*



from time to time) of the respective financial year directly without making any application before the Commission as provided in Tariff Regulation 2014 and Tariff regulations 2019 as per para 9 and 10 above for respective block.

b) It is further submitted that deferred tax liability before 01.04.2009 shall be recoverable from the beneficiaries or long term transmission customers /DICs as the case may be, as and when materialized as per regulation 49 of 2014 and regulation 67 of 2019 tariff regulation. The petitioner may be allowed to recover the deferred tax liability materialized directly without making any application before the commission as provided in the regulation.

4) Approve the reimbursement of expenditure by the beneficiaries towards petition filing fee, and expenditure on publishing of notices in newspapers in terms of Regulation 70 (1) Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019, and other expenditure ( if any) in relation to the filing of petition

5) Allow the petitioner to bill and recover Licensee fee and RLDC fees and charges, separately from the respondents in terms of Regulation 70 (3) and (4) Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019.

6) Allow the petitioner to bill and adjust impact on Interest on Loan due to change in Interest rate on account of floating rate of interest applicable during 2019-24 period, if any, from the beneficiaries.

7) Allow the petitioner to file a separate petition before Hon'ble Commission for claiming the overall security expenses and consequential IOWC on that security expenses as mentioned at para 10.5 above.

8) Allow the petitioner to claim the capital spares at the end of tariff block as per actual.

9) Allow the Petitioner to bill and recover GST on Transmission Charges separately from the respondents, if GST on transmission is levied at any rate in future. Further, any taxes including GST and duties including cess etc. imposed by any statutory/Govt./municipal authorities shall be allowed to be recovered from the beneficiaries.

and pass such other relief as Hon'ble Commission deems fit and appropriate under the circumstances of the case and in the interest of justice.”

### **Backdrop of the case**

3. The brief facts of the case are as follows:



(a) The approval for revised cost estimates of ₹22375.00 lakh was accorded by the Ministry of Power vide its letter dated 1.6.1992 and 7.9.1992 as mentioned in the order dated 14.12.2005 in Petition No. 127/2004.

(b) The project scope as per investment approval is as under:

**Transmission Lines**

- i. Kahalgaon- Maithon AC D/C Line
- ii. Maithon- Jamshedpur AC D/C Line
- iii. Jamshedpur- Rourkela AC S/C Line

**Sub-stations**

400 kV Line Bays: 15

(c) The complete scope of the work as per I.A. is covered in the instant Petition.

(d) The Commission vide order dated 13.12.2015 in Petition No. 535/TT/2014 recognised the fact that the instant transmission assets were put into commercial operation from 1.3.1993 to 1.10.1994. Scrutiny of earlier orders reveal that COD of transmission lines in transmission system varies from 1.3.1993 to 1.10.1994. The Petitioner in the instant petition has claimed the COD of instant assets as 1.4.1997. We do not see any reason for deviating from earlier orders regarding COD of the transmission assets. Accordingly, we consider COD of the instant assets as 1.3.1993 to 1.10.1994

(e) The transmission tariff for the transmission asset up to 31.3.2009 were approved vide order dated 14.12.2005 in Petition No. 127/2004 and was further revised vide order dated 7.2.2008.

(f) The transmission tariff for the transmission asset from 1.4.2009 to 31.3.2014 was determined vide order dated 2.5.2011 in Petition No. 254/2010. Further, the transmission tariff of 2009-14 tariff period was trued-up



and transmission tariff for 2014-19 period was determined vide order dated 30.12.2015 in Petition No. 535/TT/2014.

(g) The loans deployed for the transmission assets were already re-paid up to 2001-02. Hence, there is no impact of IoL. No ACE is claimed for the 2001-04 and 2004-09 tariff period. Hence, there is no impact of maintenance spares on working capital. Therefore, there is no need for revision of transmission charges of 2001-04, 2004-09 and 2009-14 tariff periods.

4. The Respondents are distribution licensees, power departments and transmission licensees which are procuring transmission service from the Petitioner mainly beneficiaries of the Eastern Region.

5. The Petitioner has served the petition on the Respondents and notice regarding filing of this petition has been published in the newspapers in accordance with Section 64 of the Electricity Act, 2003. No comments or suggestions have been received from the general public in response to the aforesaid notice published in the newspaper by the Petitioner. Bihar State Power (Holding) Company Ltd. (BSPHCL), Respondent No. 1, has filed its unnotarised reply dated 18.6.2021 and has raised the issues like grossing up of RoE, effective tax rate, ACE, GST, floating rate of interest and security expenses. In response, the Petitioner herein has filed a rejoinder vide affidavit dated 25.6.2021.

6. The hearing in this matter was held on 8.6.2021 through video conference and order was reserved.

7. Having heard the representatives of the Petitioner and counsel for BSPHCL and having perused the material on record, we proceed to dispose of the petition.



8. This order is issued considering the submissions made by the Petitioner in the Petition vide affidavits dated 3.3.2021 and 31.5.2021, BSPHCL's reply and Petitioner's rejoinder thereto.

### **Truing up of Annual Fixed Charges for 2014-19 Tariff Period**

9. The details of the trued-up transmission charges claimed by the Petitioner in respect of the transmission asset are as follows:

(₹ in lakh)					
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	345.53	353.17	365.36	369.83	372.51
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on equity	1934.12	1949.02	1948.72	1949.62	1956.46
Interest on Working Capital	119.02	121.76	124.31	126.79	129.45
O & M Expenses	1204.57	1244.80	1286.10	1328.75	1372.81
<b>Total</b>	<b>3603.24</b>	<b>3668.75</b>	<b>3724.49</b>	<b>3774.99</b>	<b>3831.23</b>

10. The details of the Interest on Working Capital (IWC) claimed by the Petitioner in respect of the transmission asset are as follows:

(₹ in lakh)					
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
O&M expenses	100.38	103.73	107.18	110.73	114.40
Maintenance Spares	180.69	186.72	192.92	199.31	205.92
Receivables	600.54	611.46	620.75	629.17	638.54
<b>Total</b>	<b>881.61</b>	<b>901.91</b>	<b>920.85</b>	<b>939.21</b>	<b>958.86</b>
Rate of Interest (%)	13.50	13.50	13.50	13.50	13.50
<b>Interest</b>	<b>119.02</b>	<b>121.76</b>	<b>124.31</b>	<b>126.79</b>	<b>129.45</b>

### **Capital Cost as on 1.4.2014**

11. The capital cost of the transmission asset has been calculated in accordance with Regulations 9(3) and 9(6) of the 2014 Tariff Regulations.

12. The Commission vide order dated 30.12.2015 in Petition No. 535/TT/2014 approved the transmission tariff in respect of the transmission asset for 2014-19



period based on admitted capital cost of ₹20014.61 lakh as on 1.4.2014 and ACE of ₹107.40 lakh during the 2014-19 tariff period as shown under:

Admitted Capital cost as on 31.3.2014	ACE					Capital Cost as on 31.3.2019
	2014-15	2015-16	2016-17	2017-18	2018-19	(₹ in lakh)
20014.61	107.40	0.00	0.00	0.00	0.00	20122.01

### **Additional Capital Expenditure (ACE)**

13. The Petitioner in the instant true-up petition has claimed ACE in 2014-19 tariff block as per Regulation 14(3)(vii) and 14(3)(ix) of 2014 Tariff Regulations. The ACE claimed by Petitioner is as follows:

Actual cost as on 31.3.2014		Actual Add cap/decap during 2014-19 period					Actual cost as on 31.3.2019
		2014-15	2015-16	2016-17	2017-18	2018-19	(₹ in lakh)
20014.61	<b>Add cap</b>	183.09	20.64	174.54	27.65	26.25	20343.78
	<b>De-cap</b>	0.00	0.00	(103.00)	0.00	0.00	

14. The Petitioner has submitted that completion cost as on 31.3.2019 has increased in comparison to approved cost in previous order and is due to following reasons:

#### **a. Additional O&M and Add Cap during 2014-19:**

The 400 kV D/C Maithon-Jamsedpur Transmission Line has completed 30 years of life by 2019. The ageing rusting of legs was observed at many locations which was removed by providing some additional member and anti-rust paint. Further, many defective insulator strings have been identified by PID and those insulator strings were replaced to avoid unwanted tripping of



line. Existing spike earthing is already strengthened as higher value is observed at many locations.

**b. Replacement of Circuit Breakers (CBs) at Jamshedpur Sub-station:**

The CBs have completed 25 years of useful service. The installed CBs are pneumatic type and having lot of issues with pneumatic system, operating mechanism and SF6 gas leakage from various joints. Frequent failure of auxiliary contact of CB has also been witnessed in many CBs. CBs have become obsolete. Neither timely support from OEM nor spares are not available. Accordingly, these CBS are already replaced in 2016-17.

15. BSPHCL has submitted that the Petitioner has mentioned that many defective insulator string have been identified by PID, but failed to provide any PID report evidencing the same. BSPHCL further submitted that the Petitioner may be directed to submit the RPC minutes and records with regard to replacement of CB at Jamshedpur Sub-station. In response, the Petitioner has submitted the PID report but has not submitted the RPC minutes.

16. We have considered the submissions of Petitioner and BSPHCL. The Petitioner in the instant true-up petition has claimed actual ACE of ₹432.17 lakh and decapitalization of ₹103.00 lakh i.e. a net ACE of ₹329.17 lakh towards tower strengthening works and replacement of CBs at Jamshedpur Sub-station.

17. The Commission vide order dated 30.12.2015 in Petition No.535/TT/2014 has already allowed ACE towards tower strengthening work of 400 kV D/C Kahalgaon-Maithon and 400 kV S/C Jamshedpur-Rourkela-I in accordance with sub clause (ix) of clause (3) of the Regulations 14 of the 2014 Tariff Regulations. The Petitioner in the instant petition has claimed actual ACE of ₹261.40 towards tower strengthening work of 400 kV D/C Kahalgaon-Maithon and 400 kV S/C Jamshedpur- Rourkela-I





and the same has been allowed under sub clause (ix) of clause (3) of the Regulations 14 of the 2014 Tariff Regulations.

18. The Petitioner has replaced CBs at Jamshedpur Sub-station and claimed net ACE of ₹67.77 lakh towards replacement of CBs. The Petitioner on its own has replaced CBs at Jamshedpur Sub-station. Therefore, we are not inclined to allow ACE towards replacement of CBs at Jamshedpur Sub-station. However, the Petitioner may claim the same with detailed clarifications and reasons for replacing CBs at the time of filing fresh Petition for the proposed ACE for 2019-24 period as mentioned at paragraph 57.

19. The ACE allowed during 2014-19 is as follows:

Asset	Actual cost as on 31.3.2014		Actual Add Cap/De-Cap during 2014-19 period					Actual cost as on 31.3.2019
			2014-15	2015-16	2016-17	2017-18	2018-19	
1	20014.61	<b>Add Cap</b>	183.09	20.64	3.77	27.65	26.25	20276.01
		<b>De-Cap</b>	0.00	0.00	0.00	0.00	0.00	

#### **Capital Cost considered for truing-up of tariff for 2014-19 period**

20. The capital cost considered for truing-up of tariff for 2014-19 tariff period is as follows:

(₹ in lakh)		
Capital Cost as on 1.4.2014	ACE during 2014-19 Period	Capital Cost as on 31.3.2019
20014.61	261.40	20276.01

#### **Debt-Equity Ratio**

21. The debt-equity ratio has been allowed in accordance with Regulation 19(3) of the 2014 Tariff Regulations. As per Regulation 19(3) of the 2014 Tariff Regulations, the debt-equity ratio allowed by the Commission for determination of tariff for the period ending on 31.3.2014 shall be considered. Accordingly, the



admitted debt-equity ratio of 50.90:49.10 for the period ending on 31.3.2014 has been considered as opening debt-equity ratio as on 1.4.2014 for the purpose of truing up of tariff of the 2014-19 tariff period of the transmission asset. The details of debt-equity ratio in respect of the transmission asset as on the date of 1.4.2014 and as on 31.3.2019 is as follows:

Particulars	As on 1.4.2014		As 31.3.2019	
	Amount (₹ in lakh)	(in %)	Amount (₹ in lakh)	(in %)
Debt	10186.69	50.90	10369.67	51.14
Equity	9827.92	49.10	9906.34	48.86
<b>Total</b>	<b>20014.61</b>	<b>100.00</b>	<b>20276.01</b>	<b>100.00</b>

### **Depreciation**

22. The Commission in order dated 17.2.2004 in Petition No. 25/2002 observed that the average useful life of the transmission system as a whole is 32 years. As the assets are in operation for period of about 7 years as on 1.4.2001, the balance useful life of the transmission assets is 25 years (32-7) as on 1.4.2001. The relevant portion of the order dated 17.2.2004 in Petition No. 25/2002 is as follows:

*“27. One asset is in operation for about 8 years and three assets for about 7 years. Therefore, on an average entire assets of the project are in operation for about 7 years as on 1.4.2001. As per the notification dated 26.3.2001, the useful life of the transmission line at 66 kV and above is 35 years, for sub-station equipment 25 years, for communication equipment (PLCC) it is 15 years and for building it is 50 years. The present petition covers transmission lines, sub-stations, PLCC equipment and buildings. The cost of individual line is not available. Therefore, useful life of the assets has to be average life of all the assets. The weighted average life of the assets has been calculated by taking completed cost of the line and substations as weights as given below:*

<u>Items</u>	<u>Completed cost</u>	<u>Useful life</u>
Line cost	Rs. 10488.00 lakh	35 years
Substation cost	Rs. 7696.00 lakh	25 years
PLCC	Rs. 61.00 lakh	15 years
Buildings	Rs. 937.00 lakh	50 years



$$\text{Weighted average life} = \frac{10488.00 \times 35 + 7696.00 \times 25 + 61.00 \times 15 + 937.00 \times 50}{10488.00 + 7696.00 + 61.00 + 937.00}$$

$$= 31.66 \text{ years (say 32 years)}$$

28. It may be seen that the average useful life of the Transmission System as a whole is 32 years. The assets are in operation for period of about 7 years (average) as on 1.4.2001. Accordingly, the balance useful life of the assets in this petition works out to 25 years (32-7) as on 1.4.2001.”

23. Accordingly upto 1.4.2014 the elapsed life is 20 years and the remaining useful life is 12 years.

24. The Petitioner has claimed depreciation considering capital expenditure of ₹20014.61 lakh as on 1.4.2014 in respect of the transmission asset. The Petitioner has decapitalized ₹103 lakh in respect of CBs at Jamshedpur Sub-station during 2016-17.

25. The transmission system has already completed 12 years before 1.4.2014. Accordingly, depreciation has been calculated based on the remaining depreciable value to be recovered over the balance useful life. Thus, the depreciation allowed during 2014-19 period is as follows:

		(₹ in lakh)				
<b>Particulars</b>		<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
A	Opening Gross Block	20014.61	20197.70	20218.34	20222.11	20249.76
B	ACE	183.09	20.64	3.77	27.65	26.25
C	Closing Gross Block (A+B)	20197.70	20218.34	20222.11	20249.76	20276.01
D	Average Gross Block [(A+C)/2]	20106.16	20208.02	20220.23	20235.94	20262.89
E	Average Gross Block (90% depreciable assets)	19857.14	19959.00	19971.21	19986.92	20013.87
F	Average Gross Block (100% depreciable assets)	0.00	0.00	0.00	0.00	0.00
G	Depreciable value (excluding IT equipment and software) (E*90%)	17871.42	17963.10	17974.08	17988.22	18012.48
H	Depreciable value of IT equipment and software	0.00	0.00	0.00	0.00	0.00



I	Depreciable value of SCADA	0.00	0.00	0.00	0.00	0.00
J	Total Depreciable Value (G+H+I)	17871.42	17963.10	17974.08	17988.22	18012.48
K	Weighted Average Rate of Depreciation (WAROD) (in %)	1.86	1.89	1.90	1.90	1.92
L	Elapsed useful life at the beginning of the year (Year)	20	21	22	23	24
M	Balance useful life at the beginning of the year (Year)	12	11	10	9	8
N	<b>Depreciation during the year (D*K)</b>	<b>374.32</b>	<b>382.65</b>	<b>383.75</b>	<b>385.32</b>	<b>388.35</b>
O	Aggregate Cumulative Depreciation at the end of the year	13753.93	14136.58	14520.33	14905.65	15294.00
P	Remaining Aggregate Depreciable Value at the end of the year (J-O)	4117.49	3826.52	3453.75	3082.57	2718.47

26. The details of depreciation approved vide order dated 30.12.2015 in Petition No. 535/TT/2014, depreciation claimed in the instant petition and trued-up depreciation allowed in the instant order in respect of the transmission asset are as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Approved vide order dated 30.12.2015 in Petition No. 535/TT/2014	371.48	375.87	375.87	375.87	375.87
Claimed by the Petitioner in the instant petition	345.53	353.17	365.36	369.83	372.51
Allowed after true-up in this order	374.32	382.65	383.75	385.32	388.35

### **Interest on Loan (“IoL”)**

27. The Petitioner has not claimed any interest on loan. Therefore, no interest on loan has been considered in this order.



### **Return on Equity (“RoE”)**

28. The Petitioner has claimed RoE in respect of the transmission asset in terms of Regulations 24 and 25 of the 2014 Tariff Regulations. The Petitioner has submitted that they are liable to pay income tax at MAT rates and has claimed following effective tax rates for 2014-19 tariff period:

<b>Year</b>	<b>Claimed effective tax rate (in %)</b>	<b>Grossed up RoE (in %) [(Base Rate)/(1-t)]</b>
2014-15	21.018	19.624
2015-16	21.382	19.716
2016-17	21.338	19.705
2017-18	21.337	19.704
2018-19	21.549	19.758

29. BSPHCL has submitted that grossed up rate of return on equity has to be trued up only on the basis of actual tax paid and Regulation 25(3) of the 2014 Tariff Regulations does not contemplate the claim of differential tariff on this account directly from the beneficiaries. BSPHCL further submitted that the effective tax rates based on MAT rates arrived at by the Commission in Petition No. 274/TT/2019 should be considered for the purpose of grossing up of RoE.

30. In response, the Petitioner submitted that the Commission has already determined the effective tax percentage to arrive at grossed-up Return on Equity (RoE). The Petitioner has further prayed to allow it to recover the differential tariff directly from the beneficiaries.

31. We have considered the submissions of the Petitioner and BSPHCL. The Commission in order dated 27.4.2020 in Petition No. 274/TT/2019 has arrived at the effective tax rate based on the notified MAT rates and the same is as follows:

<b>Year</b>	<b>Notified MAT rates (in %) (inclusive of surcharge &amp; cess)</b>	<b>Effective tax (in %)</b>
2014-15	20.961	20.961
2015-16	21.342	21.342
2016-17	21.342	21.342



2017-18	21.342	21.342
2018-19	21.549	21.549

32. The MAT rates as allowed vide order dated 27.4.2020 in Petition No. 274/TT/2019 are considered for the purpose of grossing up of rate of RoE for true-up of the tariff of 2014-19 tariff period in terms of the provisions of the 2014 Tariff Regulations and the same is as follows:

Year	Notified MAT rates (in %) (inclusive of surcharge & cess)	Base rate of RoE (in %)	Grossed up RoE (in %) [(Base Rate)/(1-t)]
2014-15	20.961	15.50	19.610
2015-16	21.342	15.50	19.705
2016-17	21.342	15.50	19.705
2017-18	21.342	15.50	19.705
2018-19	21.549	15.50	19.758

33. Accordingly, the RoE allowed in respect of the transmission asset is as follows:

		(₹ in lakh)				
	Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
A	Opening Equity	9827.92	9882.85	9889.04	9890.17	9898.47
B	Addition due to Net ACE	54.93	6.19	1.13	8.30	7.88
C	Closing Equity (A+B)	9882.85	9889.04	9890.17	9898.47	9906.34
D	Average Equity [(A+B)/2]	9855.38	9885.94	9889.60	9894.32	9902.40
E	Return on Equity (Base Rate) (%)	15.500	15.500	15.500	15.500	15.500
F	Tax Rate applicable (%)	20.961	21.342	21.342	21.342	21.549
G	Applicable ROE Rate (%)	19.610	19.705	19.705	19.705	19.758
H	<b>Return on Equity for the year</b>	<b>1932.64</b>	<b>1948.03</b>	<b>1948.75</b>	<b>1949.68</b>	<b>1956.52</b>

34. The details of RoE approved vide order dated 30.12.2015 in Petition No. 535/TT/2014, RoE claimed in the instant petition and true-up RoE allowed in the instant order in respect of the transmission asset are as follows:

		(₹ in lakh)				
	Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
	Approved vide order dated 30.12.2015 in Petition No. 535/TT/2014	1930.41	1933.57	1933.57	1933.57	1933.57
	Claimed by the Petitioner in the instant petition	1934.12	1949.02	1948.72	1949.62	1956.46
	Allowed after true-up in this order	1932.64	1948.03	1948.75	1949.68	1956.52



## Operation & Maintenance Expenses (O&M Expenses)

35. The details of the O&M Expenses claimed by the Petitioner are as follows:

(₹ in lakh)

<b>Transmission lines</b>					
<b>Sl. No.</b>	<b>Name of Line</b>	<b>Single Circuit / Double Circuit</b>	<b>No of Sub-Conductors</b>	<b>Line Length km</b>	
1	Twin Conductor D/C Kahalgaon-Maithon Transmission Line	Double Circuit	2	172	
2	Twin Conductor D/C Maithon –Jamshedpur Transmission Line	Double Circuit	2	153	
3	Twin Conductor S/C Jamshedpur –Rourkela Transmission Line	Single Circuit	2	174	
<b>Sl. No.</b>	<b>400 kV Sub-station bay</b>				
1	Maithon:Maithon-Kahalgaon-I				
2	Maithon:Maithon-Kahalgaon-II				
3	Maithon: Bus Reactor				
4	Maithon:Maithon-Jamshedpur-I				
5	Maithon: ICT I				
6	Maithon: ICT II				
7	Rourkela:ICT-II				
8	Jamshedpur: Bus Reactor-II				
9	Jamshedpur: ICT I				
10	Jamshedpur: Jamshedpur-Maithon				
11	Jamshedpur: Jamshedpur-Maithon				
12	Rourkela: Rourkela- Jamshedpur				
13	Jamshedpur: Jamshedpur- Rourkela				
14	Biharsharif:ICT-II				
15	Rourkela:ICT-I				
<b>O&amp;M Expenses</b>					
	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
<b>Sub-station</b>					
400 kV					
Number of bays	15	15	15	15	15
<b>Transmission lines</b>					
S/C (Twin/Triple Conductor)	174	174	174	174	174
Double Circuit (Twin/Triple Conductor)	325	325	325	325	325
<b>Total O&amp;M Expense (₹ in lakh)</b>	<b>1204.57</b>	<b>1244.81</b>	<b>1286.09</b>	<b>1328.75</b>	<b>1372.81</b>



36. Regulation 29(3) of the 2014 Tariff Regulations specifies the norms for O&M Expenses for the transmission system. The norms specified in respect of the elements covered in the transmission asset are as follows:

Element	UoM	Norms for 2014-15	Norms for 2015-16	Norms for 2016-17	Norms for 2017-18	Norms for 2018-19
400 kV Sub-station	₹ lakh/bay	60.30	62.30	64.37	66.51	68.71
D/C Twin/Triple Conductor	₹ lakh/km	0.71	0.73	0.76	0.78	0.81
S/C Twin/Triple Conductor	₹ lakh/km	0.40	0.42	0.43	0.45	0.46

37. The O&M Expenses approved under Regulation 29(3) of the 2014 Tariff Regulations are as follows:

Details	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
15 Numbers of 400 kV Sub-station bays	904.50	934.50	965.55	997.65	1030.65
325 km D/C Twin/Triple Conductor transmission line	229.78	237.58	245.38	253.50	261.95
174 km S/C Bundle Conductor Twin/Triple Conductor transmission line	70.30	72.73	75.17	77.60	80.21
<b>Total</b>	<b>1204.57</b>	<b>1244.81</b>	<b>1286.09</b>	<b>1328.75</b>	<b>1372.81</b>

38. The details of O&M Expenses approved vide order dated 30.12.2015 in Petition No. 535/TT/2014, O&M Expenses claimed in the instant petition and true-up O&M Expenses allowed in the instant order in respect of the transmission asset are as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Approved vide order dated 30.12.2015 in Petition No. 535/TT/2014	1204.57	1244.81	1286.09	1328.75	1372.81
Claimed by the Petitioner in the instant petition	1204.57	1244.81	1286.09	1328.75	1372.81
Allowed after true-up in this order	1204.57	1244.81	1286.09	1328.75	1372.81





### **Interest on Working Capital (IWC)**

39. The Petitioner is entitled to IWC as per Regulation 28 of the 2014 Tariff Regulations. The components of the working capital and the Petitioner's entitlement to interest thereon are discussed as follows:

#### **(i) Receivables**

Receivables as a component of working capital will be equivalent to two months fixed cost. The Petitioner has claimed the receivables on the basis of 2 months annual transmission charges. In the tariff being allowed, receivables have been worked out on the basis of 2 months transmission charges.

#### **(ii) Maintenance spares**

Regulation 28 of the 2014 Tariff Regulations provides for maintenance spares @ 15% per annum of the O&M expenses. The value of maintenance spares has accordingly been worked out.

#### **(iii) O & M expenses**

Operation and maintenance expenses have been considered for one month as a component of working capital. The Petitioner has claimed O&M expenses for 1 month of the respective year as claimed in the petition. This has been considered in the working capital.

#### **(iv) Rate of interest on working capital**

As per Proviso 3 of Regulation 28 of the 2014 Tariff Regulation, SBI Base rate 10.00% as on 1.4.2014 plus 350 basis points.e. 13.50% has been considered for the asset as the rate of interest on working capital.

40. The tried-up IWC allowed in respect of the transmission asset for 2014-19 tariff period is as follows:

	(₹ in lakh)				
<b>Particulars</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
WC for O&M Expenses (O&M Expenses for One Month)	100.38	103.73	107.17	110.73	114.40
WC for Maintenance Spares (15% of O&M)	180.69	186.72	192.91	199.31	205.92
WC for Receivables (Equivalent to two months of annual transmission charges)	605.20	616.32	623.89	631.82	641.25



<b>Total Working Capital</b>	886.26	906.77	923.98	941.86	961.57
Rate of Interest (%)	13.50	13.50	13.50	13.50	13.50
<b>Interest of working capital</b>	<b>119.65</b>	<b>122.41</b>	<b>124.74</b>	<b>127.15</b>	<b>129.81</b>

41. The details of IWC approved vide order dated 30.12.2015 in Petition No. 535/TT/2014, IWC claimed in the instant petition and trued-up IWC allowed in the instant order in respect of the transmission asset is as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Approved vide order dated 30.12.2015 in Petition No. 535/TT/2014	119.53	121.93	124.21	126.56	129.00
Claimed by the Petitioner in the instant petition	119.02	121.76	124.31	126.79	129.45
Allowed after true-up in this order	119.65	122.41	124.74	127.15	129.81

#### **Approved Annual Fixed Charges for 2014-19 Tariff Period**

42. Accordingly, the annual fixed charges after truing-up in respect of the transmission asset for 2014-19 tariff period are as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	374.32	382.65	383.75	385.32	388.35
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	1932.64	1948.03	1948.75	1949.68	1956.52
O&M Expenses	1204.57	1244.81	1286.09	1328.75	1372.81
Interest on Working Capital	119.65	122.41	124.74	127.15	129.81
<b>Total</b>	<b>3631.17</b>	<b>3697.90</b>	<b>3743.33</b>	<b>3790.90</b>	<b>3847.50</b>

43. The details of annual transmission charges approved vide order dated 30.12.2015 in Petition No. 535/TT/2014, annual transmission charges claimed in the instant petition and trued-up annual transmission charges allowed in the instant order in respect of the transmission asset are as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed earlier in order 30.12.2015 in Petition No. 535/TT/2014	3625.99	3676.18	3719.74	3764.75	3811.25
Claimed by the Petitioner in the instant petition	3603.24	3668.75	3724.49	3774.99	3831.23
Allowed after true-up in this order	3631.17	3697.90	3743.33	3790.90	3847.50



### **Determination of Annual Fixed Charges for the 2019-24 Tariff Period**

44. The Petitioner has claimed the following transmission charges for the 2019-24 tariff period:

Particulars	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	374.01	458.27	609.89	834.55	986.34
Interest on Loan	0.00	9.71	26.12	40.05	22.82
Return on equity	1860.56	1874.23	1906.48	1949.70	1980.79
Interest on Working Capital	100.45	104.62	110.07	116.87	121.70
O & M Expenses	1533.94	1588.67	1644.33	1702.96	1760.81
<b>Total</b>	<b>3868.96</b>	<b>4035.50</b>	<b>4296.89</b>	<b>4644.13</b>	<b>4872.46</b>

45. The details of the IWC claimed by the Petitioner are as follows:

Particulars	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
O&M Expenses	127.83	132.39	137.03	141.91	146.73
Maintenance Spares	230.09	238.30	246.65	255.44	264.12
Receivables	475.69	497.53	529.75	572.56	599.07
<b>Total</b>	<b>833.61</b>	<b>868.22</b>	<b>913.43</b>	<b>969.91</b>	<b>1009.92</b>
Rate of Interest (%)	12.05	12.05	12.05	12.05	12.05
<b>Interest</b>	<b>100.45</b>	<b>104.62</b>	<b>110.07</b>	<b>116.87</b>	<b>121.70</b>

### **Capital Cost**

46. Regulation 19 of the 2019 Tariff Regulations provides as follows:

*“19 Capital Cost (1) The Capital cost of the generating station or the transmission system, as the case may be, as determined by the Commission after prudence check in accordance with these regulations shall form the basis for determination of tariff for existing and new projects.*

*(2) The Capital Cost of a new project shall include the following:*

*(a) The expenditure incurred or projected to be incurred up to the date of commercial operation of the project;*

*(b) Interest during construction and financing charges, on the loans (i) being equal to 70% of the funds deployed, in the event of the actual equity in excess of 30% of the funds deployed, by treating the excess equity as normative loan, or (ii) being equal to the actual amount of loan in the event of the actual equity less than 30% of the funds deployed;*

*(c) Any gain or loss on account of foreign exchange risk variation pertaining to the loan amount availed during the construction period;*

*(d) Interest during construction and incidental expenditure during construction as computed in accordance with these regulations;*

*(e) Capitalised initial spares subject to the ceiling rates in accordance with these regulations;*



- (f) Expenditure on account of additional capitalization and de-capitalisation determined in accordance with these regulations;
- (g) Adjustment of revenue due to sale of infirm power in excess of fuel cost prior to the date of commercial operation as specified under Regulation 7 of these regulations;
- (h) Adjustment of revenue earned by the transmission licensee by using the asset before the date of commercial operation;
- (i) Capital expenditure on account of ash disposal and utilization including handling and transportation facility;
- (j) Capital expenditure incurred towards railway infrastructure and its augmentation for transportation of coal up to the receiving end of the generating station but does not include the transportation cost and any other appurtenant cost paid to the railway;
- (k) Capital expenditure on account of biomass handling equipment and facilities, for co-firing;
- (l) Capital expenditure on account of emission control system necessary to meet the revised emission standards and sewage treatment plant;
- (m) Expenditure on account of fulfilment of any conditions for obtaining environment clearance for the project;
- (n) Expenditure on account of change in law and force majeure events; and
- (o) 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.

(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 ash disposal and utilization including handling and transportation facility;
- (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 up to 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.

(4) The capital cost in case of existing or new hydro generating station shall also include:

- (a) cost of approved rehabilitation and resettlement (R&R) plan of the project in conformity with National R&R Policy and R&R package as approved; and
- (b) cost of the developer's 10% contribution towards Rajiv Gandhi GrameenVidyutikaranYojana (RGGVY) and DeendayalUpadhyaya Gram JyotiYojana (DDUGJY) project in the affected area.



(5) *The following shall be excluded from the capital cost of the existing and new projects:*

(a) *The asset forming part of the project, but not in use, as declared in the tariff petition;*

(b) *De-capitalised Asset after the date of commercial operation on account of replacement or removal on account of obsolescence or shifting from one project to another project:*

*Provided that in case replacement of transmission asset is recommended by Regional Power Committee, such asset shall be decapitalised only after its redeployment;*

*Provided further that unless shifting of an asset from one project to another is of permanent nature, there shall be no de-capitalization of the concerned asset.*

(c) *In case of hydro generating stations, any expenditure incurred or committed to be incurred by a project developer for getting the project site allotted by the State Government by following a transparent process;*

(d) *Proportionate cost of land of the existing project which is being used for generating power from generating station based on renewable energy; and*

(e) *Any grant received from the Central or State Government or any statutory body or authority for the execution of the project which does not carry any liability of repayment. “*

47. The Petitioner has claimed capital cost of ₹20343.78 lakh for the transmission assets as on 31.3.2019. However, the Commission has worked out the capital cost of the transmission asset as on 31.3.2019 of ₹20276.01 lakh. Accordingly, the capital cost of ₹20276.01 lakh for the transmission assets has been considered as on 1.4.2019 for determination of tariff in accordance with Regulation 19 of the 2019 Tariff Regulations.

### **Additional Capital Expenditure (ACE) & Decapitalization (de-cap)**

48. Regulation 24 and Regulation 25 of the 2019 Tariff Regulations provide as under:

*“24. Additional Capitalisation within the original scope and upto the cut-off date*

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



- (a) Undischarged liabilities recognized to be payable at a future date;
- (b) Works deferred for execution;
- (c) Procurement of initial capital spares within the original scope of work, in accordance with the provisions of Regulation 23 of these regulations;
- (d) 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;
- (e) Change in law or compliance of any existing law; and
- (f) Force Majeure events:

*Provided that in case of any replacement of the assets, the additional capitalization shall be worked out after adjusting the gross fixed assets and cumulative depreciation of the assets replaced on account of de-capitalization.*

*(2) The generating company or the transmission licensee, as the case may be shall submit the details of works asset wise/work wise included in the original scope of work along with estimates of expenditure, liabilities recognized to be payable at a future date and the works deferred for execution.”*

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

*(1) The ACE 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 cutoff 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.”



49. The Petitioner has projected net ACE of ₹2849.94 lakh after adjusting for decapitalization during 2019-24 tariff period for the transmission asset under Regulation 25(2)(c) of the 2019 Tariff Regulations. The Petitioner has claimed the following capital cost as on 31.3.2024:

(₹ in lakh)

Particulars	Land	Building & Civil Works	Transmission Line	Sub-station	PLCC	Amount
Total Capital Cost as on 1.4.2019	267.99	947.58	11215.86	7850.66	61.69	20343.78
ACE in 2019-20	0.00	0.00	0.00	0.00	0.00	0.00
ACE in 2020-21	0.00	179.66	0.00	821.77	0.00	1001.43
ACE in 2021-22	0.00	318.95	0.00	759.10	0.00	1078.05
ACE in 2022-23	0.00	278.59	0.00	1093.22	0.00	1371.81
ACE in 2023-24	0.00	0.00	0.00	257.63	0.00	257.63
De-Capitalization in 2019-20	0.00	0.00	0.00	0.00	0.00	0.00
De-Capitalization in 2020-21	0.00	0.00	0.00	(309.62)	0.00	(309.62)
De-Capitalization in 2021-22	0.00	(91.06)	0.00	(160.29)	0.00	(251.35)
De-Capitalization in 2022-23	0.00	0.00	0.00	(298.01)	0.00	(298.01)
De-Capitalization in 2023-24	0.00	0.00	0.00	(17.64)	0.00	(17.64)
Total Capital Cost as on 31.3.2024	267.99	1633.72	11215.86	9996.82	61.69	23176.08

50. The Petitioner has submitted that the additional capitalization and de-capitalization to be incurred during 2019-24 block is on account of expenditure towards replacement of sub-station items such as CBs, Isolator, Air conditioning system, firefighting system and various type old/obsolete electromechanical relay etc. as detailed below.

**(a) Replacement of sub-station equipment**

The sub-station equipment proposed to be replaced were put into commercial operation during 1993 to 1996 and they completed useful life of 25 years during 2014-19. During various routine/alter tests critical conditions are observed and the equipment are giving operational problems and are threat to the reliability and security to the grid. The designs have undergone substantial



changes over the period and manufacturers have discontinued the product models. The suppliers are unable to replenish parts required for quick restoration and repairs are unviable. In view of absence of proper support from suppliers, due to obsolescence of design, the maintenance of these equipments is not possible anymore and this is a serious threat to the reliability and security of grid operation.

**(b) Replacement of Circuit Breaker**

CBs have completed 25 years of useful service. The installed CBs are pneumatic type and having issues with pneumatic system, operating mechanism and SF6 gas leakage from various joints. Frequent failure of auxiliary contact of CB has also been witnessed in many CBs. CBs have become obsolete. Neither timely support from OEM nor spares are available.

**(c) Replacement of Isolators**

Isolators (Manufacturer Minel and Hivlem) have completed 25 years of useful service and due to ageing, there is problem of frequent misalignment, jamming, improper closing/opening, over travel, sluggishness in operating mechanism, and hot spots. Many times local operation has become difficult. Further, these isolators have become obsolete. Neither timely support from OEM nor spares are available. Minel is non-existent as on date and Hivlem have stopped manufacturing these types of isolators.

**(d) Replacement Reactor & Circuit Breaker protection panel at Maithon Sub-station**

Most of the relays are of static type. Due to ageing, problem of mal-operation/non-operation occurs because of sticking up of contacts as coils of auxiliary relays have weakened. Cable, Wiring & Terminal Blocks inside both control &





protection panels and Equipment MBs have become brittle leading to DC leakages and other circuit failures.

**(e) Replacement of Air Conditioning system of Rourkela Sub-staion**

The existing centralized AC system is of water cooled type and stopped functioning due to problem in reciprocating type old model compressor system and water-cooling system. For smooth functioning of protection system, AC system needs to be replaced on priority basis.

**(f) Replacement of Various type old/obsolete electromechanical relay**

All these relays are of electromechanical type and obsolete and giving frequent problem. They are required to be retrofitted with numerical type relays with DR channel naming for proper fault analysis.

**(g) Replacement of Control and Power cable of Maithon S/S**

Due to ageing the power and control cables have become brittle and physical damage are also observed at many places leading to DC leakage and frequent DC earth fault. For proper operation of sub-station, replacement of interpole cables is required.

51. Further, buildings and other civil structures like overhead tanks etc. which have been constructed in the sub-stations have completed the useful life of 30 years in accordance with Schedule-II, Company Act 2013 Part-C (1b). The Petitioner has submitted that these buildings and civil structures have been constructed in 1987-88 and have been in service for more than 30 years and do not comply with the earthquake resistant provisions of latest IS codes. The Petitioner has submitted that it is mandatory for all Government owned buildings and structures to be seismic resistant (Clause 3.2.6.1 of National Disaster Management Authority Guidelines).



Some of these buildings and civil structures are in dilapidated and unsafe condition and need urgent reconstruction to avoid any damage/threat to human life or property. Accordingly, the Petitioner has proposed to demolish these dilapidated and unsafe buildings and structures and construct new buildings and structures during 2019-24 tariff period. Thus, ACE/de-capitalization proposed under the head building and civil structures corresponds to demolition of such old buildings and construction of new buildings & civil structures. The Petitioner has also submitted the following relevant provisions of authenticated documents which recommend for seismic retrofitting, demolishing and reconstruction.

- a) Note of Appendix I, page 135 of CERC tariff regulation 2019
- b) Schedule-II, Company Act 2013 Part-C-I (b)
- c) Clause 3.2.6.1 and Table 5 of National Disaster Management Guideline for Seismic retrofitting of Deficient Buildings and structures
- d) Clause 13.1.4 of National Building code 2016 Volume-II Part 7
- e) Clause 13.1.5.1 of National Building code 2016 Volume-II Part 7
- f) Clause 7.4 of National Building Code 2016 Volume I Part 0
- g) Clause 1.2.2 and 1.2.4 of National Disaster Management Guidelines for Seismic retrofitting of Deficient Buildings and structures
- h) Clause 4.5.1, 4.5.2, A 7.1 of IS 13935 : 2009 : Seismic Evaluation, Repair and Strengthening of Masonry buildings

52. BSPHCL has submitted that while the Petitioner is claiming ACE on account of replacement of equipment, it has not submitted any OEM (Original Equipment Manufacturer) Certificate regarding the alleged outdated equipment and has also failed to furnish documentary evidence regarding the equipment being obsolete, date of installation of CTs, line protection panel, transformer and reactor panel and



test reports in support of these equipment. BSPHCL has further submitted that the Petitioner has proposed to demolish dilapidated and unsafe buildings but has not furnished test reports in respect of healthiness of buildings and civil structures, approval from the competent authority and consent from beneficiaries.

53. In response, the Petitioner has submitted that the justification has already been submitted vide affidavit dated 3.3.2021 and the same may be considered.

54. The justification provided by the Petitioner vide affidavit dated 3.3.2021 is as follows:

*(a) Replacement of 400 kV “ABB” & “BHEL” make Circuit breakers at Maithon, Rourkela, Jamshedpur and Biharshariff Sub-stations*

In Rourkela, Jamshedpur and Biharshariff Sub-stations CBs supplied are of ABB (pneumatic type) and BHEL (Hydraulic type) make CBs are giving frequent maintenance problems leading to prolonged outages causing unstable grid operation. This may cause failure of CBs in service. The manufacturers have also stopped manufacturing said model of CBs. The spares and service support from the OEM has been poor and cost of spares are exorbitantly high and is also consuming time. Subsequently, OEM has stopped giving service support and ABB and BHEL had already intimated that these CBs are obsolete and hence cannot be supplied. Therefore, it is proposed to replace 4 set of ABB make and 13 sets of BHEL make CBs at Maithon (seven), Rourkela (one), Jamshedpur (seven) and Biharshariff (two) Sub-stations.

*(b) Replacement of 220 kV “CGL” make Pneumatic Circuit breakers at Maithon Sub-station*

The 220 kV CBs supplied at Maithon Sub-station are of CGL make pneumatic operated type and has become obsolete and OEM has stopped production of these types of CBs. The spares and service support from the OEM was poor for



this type of CBs and cost of spares are high and takes much longer time. Moreover, CBs are giving frequent maintenance problems leading to frequent breakdown, prolonged outages and unreliable operation. In this type of CBs where controlled switching device are installed, issue has also been observed in CSD tuning and performance due to large scattering variation in operating time of CBs resulting in adverse effect on associated shunt reactors. In view of this, it is proposed to replace 6 set of CGL make Pneumatic CBs at Mathon Sub-station.

*(c) Replacement of 400 kV "Minel", "S&S" and "Hivlem" make Isolators at Maithon Jamshedpur and Biharshariff Sub-stations*

The Isolators have completed 25 years of useful life. These isolators are mainly of Horizontal Centre Break (HCB) type and frequent problem of misalignment is being faced. The major spares are now no more available in most of the cases due to obsolete design of isolators and thus creating problem in matching the old isolators. Due to improper health of isolator, especially interlock mechanism, drive mechanism etc. are unable to maintain stable condition sometimes during storms and high wind conditions and getting opened in ON LOAD condition. Due to rusting, many MOM boxes got damaged leading to problem in components of MOM boxes and motorised operation of isolators are not possible. Due to age and wear tear, many times even local operation also becomes difficult. The timely support are not available from OEM due to old design existing spares have already been exhausted. Therefore, it is proposed to replace twenty isolators at Maithon, nineteen isolators at Jamshedpur and five Isolators at Biharshariff.

*(d) Replacement of 220 kV "S&S" and "Hivelem" make Isolators at Maithon Sub-station*



The Isolators proposed to be replaced are of S&S and Hivelem make and have completed 25 years of useful life. The frequent problem of misalignment is being faced leading to frequent breakdown are being experienced. Due to improper health of isolator specially interlock mechanism, drive mechanism etc are unable to maintain the stable condition sometimes during storms and high wind conditions and getting opened in ON LOAD condition. Due to rusting, many MOM boxes got damaged leading to problem in components of MOM boxws and motorised operation of isolators are not possible resulting difficulties in local operations. Therefore, it is proposed to replace 21 set of isolators at Maithon.

*(e) Replacement of old & obsolete static/ Electro mechanical type Protection relays at Maithon and Rourkela*

The Differential, REF/ Direction overcurrent cum earth fault/ Auto reclosure/ Master trip relays installed are of 25 years old Static/ Electro mechanical type. Due to ageing, the contacts of these relays have become sluggish and may cause problem in the equipment system. The relays are kept out of service to avoid mal-operation and the only option is replacement. Further, these relays possess following drawbacks:

1. Lack of self-diagnostics features
2. No Disturbance recording/ Event logging features
3. Not possible for remote monitoring/ remote accessing
4. Lack of time synchronization facility

Hence, detailed trip analysis is not possible in case of tripping. Therefore, the old & obsolete static/ Electro mechanical type Protection relays should be replaced with numerical relays at Maithon and Rourkela.



*(f) Replacement of Control and Power cable at Maithon*

The Control cable at Maithon are more than 25 years old. Due to climatic condition, large number of cables in the cable trenches have damaged over a period of time. Since an unhealthy cable in addition to being a source of DC Earth fault can also lead to mal-operation /spurious sig falling etc which are not desirable in a healthy power system. Further, Cable is also required during retrofitting of isolators & CTs to be carried out under add-cap during 2019-24. Therefore, it is proposed to replace inter-pole power and control cable for retrofitting of equipment and damaged cables in cable trends at Maithon

*(g) Replacement of Air conditioning system at Rourkela*

The Petitioner has submitted that the existing centralized air conditioning system is of Voltas make and water cooled type that has stopped functioning due to problem in reprocating type old model compressor system and water-cooling system. Due to ageing and problem in multiple subsystems breakdown time of air conditioning system has gone up. Air conditioning system being important for maintaining healthiness of control and protection system of the station, it is proposed to replace existing centralized air conditioning system at Rourkela.

*(h) Replacement of 50 MVAR, 400 kV Line Reactor of 400 kV Maithon-Kahalgaon Transmission Line 1, Maithon-Mejia Transmission Line 1 at Maithon Sub-station and Replacement of 50 MVAR, 400 kV Bus Reactor- II at Jamshedpur Sub-station*

The condition based monitoring/ maintenance of transformers/ reactors like DGA, Tan delta measurement of bushings & windings, oil parameters, Furan analysis, FDS IR of core insulation etc are being carried out by the Petitioner to know the healthiness. DGA test reports indicate high CO/ CO<sub>2</sub> ratio and high Furan confirming deterioration of paper insulation. The unit is very old and no



spare bushings and also no other spare parts are available. The Petitioner approached CPRI to analyse test results of said equipment and to know the condition of the equipment. The test results were analysed by CPRI (Third party) and based on the test results, CPRI has recommended to replace the said unit. Further, the availability of line reactor is very much required for keeping the line in service/ at the time of taking line into service. The reactor has already completed more than 25 years of useful service life and due to ageing chances of its failure is high. Therefore, it is proposed to replace the 50 MVA, 400 kV line reactor of 400 kV Maithon- Kahalgaon Line 1 at Maithon Sub-station.

55. We have considered the submissions of the Petitioner and BSPHCL. The details of ACE allowed/not allowed are given in the following paragraphs.

***Replacement of sub-station equipment***

56. The Petitioner has submitted that the Substation already completed more than 25 years of useful life and majority of the substation equipment need to be replaced. The proposed ACE towards replacement of CBs at Rourkela, Jamshedpur and Biharsharif Sub-stations, isolators at Maithon, Jamshedpur and Biharsharif Sub-stations, old/obsolete electromechanical relay at Maithon and Rourkela Sub-stations, control and power cables at Maithon Sub-station. These items are of critical nature and their failure may affect the stability and reliability of the grid.

57. It is observed that the Petitioner has not submitted the item wise break-up and cost of the equipment proposed to be replaced. Due to non- submission of item wise details and cost the individual cost of the equipment proposed to be replaced, we are not in a position to analyse the ACE claimed in 2019-24 tariff period and therefore we are not allowing the proposed ACE at this stage. However, the Petitioner



is granted liberty to file fresh petition for approval of ACE during 2019-24 period as sought in this petition with all the relevant details like abstract cost estimate of the proposed items.

### ***Replacement of Reactors***

58. The 50 MVAR line Reactor installed at Maithon substation and 50 MVAR Bus Reactor installed at Jamshedpur sub-station have also completed more than 25 years of useful life. The Petitioner has proposed replacement of 50 MVAR, 400 kV line reactor of 400 kV Maithon- Kahalgaon Line 1 at Maithon Sub-station, 50 MVAR, 400 kV line reactor of 400 kV Maithon- Mejia Line 1 at Maithon Sub-station and 50 MVAR, 400 kV Bus reactor-II at Jamshedpur Sub-station. The Commission is of the view that a detailed study need to be carried out about the requirement of Reactors (line Reactor/Bus Reactor) at these Substations in the changed scenario of increased Short circuit MVA levels and the same needs to be vetted by the CTU. Accordingly, the projected ACE towards replacement of 50 MVAR Reactors at Maithon and Jamshedpur sub-stations is not allowed at this stage. The Petitioner is directed to file fresh petition alongwith the report of the study duly vetted by CTU.

### ***Building and Civil Works***

59. It is observed that the the petitioner has also projected ACE towards buildings and civil structures which are more than 30 years old. The Petitioner has proposed to demolish these structures which it has claimed as become dilapidated and unsafe and construct new buildings and structures during the 2019-24 tariff period. As directed by the Commission in various orders regarding replacements of buildings and civil structures, the Petitioner may discuss the proposal for construction of buildings and civil structures in the RPC and only thereafter approach the Commission with a fresh petition.





60. Accordingly, capital cost of the transmission asset as on 31.3.2024 is approved as follows:

Capital Cost as on 1.4.2019	Approved Net ACE					Capital Cost as on 31.3.2024
	2019-20	2020-21	2021-22	2022-23	2023-24	
20276.01	0.00	0.00	0.00	0.00	0.00	20276.01

### **Debt-Equity Ratio**

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

**“18. Debt-Equity Ratio:** (1) For new projects, the debt: equity ratio of 70:30 as on date of commercial operation shall be considered. If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan:

Provided that:

- i. where equity actually deployed is less than 30% of the capital cost, actual equity shall be considered for determination of tariff:
- ii. the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment:
- iii. any grant obtained for the execution of the project shall not be considered as a part of capital structure for the purpose of debt: equity ratio.

**Explanation-**The premium, if any, raised by the generating company or the transmission licensee, as the case may be, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, only if such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station or the transmission system.

(2) The generating company or the transmission licensee, as the case may be, shall submit the resolution of the Board of the company or approval of the competent authority in other cases regarding infusion of funds from internal resources in support of the utilization made or proposed to be made to meet the capital expenditure of the generating station or the transmission system including communication system, as the case may be.

(3) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2019, debt: equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2019 shall be considered:

Provided that in case of a generating station or a transmission system including communication system which has completed its useful life as on or after 1.4.2019, if the equity actually deployed as on 1.4.2019 is more than 30% of the capital cost, equity in excess of 30% shall not be taken into account for tariff computation;



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

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

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

*(6) Any expenditure incurred for the emission control system during the tariff period as may be admitted by the Commission as additional capital expenditure for determination of supplementary tariff, shall be serviced in the manner specified in clause (1) of this Regulation.*

62. The debt-equity ratio for 2019-24 period is allowed as per Regulation 18(3) of the 2019 Tariff Regulations. The details of the debt-equity ratio considered for the purpose of tariff for 2019-24 tariff period is as follows:

<b>Funding</b>	<b>Capital cost as on 1.4.2019 (₹ in lakh)</b>	<b>(in %)</b>	<b>Total cost as on 31.3.2024 (₹ in lakh)</b>	<b>(in %)</b>
Debt	10369.67	51.14	10369.67	51.14
Equity	9906.34	48.86	9906.34	48.86
<b>Total</b>	<b>20276.01</b>	<b>100.00</b>	<b>20276.01</b>	<b>100.00</b>

### **Depreciation**

63. 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 asset 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 asset 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 asset 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 asset.*

*(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 up to 31.3.2019 from the gross depreciable value of the asset.*

*(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 asset 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.”

64. The depreciation has been worked out considering the admitted capital expenditure as on 31.3.2019 and accumulated depreciation up to 31.3.2019. The transmission project has already completed more than 12 years before 1.4.2019. Accordingly, depreciation has been calculated based on the remaining depreciable value (up to 90% of existing gross block of assets) to be recovered over the balance useful life. The depreciation allowed in respect of the transmission asset for the 2019-24 tariff period is as follows:

(₹ in lakh)						
	Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
A	Opening Gross Block	20276.01	20276.01	20276.01	20276.01	20276.01
B	Addition during the year 2019-24 due to projected ACE	0.00	0.00	0.00	0.00	0.00
C	Closing Gross Block (A+B)	20276.01	20276.01	20276.01	20276.01	20276.01
D	Average Gross Block [(A+C)/2]	20276.01	20276.01	20276.01	20276.01	20276.01
E	Average Gross Block (90% depreciable assets)	20026.99	20026.99	20026.99	20026.99	20026.99



F	Average Gross Block (100% depreciable assets)	0.00	0.00	0.00	0.00	0.00
G	Depreciable value (excluding IT equipment and software)(E*90%)	18024.29	18024.29	18024.29	18024.29	18024.29
H	Depreciable value of IT equipment and software	0.00	0.00	0.00	0.00	0.00
I	Total Depreciable Value (G+H)	18024.29	18024.29	18024.29	18024.29	18024.29
J	Rate of Depreciation (in %)	1.92	1.92	1.92	1.92	1.92
K	Elapsed useful life at the beginning of the year (Year)	25	26	27	28	29
L	Balance useful life at the beginning of the year (Year)	7	6	5	4	3
M	<b>Depreciation during the year(D*J)</b>	390.04	390.04	390.04	390.04	390.04
N	Aggregate Cumulative Depreciation at the end of the year	15684.05	16074.09	16464.13	16854.17	17244.21
O	Remaining Aggregate Depreciable Value at the end of the year(I-N)	2340.25	1950.20	1560.16	1170.12	780.08

### **Interest on Loan (“IoL”)**

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

**“32. Interest on loan capital:** (1) *The loans arrived at in the manner indicated in Regulation 18 of these regulations shall be considered as gross normative loan for calculation of interest on loan.*

(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 asset, 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 up to the date of de-capitalisation 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.*

*(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.*

*(5a) The rate of interest on loan for installation of emission control system shall be the weighted average rate of interest of actual loan portfolio of the emission control system or in the absence of actual loan portfolio, the weighted average rate of interest of the generating company 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 loans shall be reflected from the date of such re-financing”.*

66. BSPHCL has submitted that the 2019 Tariff Regulations do not permit the claim of floating rate of interest. In response, the Petitioner has reiterated its submissions from the main petition.

67. We have considered the submissions of BSPHCL and Petitioner. The weighted average rate of IoL has been considered on the basis of rate prevailing as on 1.4.2019. The Petitioner has prayed that the change in interest rate due to floating rate of interest applicable, if any, during 2019-24 tariff period will be adjusted. The floating rate of interest, if any, shall be considered at the time of true



up. Accordingly, IoL has been worked out in accordance with Regulation 32 of the 2019 Tariff Regulations IoL allowed is as follows:

		(₹ in lakh)				
	Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
A	Gross Normative Loan	10369.67	10369.67	10369.67	10369.67	10369.67
B	Cumulative Repayments up to Previous Year	10369.67	10369.67	10369.67	10369.67	10369.67
C	Net Loan-Opening (A-B)	0.00	0.00	0.00	0.00	0.00
D	Addition due to ACE	0.00	0.00	0.00	0.00	0.00
E	Repayment during the year	0.00	0.00	0.00	0.00	0.00
F	Net Loan-Closing(C+D-E)	0.00	0.00	0.00	0.00	0.00
G	Average Loan [(A+F)/2]	0.00	0.00	0.00	0.00	0.00
H	Weighted Average Rate of Interest on Loan (in %)	8.101	8.003	8.289	8.893	8.893
I	<b>Interest on Loan (GxH)</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### **Return on Equity (RoE)**

68. Regulations 30 and 31 of the 2019 Tariff Regulations specify as follows:

**“30. Return on Equity:** (1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with Regulation 18 of these regulations.

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

Provided that return on equity in respect of Additional Capitalization after cut-off date beyond the original scope excluding Additional Capitalization on account of emission control system, shall be computed at the weighted average rate of interest on actual loan portfolio of the generating station or the transmission system transmission system, the weighted average rate of interest of the generating company or the transmission licensee, as the case may be, as a whole shall be considered, subject to ceiling of 14%;  
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.

(3) The return on equity in respect of additional capitalization on account of emission control system shall be computed at the base rate of one year marginal cost of lending rate (MCLR) of the State Bank of India as on 1st April of the year in which the date of operation (ODE) occurs plus 350 basis point, subject to ceiling of 14%;

**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 follows:

$$\text{Rate of pre-tax return on equity} = \text{Base rate} / (1-t)$$

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

**Illustration-**

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

:

$$\text{Rate of return on equity} = 15.50 / (1-0.2155) = 19.758\%$$

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





- (a) Estimated Gross Income from generation or transmission business for FY 2019-20 is Rs 1,000 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 customers, as the case may be, on year to year basis.”

69. The Petitioner has submitted that MAT rate is applicable to the Petitioner's Company. We have considered the submissions of the Petitioner. Accordingly, the MAT rate applicable in 2019-20 has been considered for the purpose of RoE which shall be trued up with actual tax rate in accordance with Regulation 31(3) of the 2019 Tariff Regulations. The RoE allowed in respect of the transmission asset under Regulation 30 of the 2019 Tariff Regulations is as follows:

(₹ in lakh)						
	Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
A	Opening Equity	9906.34	9906.34	9906.34	9906.34	9906.34
B	Addition due to ACE	0.00	0.00	0.00	0.00	0.00
C	Closing Equity (A+B)	9906.34	9906.34	9906.34	9906.34	9906.34
D	Average Equity [(A+B)/2]	9906.34	9906.34	9906.34	9906.34	9906.34
E	Return on Equity (Base Rate) (in %)	15.500	15.500	15.500	15.500	15.500
F	Tax Rate applicable (in %)	17.472	17.472	17.472	17.472	17.472
G	Rate of Return on Equity (Pre-tax)	18.782	18.782	18.782	18.782	18.782
H	<b>Return on Equity (Pre-tax)</b>	<b>1860.61</b>	1860.61	1860.61	1860.61	1860.61

### **Operation & Maintenance Expenses (“O&M Expenses”)**

70. The O&M Expenses claimed by the Petitioner for the various elements included in the transmission asset for the 2019-24 tariff period are as follows:



(₹ in lakh)

Combined Asset					
Transmission lines					
Sr. No.	Name of Line	Single Circuit / Double Circuit	Number of Sub-Conductors	Line Length (Km)	
1	Twin Conductor D/C Kahalgaon-Maithon Transmission Line	Double Circuit	2	172	
2	Twin Conductor D/C Maithon –Jamshedpur Transmission Line	Double Circuit	2	153	
3	Twin Conductor S/C Jamshedpur –Rourkela Transmission Line	Single Circuit	2	174	
<b>Sr. No.</b>	<b>400 kV Substation bay</b>				
1	Maithon:Maithon-Kahalgaon-I				
2	Maithon:Maithon-Kahalgaon-II				
3	Maithon: Bus Reactor				
4	Maithon:Maithon-Jamshedpur-I				
5	Maithon: ICT I				
6	Maithon: ICT II				
7	Rourkela:ICT-II				
8	Jamshedpur: Bus Reactor-II				
9	Jamshedpur: ICT I				
10	Jamshedpur: Jamshedpur-Maithon				
11	Jamshedpur: Jamshedpur-Maithon				
12	Rourkela: Rourkela- Jamshedpur				
13	Jamshedpur: Jamshedpur- Rourkela				
14	Biharsharif:ICT-II				
15	Rourkela:ICT-I				
<b>Sr. No.</b>	<b>400 kV ICT</b>				
1	6 X 315 MVA 400 kV Sub-station ICT				
O&M Expenses					
	2019-20	2020-21	2021-22	2022-23	2023-24
<b>Sub-station</b>					
400 kV					
Number of bays	15	15	15	15	15
<b>Transmission lines</b>					
S/C Twin/Triple Conductor (km)	0.50	0.52	0.54	0.56	0.58
D/C Twin/Triple Conductor (km)	0.88	0.91	0.94	0.98	1.01
<b>Transformer</b>					
400 kV	0.36	0.37	0.38	0.40	0.41
<b>PLCC</b>					
Original project cost (₹ in lakh)	61.69	61.69	61.69	61.69	61.69
<b>Total O&amp;M Expense (₹ in lakh)</b>	<b>1533.95</b>	<b>1588.68</b>	<b>1644.33</b>	<b>1702.97</b>	<b>1760.82</b>



71. Regulation 35(3)(a) and Regulation 35(4) of the 2019 Tariff Regulations specifies the norms for O&M Expenses for the transmission system and the same is as follows:

**“(3) Transmission system:** (a) The following normative operation and maintenance expenses shall be admissible for the transmission system:

<b>Particulars</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
<b>Norms for sub-station Bays (₹ Lakh per bay)</b>					
765 kV	45.01	46.60	48.23	49.93	51.68
400 kV	32.15	33.28	34.45	35.66	36.91
220 kV	22.51	23.30	24.12	24.96	25.84
132 kV and below	16.08	16.64	17.23	17.83	18.46
<b>Norms for Transformers (₹ Lakh per MVA)</b>					
765 kV	0.491	0.508	0.526	0.545	0.564
400 kV	0.358	0.371	0.384	0.398	0.411
220 kV	0.245	0.254	0.263	0.272	0.282
132 kV and below	0.245	0.254	0.263	0.272	0.282
<b>Norms for AC and HVDC lines (₹ lakh per km)</b>					
Single Circuit (Bundled Conductor with six or more sub-conductors)	0.881	0.912	0.944	0.977	1.011
Single Circuit (Bundled conductor with four sub-conductors)	0.755	0.781	0.809	0.837	0.867
Single Circuit (Twin & Triple Conductor)	0.503	0.521	0.539	0.558	0.578
Single Circuit (Single Conductor)	0.252	0.260	0.270	0.279	0.289
Double Circuit (Bundled conductor with four or more sub-	1.322	1.368	1.416	1.466	1.517
Double Circuit (Twin & Triple Conductor)	0.881	0.912	0.944	0.977	1.011
Double Circuit (Single Conductor)	0.377	0.391	0.404	0.419	0.433
Multi Circuit (Bundled Conductor with four or more sub-conductor)	2.319	2.401	2.485	2.572	2.662
Multi Circuit (Twin & Triple Conductor)	1.544	1.598	1.654	1.713	1.773
<b>Norms for HVDC stations</b>					
HVDC Back-to-Back stations (Rs Lakh per 500 MW) (Except Gazuwaka BTB)	834	864	894	925	958
Gazuwaka HVDC Back-to-Back station (₹ Lakh per 500 MW)	1,666	1,725	1,785	1,848	1,913
500 kV Rihand-Dadri HVDC bipole scheme (Rs Lakh) (1500 MW)	2,252	2,331	2,413	2,498	2,586
±500 kV Talcher- Kolar HVDC bipole scheme (Rs Lakh) (2000 MW)	2,468	2,555	2,645	2,738	2,834



<i>±500 kV Bhiwadi-Balia HVDC bipole scheme (Rs Lakh) (2500 MW)</i>	1,696	1,756	1,817	1,881	1,947
<i>±800 kV, Bishwanath-Agra HVDC bipole scheme (Rs Lakh) (3000 MW)</i>	2,563	2,653	2,746	2,842	2,942

*Provided that the O&M expenses for the GIS bays shall be allowed as worked out by multiplying 0.70 of the O&M expenses of the normative O&M expenses for bays;*

*Provided further that:*

- i. the operation and maintenance expenses for new HVDC bi-pole schemes commissioned after 1.4.2019 for a particular year shall be allowed pro-rata on the basis of normative rate of operation and maintenance expenses of similar HVDC bi-pole scheme for the corresponding year of the tariff period;*
- ii. the O&M expenses norms for HVDC bi-pole line shall be considered as Double Circuit quad AC line;*
- iii. the O&M expenses of ±500 kV Mundra-Mohindergarh HVDC bipole scheme (2000 MW) shall be allowed as worked out by multiplying 0.80 of the normative O&M expenses for ±500 kV Talchar-Kolar HVDC bi-pole scheme (2000 MW);*
- iv. the O&M expenses of ±800 kV Champa-Kurukshetra HVDC bi-pole scheme (3000 MW) shall be on the basis of the normative O&M expenses for ±800 kV, Bishwanath-Agra HVDC bi-pole scheme;*
- v. the O&M expenses of ±800 kV, Alipurduar-Agra HVDC bi-pole scheme (3000 MW) shall be allowed as worked out by multiplying 0.80 of the normative O&M expenses for ±800 kV, Bishwanath-Agra HVDC bi-pole scheme; and*
- vi. the O&M expenses of Static Synchronous Compensator and Static Var Compensator shall be worked at 1.5% of original project cost as on commercial operation which shall be escalated at the rate of 3.51% to work out the O&M expenses during the tariff period. The O&M expenses of Static Synchronous Compensator and Static Var Compensator, if required, may be reviewed after three years.*

*(b) The total allowable operation and maintenance expenses for the transmission system shall be calculated by multiplying the number of sub-station bays, transformer capacity of the transformer (in MVA) and km of line length with the applicable norms for the operation and maintenance expenses per bay, per MVA and per km respectively.*

*(c) The Security Expenses and Capital Spares for transmission system shall be allowed separately after prudence check:*

*Provided that the transmission licensee shall submit the assessment of the security requirement and estimated security expenses, the details of year-wise actual capital spares consumed at the time of truing up with appropriate justification.*



**(4) Communication system:** The operation and maintenance expenses for the communication system shall be worked out at 2.0% of the original project cost related to such communication system. The transmission licensee shall submit the actual operation and maintenance expenses for truing up.”

72. We have considered the submissions of the Petitioner. The Petitioner has claimed O&M Expenses separately for PLCC under Regulation 35(4) of the 2019 Tariff Regulations @2% of its original project cost in the instant petition. The Petitioner has made similar claim in other petitions as well. Though PLCC is a communication system, it has been considered as part of the sub-station in the 2014 Tariff Regulations and the 2019 Tariff Regulations and the norms for sub-station have been specified accordingly. Accordingly, the Commission vide order dated 24.1.2021 in Petition No. 126/TT/2020 has already concluded that no separate O&M Expenses can be allowed for PLCC under Regulation 35(4) of the 2019 Tariff Regulations even though PLCC is a communication system. Therefore, the Petitioner’s claim for separate O&M Expenses for PLCC @2% is not allowed.

73. The O&M Expenses approved in respect of the transmission asset for 2019-24 tariff period are as follows:

	(₹ in lakh)				
Details	2019-20	2020-21	2021-22	2022-23	2023-24
15 Numbers of 400 kV Sub-station bays	482.25	499.20	516.75	534.90	553.65
1890 MVA of 400 kV Transformer	676.62	701.19	725.76	752.22	776.79
174 km S/C Single Conductor	87.52	90.65	93.79	97.09	100.57
325 km D/C Twin/Triple Conductor	286.33	296.40	306.80	317.53	328.58
<b>Total</b>	<b>1532.72</b>	<b>1587.44</b>	<b>1643.10</b>	<b>1701.74</b>	<b>1759.59</b>

**Interest on Working Capital (“IWC”)**

74. Regulations 34(1)(c), Regulation 34(3), Regulation 34(4) and Regulation 3(7) of the 2019 Tariff Regulations provide as follows:



**“34. Interest on Working Capital**

(1)...

(c) For Hydro Generating Station (including Pumped Storage Hydro Generating Station) and Transmission System:

- i. Receivables equivalent to 45 days of 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”

“(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 ...

(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;”

75. The Petitioner has submitted that it has computed IWC for the 2019-24 period considering the SBI Base Rate plus 350 basis points as on 1.4.2019. The Petitioner has considered the rate of interest on working capital as 12.05%. IWC is worked out in accordance with Regulation 34 of the 2019 Tariff Regulations. The Rate of Interest (RoI) on working capital considered is 12.05% (SBI 1 year MCLR applicable as on 1.4.2019 of 8.55% plus 350 basis points) for 2019-20, 11.25% (SBI 1 year MCLR applicable as on 1.4.2020 of 7.75% plus 350 basis points) for 2020-21, 10.50% (SBI 1 year MCLR applicable as on 1.4.2021 of 7.00% plus 350 basis points) for 2021-22 and 10.60% (SBI 1 year MCLR applicable as on 1.4.2022 of 7.10% plus 350 basis points) for 2022-24.



76. The components of the working capital and interest thereon allowed for the instant transmission for the 2019-24 tariff period are as follows:

(₹ in lakh)					
Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
WC for O&M Expenses (O&M Expenses for one Month)	127.73	132.29	136.92	141.81	146.63
WC for Maintenance Spares (15% of O&M)	229.91	238.12	246.46	255.26	263.94
WC for Receivables (Equivalent to 45 days of annual transmission charges)	477.54	485.05	491.37	498.99	504.99
<b>Total Working Capital</b>	<b>835.18</b>	<b>855.46</b>	<b>874.76</b>	<b>896.06</b>	<b>915.56</b>
Rate of Interest (%)	12.05	11.25	10.50	10.60	10.60
<b>Interest of working capital</b>	<b>100.64</b>	<b>96.24</b>	<b>91.85</b>	<b>94.98</b>	<b>97.05</b>

### **Annual Fixed Charges for 2019-24 Tariff Period**

77. The transmission charges allowed in respect of the transmission asset for 2019-24 period are as follows:

(₹ in lakh)					
Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	390.04	390.04	390.04	390.04	390.04
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	1860.61	1860.61	1860.61	1860.61	1860.61
O & M Expenses	1532.72	1587.44	1643.10	1701.74	1759.59
Int. on Working Capital	100.64	96.24	91.85	94.98	97.05
<b>Total</b>	<b>3884.01</b>	<b>3934.33</b>	<b>3985.60</b>	<b>4047.37</b>	<b>4107.29</b>

### **Filing Fee and Publication Expenses**

78. The Petitioner has sought reimbursement of fee paid by it for filing the petition and publication expenses.

79. 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.



### **Licence Fee & RLDC Fees and Charges**

80. The Petitioner has sought reimbursement of licence fee in accordance with Regulation 70(4) of the 2019 Tariff Regulations for the 2019-24 tariff period. The Petitioner has also sought reimbursement of RLDC fee and charges in accordance with Regulation 70(3) of the 2019 Tariff Regulations for the 2019-24 tariff period. The Petitioner shall be entitled to Licence Fee and RLDC Fees and Charges in terms of 2019 Tariff Regulations.

### **Goods and Services Tax**

81. The Petitioner has submitted that if GST is levied at any rate and at any point of time in future on charges of transmission of electricity, the same shall be borne and additionally paid by the Respondent(s) to the Petitioner and the same shall be charged and billed separately by the Petitioner. Further additional taxes, if any, paid by the Petitioner on account of demand from Government/Statutory authorities, may be allowed to be recovered from the beneficiaries.

82. BSPHCL by placing reliance on Commission order's dated 5.8.2020 in Petition No. 48/TT/2020 wherein the Commission has rejected such prayer with regard to GST holding it to be premature submitted that the Petitioner's claim of GST be rejected.

83. We have considered the submissions of the Petitioner and BSPHCL. Since GST is not levied on transmission service at present, we are of the view that Petitioner's prayer is premature.

### **Security Expenses**

84. The Petitioner has submitted that security expenses in respect of the transmission asset are not claimed in the instant petition and it would file a separate





petition for claiming the overall security expenses and the consequential IWC. The Petitioner has requested to consider the actual security expenses incurred during 2018-19 for claiming estimated security expenses for 2019-20 which shall be subject to true up at the end of the year based on the actuals. The Petitioner has submitted that similar petition for security expenses for 2020-21, 2021-22, 2022-23 and 2023-24 shall be filed on a yearly basis on the basis of the actual expenses of previous year subject to true up at the end of the year on actual expenses. The Petitioner has submitted that the difference, if any, between the estimated security expenses and actual security expenses as per the audited accounts may be allowed to be recovered from the beneficiaries on an yearly basis.

85. In response, BSPHCL has submitted that the Petitioner may claim the security expenses under Petition No. 260/MP/2020 and should not be allowed to claim the same separately in every petition.

86. We have considered the submissions of the Petitioner and BSPHCL. It is observed that the Petitioner has already filed Petition No. 260/MP/2020 claiming consolidated security expenses on projected basis for the 2019-24 tariff period on the basis of actual security expenses incurred in 2018-19. Therefore, security expenses will be dealt with in Petition No. 260/MP/2020 in accordance with the applicable provisions of the 2019 Tariff Regulations.

### **Capital Spares**

87. The Petitioner has sought reimbursement of capital spares at the end of tariff period. The Petitioner's claim, if any, shall be dealt with in accordance with the provisions of the 2019 Tariff Regulations.



## **Sharing of Transmission Charges**

88. With effect from 1.7.2011, sharing of transmission charges for inter-State transmission systems was governed by the 2010 Sharing Regulations and with effect from 1.11.2020 (after repeal of the 2010 Sharing Regulations), sharing of transmission charges is governed by the 2020 Sharing Regulations. Accordingly, the liabilities of DICs for arrears of transmission charges determined through this order shall be computed in accordance with the provisions of respective Tariff Regulations and Sharing Regulations and shall be recovered from the concerned DICs through Bills under Regulation 15(2)(b) of the 2020 Sharing Regulations. Billing, collection and disbursement of the transmission charges for subsequent period shall be recovered in terms of provisions of the 2020 Sharing Regulations as provided in Regulation 57 of the 2019 Tariff Regulations.

89. To summarise:

- a. The trued-up annual fixed charges allowed in respect of the transmission asset for 2014-19 tariff period are as follows:

	(₹ in lakh)				
<b>Particulars</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
Annual Fixed Charges	3631.17	3697.90	3743.33	3790.90	3847.50

- b. The Annual Fixed Charges allowed in respect of the transmission asset for 2019-24 tariff period in this order are as follows:

	(₹ in lakh)				
<b>Particulars</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Annual Fixed Charges	3884.01	3934.33	3985.60	4047.37	4107.29



90. This order disposes of Petition No. 733/TT/2020 in terms of the above discussions and findings.

**sd/-**  
**(P. K. Singh)**  
**Member**

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

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

