

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 448/TT/2020

Coram:

Shri P. K. Pujari, Chairperson

Shri I. S. Jha, Member

Shri Arun Goyal, Member

Shri P. K. Singh, Member

Date of Order: 20.12.2021

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 the 2001-04, 2004-09 and 2009-14 tariff periods, truing up of transmission tariff of the 2014-19 tariff period under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 and determination of transmission tariff of the 2019-24 tariff period under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 for 400 kV Jeypore-Talcher 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

Versus

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 B. Dash, PGCIL
Shri A. K. Verma, PGCIL
Shri V.P. Rastogi, PGCIL

For Respondents : None

ORDER

The instant petition has been filed by Power Grid Corporation of India Limited, a deemed transmission licensee, for revision of the transmission tariff of 2001-04, 2004-09 and 2009-14 periods; truing up of the 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 determination of transmission tariff for the period from 1.4.2019 to 31.3.2024 under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as “the 2019 Tariff Regulations”) for 400 kV Jeypore-Talcher Transmission System in Eastern Region (hereinafter referred to as “the transmission system”).

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

- “1) Approve the revised Transmission Tariff for 2001-04, 2004-09 block and transmission tariff for 2009-14 block for the assets covered under this petition, as per para 8 above.*
- 2) 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.*
- 3) Allow the capital cost including the additional capitalization/ DE-capitalization going to be incurred during 2019-24 period as claimed by petitioner*
- 4) (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.

- 5) 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.
- 6) 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.
- 7) 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 respondents.
- 8) 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.
- 9) Allow the petitioner to claim the capital spares at the end of tariff block as per actual.
- 10) 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”

3. **Backdrop of the case**

a) The implementation of the transmission system was undertaken by NHPC Limited as a part of strengthening the evacuation of power in Eastern Region, which was subsequently taken over by the Petitioner and the transmission system was approved by the Central Government vide letter dated 5.5.1992 at a cost of ₹12040.00 lakh, including IDC of ₹1720.00 lakh with the scope of work as follows:

- i. 400 kV Jeypore-Indravati S/C line; and
- ii. 400 kV Indravati-Rengali S/C line.



b) The date of commercial operation (COD) of the transmission system was 1.12.1990. Prior to 1.4.1992, the transmission charges for the afore-mentioned lines were billed by NHPC Limited and since 1.4.1992 by the Petitioner.

c) The transmission tariff for the period from 1.4.1995 to 31.3.1997 and from 1.4.1997 to 31.3.2001 was notified by the Ministry of Power (Government of India) vide notification dated 14.6.1996 and 4.12.1998 respectively.

d) Based on the terms and conditions of tariff contained in the Commission's Notification dated 26.3.2001, the transmission tariff of the transmission system for the period from 1.4.2001 to 31.3.2004 was allowed vide order dated 22.10.2003 in Petition No. 23/2002.

e) A Review Petition No. 100/2003 filed against order dated 22.10.2003 in Petition No. 23/2002 was dismissed (vide order dated 11.5.2004) at the admission stage itself. The facts and findings related thereto have not been reproduced herein for the sake of brevity of this order.

f) The transmission tariff of the transmission system for the period from 1.4.2004 to 31.3.2009 was allowed vide order dated 14.9.2005 in Petition No. 122/2004 which was revised vide order dated 31.3.2008 in Petition No. 122/2004 in the process of implementation of the judgment of the Appellate Tribunal for Electricity (APTEL) dated 16.5.2007 in Appeal No. 121/2005.

g) The transmission tariff of the transmission system for the period from 1.4.2009 to 31.3.2014 was allowed vide order dated 8.3.2011 in Petition No. 195/2010. The same was trued-up and tariff for the 2014-19 tariff period was allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014.

h) The entire scope of work is complete and is covered in the instant petition.

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



5. The Petitioner has served the petition on the Respondents and notice regarding filing of this petition has also 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 notices published in the newspapers by the Petitioner. None of the Respondents have filed their reply in the matter.

6. This order is issued considering the submissions made by the Petitioner in the petition vide affidavit dated 13.1.2020 and the Petitioner's affidavit dated 22.3.2021 filed in response to technical validation letter.

7. The hearing in this matter was held on 6.4.2021 through video conference and the order was reserved. Having heard the representatives of the Petitioner and after perusal of the materials on record, we proceed to dispose of the petition.

REVISION OF TRANSMISSION CHARGES ALLOWED FOR 2001-04, 2004-09 AND 2009-14 TARIFF PERIODS

8. It is observed that as per the submissions of the Petitioner, there is no impact of the APTEL judgments dated 22.1.2007 and 13.6.2007 in Petition No. 81/2005 and Petition No. 139/2006 respectively on the tariff already allowed by the Commission for the 2001-04, 2004-09 and 2009-14 tariff periods. However, the Petitioner has claimed tariff for 2001-04, 2004-09 and 2009-14 tariff periods in this petition and has also submitted the tariff forms. On scrutiny of the same, we note that the transmission tariff allowed by the Commission earlier and the tariff claimed by the Petitioner for the transmission system for the said periods in the instant petition are the same as shown in the following table. As there is no difference in the tariff earlier allowed and claimed in the instant period for the 2001-04, 2004-09 and 2009-14 tariff periods, we do not find any reason to go into the tariff claimed by the Petitioner for the above said periods.



(` in lakh)

Particulars	2001-02	2002-03	2003-04
Allowed vide order dated 22.10.2003 in Petition No. 23/2002	1855.81	1626.06	1655.76
Claimed in this petition	1855.81	1626.06	1655.76

(` in lakh)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Allowed vide order dated 31.3.2008 in Petition No. 122/2004	1471.37	1486.23	1501.95	1517.68	1534.87
Claimed in this petition	1471.37	1486.23	1501.95	1517.68	1534.86

(` in lakh)

Particulars	2009-10	2010-11	2011-12	2012-13	2013-14
Allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014	2010.61	2086.82	2124.48	2162.93	2217.74
Claimed in this petition	2010.61	2086.82	2124.48	2162.93	2217.74

9. In furtherance to the above, the submissions of the Petitioner with respect to the revision/ consequential revision in tariff (as mentioned in this petition) have not been considered in this order and, accordingly, the Commission's findings on the aspect of revision/ consequential revision in tariff on the basis of the APTEL judgments have not been mentioned and dealt for the sake of brevity.

TRUING UP OF ANNUAL FIXED CHARGES FOR THE 2014-19 TARIFF PERIOD

10. The details of the trued-up transmission charges claimed by the Petitioner in respect of the transmission system for the 2014-19 tariff period are as follows:

(₹ in lakh)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	256.97	256.97	256.97	256.96	285.03
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	1181.43	1186.84	1186.24	1186.24	1196.82
O&M Expenses	654.90	676.89	699.42	722.53	746.53
Interest on Working Capital	69.29	70.63	71.86	73.13	75.35
Total	2162.59	2191.33	2214.49	2238.86	2303.73



11. The details of the trued-up Interest on Working Capital (IWC) claimed by the Petitioner in respect of the transmission system for the 2014-19 tariff period are as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Working Capital for O&M Expenses	54.58	56.41	58.29	60.21	62.21
Working Capital for Maintenance Spares	98.24	101.53	104.91	108.38	111.98
Working Capital for Receivables	360.43	365.22	369.08	373.14	383.96
Total Working Capital	513.25	523.16	532.28	541.73	558.15
Rate of Interest (in %)	13.50	13.50	13.50	13.50	13.50
Interest on Working Capital	69.29	70.63	71.86	73.13	75.35

Capital Cost

12. The capital cost of the transmission system has been calculated in accordance with Regulation 9(3) of the 2014 Tariff Regulations.

13. The Commission vide order 25.1.2016 in Petition No. 538/TT/2014 had allowed capital cost of ₹12040.00 lakh as on 1.4.2014 and ₹12289.33 lakh as on 31.3.2019, including projected Additional Capital Expenditure (ACE) of ₹249.33 lakh during the 2014-19 period. Accordingly, the details of estimated capital cost of the transmission system as on 31.3.2019 is as follows:

Admitted Capital Cost as on 1.4.2014	ACE		Total Capital Cost as on 31.3.2019
	2015-16	2016-17	
12040.00	124.67	124.66	12289.33

14. The details of actual ACE during the 2014-19 period and actual capital cost as on 31.3.2019 as submitted and claimed (vide Auditor's Certificate dated 13.1.2020) by the Petitioner in this petition are as follows:

Capital Cost admitted (as on 1.4.2014)	ACE	Capital Cost claimed (as on 31.3.2019)
	2018-19	
12040.00	249.33	12289.33



Additional Capital Expenditure

15. The Petitioner has submitted that the actual ACE claimed of ₹249.33 lakh (during 2018-19) in this petition has already been allowed by the Commission vide order dated 25.1.2016 in Petition No. 538/TT/2014 during 2015-16 and 2016-17 and the same is covered under Regulation 14(3)(ix) of the 2014 Tariff Regulations.

16. We have considered the submissions of the Petitioner and note that the Commission vide order dated 25.1.2016 in Petition No. 538/TT/2014 had allowed ACE of ₹249.33 lakh during the 2014-19 tariff period towards tower strengthening of 400 kV Indravati-Rengali transmission line. Accordingly, actual ACE of ₹249.33 lakh towards tower strengthening of 400 kV Indravati-Rengali transmission line is allowed under Regulation 14(3)(ix) of the 2014 Tariff Regulations.

17. In view of the above, the details of the capital cost (along with ACE during the 2014-19 period) considered for the true up of tariff for the 2014-19 tariff period are as follows:

Capital Cost as on 1.4.2014	ACE	Capital Cost as on 31.3.2019
	2018-19	
12040.00	249.33	12289.33

Debt-Equity Ratio

18. 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 details of the debt-equity ratio as on 1.4.2014 and 31.3.2019 considering (ACE during the 2014-19 period) for the transmission system are as follows:

Debt-Equity for Capital Cost as on 1.4.2014

Particulars	Capital Cost as on 1.4.2014 (₹ in lakh)	(in %)	Capital Cost as on 31.3.2019 (₹ in lakh)	(in %)
Debt	6020.00	50.00	6194.53	50.41



Particulars	Capital Cost as on 1.4.2014 (₹ in lakh)	(in %)	Capital Cost as on 31.3.2019 (₹ in lakh)	(in %)
Equity	6020.00	50.00	6094.80	49.59
Total	12040.00	100.00	12289.33	100.00

Depreciation

19. 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 trued-up depreciation allowed during the 2014-19 period is as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Gross Block	12040.00	12040.00	12040.00	12040.00	12040.00
ACE	0.00	0.00	0.00	0.00	249.33
De-capitalization	0.00	0.00	0.00	0.00	0.00
Closing Gross Block	12040.00	12040.00	12040.00	12040.00	12289.33
Average Gross Block	12040.00	12040.00	12040.00	12040.00	12164.67
Freehold Land	19.36	19.36	19.36	19.36	19.36
Weighted Average Rate of Depreciation (WAROD) (in %)	2.13	2.13	2.13	2.13	2.34
Balance useful life of the asset (Year)	8	7	6	5	4
Elapsed Life of the asset (Year)	23	24	25	26	27
Depreciable Value	10818.58	10818.58	10818.58	10818.58	10930.77
Depreciation during the year	256.97	256.97	256.97	256.97	285.02
Cumulative depreciation at the end of the year	9019.80	9276.76	9533.73	9790.70	10075.72
Remaining Depreciable Value at the end of the year	1798.78	1541.81	1284.84	1027.87	855.05

20. The details of the depreciation allowed in respect of the transmission assets vide order dated 25.1.2016 in Petition No. 538/TT/2014, claimed by the Petitioner in the instant petition and trued up in the instant order is as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014	256.97	264.98	283.68	294.90	294.90
Claimed by the Petitioner in the instant petition	256.97	256.97	256.97	256.96	285.03



Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed after true-up in this order	256.97	256.97	256.97	256.97	285.02

Interest on Loan (IoL)

21. The Petitioner has not claimed any IoL and, hence, no IoL has been considered in this order.

Return on Equity (RoE)

22. The Petitioner has claimed RoE for the transmission system in terms of Regulation 24 and Regulation 25 of the 2014 Tariff Regulations. The Petitioner has submitted that it is liable to pay income tax at Minimum Alternate Tax (MAT) rates and has claimed the following effective tax rates for the 2014-19 tariff period:

Year	Claimed effective tax rate (in %)	Grossed up RoE (in %) [(Base Rate)/(1-t)]
2014-15	21.018	19.625
2015-16	21.382	19.715
2016-17	21.338	19.705
2017-18	21.337	19.705
2018-19	21.549	19.758

23. The Commission in order dated 27.4.2020 in Petition No. 274/TT/2019 had arrived at the effective tax rate for the Petitioner based on the notified MAT rates and the same is as follows:

Year	Notified MAT rates (in %) (inclusive of surcharge & cess)	Effective tax (in %)
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

24. MAT rates as allowed vide order dated 27.4.2020 in Petition No. 274/TT/2019 for the purpose of grossing up of rate of RoE for trueing up of the tariff of 2014-19 period, in terms of the provisions of the 2014 Tariff Regulations, are considered in the instant case which is as follows:



Year	Notified MAT rates (in %) (inclusive of surcharge & cess)	Base rate of RoE (in %)	Grossed-up RoE (%) [(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

25. The Petitioner has claimed RoE for the 2014-19 period after grossing up the RoE @15.50% with Effective Tax rates (based on MAT rates) of each year as per Regulation 25(3) of the 2014 Tariff Regulations. RoE is trued up on the basis of MAT rates applicable in the respective years and is allowed for the transmission system for the 2014-19 tariff period as follows:-

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Equity	6020.00	6020.00	6020.00	6020.00	6020.00
Additions	0.00	0.00	0.00	0.00	74.80
Closing Equity	6020.00	6020.00	6020.00	6020.00	6094.80
Average Equity	6020.00	6020.00	6020.00	6020.00	6057.40
Return on Equity (Base Rate) (in %)	15.500	15.500	15.500	15.500	15.500
MAT Rate for respective year (in %)	20.961	21.342	21.342	21.342	21.549
Rate of Return on Equity (in %)	19.610	19.705	19.705	19.705	19.758
Return on Equity	1180.52	1186.24	1186.24	1186.24	1196.82

26. RoE allowed in respect of the transmission system vide order dated 25.1.2016 in Petition No. 538/TT/2014, claimed by the Petitioner in the instant petition and trued-up in the instant order is as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014	1180.52	1184.19	1191.52	1195.19	1195.19
Claimed by the Petitioner in the instant petition	1181.43	1186.84	1186.24	1186.24	1196.82
Allowed after true-up in this order	1180.52	1186.24	1186.24	1186.24	1196.82



Operation & Maintenance Expenses (O&M Expenses)

27. The O&M Expenses claimed by the Petitioner in respect of elements covered under the transmission system in this petition are as follows:

(₹ in lakh)					
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
8 Numbers 400 kV Sub-station Bays (at Indravati, Jeypore and Rengali)					
As claimed by the Petitioner	482.40	498.40	514.96	532.08	549.68
356 kms Single Circuit (Twin Circuit) (Jeypore-Indravati transmission line)					
71 kms Single Circuit (Twin Circuit) (Indravati-Rengali transmission line)					
As claimed by the Petitioner	172.51	178.49	184.46	190.44	196.85
Total	654.90	676.89	699.42	722.53	746.53

28. The O&M Expenses specified for the elements covered under the transmission system in Regulation 29(3) of the 2014 Tariff Regulations are as follows:

Element	Norms for 2014-15	Norms for 2015-16	Norms for 2016-17	Norms for 2017-18	Norms for 2018-19
S/C (Twin/Triple Conductor)	₹0.404 lakh/km	₹0.418 lakh/km	₹0.432 lakh/km	₹0.446 lakh/km	₹0.461 lakh/km
400 kV Sub-station	₹60.30 lakh/bay	₹62.30 lakh/bay	₹64.37 lakh/bay	₹66.51 lakh/bay	₹68.71 lakh/bay

29. We have considered the submissions of the Petitioner. The O&M Expenses approved for the elements covered under the transmission system under Regulation 29(3) of the 2014 Tariff Regulations are as follows:

(₹ in lakh)					
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
8 Numbers 400 kV Bays	482.40	498.40	514.96	532.08	549.68
427 kms S/C (Twin/Triple Conductor)	172.51	178.49	184.46	190.44	196.85
Total	654.91	676.89	699.42	722.52	746.53

30. O&M Expenses in respect of the transmission system allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014, claimed by the Petitioner in the instant petition and true-up in the instant order are as follows:

(₹ in lakh)					
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014	654.91	676.89	699.42	722.52	746.53
Claimed by the Petitioner in the instant petition	654.90	676.89	699.42	722.53	746.53
Allowed after true-up in this order	654.91	676.89	699.42	722.52	746.53



Interest on Working Capital

31. IWC has been worked out as per the methodology provided in Regulation 28 of the 2014 Tariff Regulations and the trued-up IWC allowed for the transmission system for the 2014-19 tariff period is as follows:

	(₹ in lakh)				
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Working Capital for O&M Expenses (O&M Expenses for 1 month)	54.58	56.41	58.29	60.21	62.21
Working Capital for Maintenance Spares (15% of O&M Expenses)	98.24	101.53	104.91	108.38	111.98
Working Capital for Receivables (Equivalent to 2 months of annual fixed cost)	360.28	365.12	369.08	373.14	383.95
Total Working Capital	513.09	523.06	532.28	541.73	558.14
Rate of Interest (in %)	13.50	13.50	13.50	13.50	13.50
Interest on Working Capital	69.27	70.61	71.86	73.13	75.35

32. IWC in respect of the transmission system allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014, claimed by the Petitioner in the instant petition and trued-up in the instant order is as follows:

	(₹ in lakh)				
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014	69.27	70.75	72.59	74.21	75.54
Claimed by the Petitioner in the instant petition	69.29	70.63	71.86	73.13	75.35
Allowed after true-up in this order	69.27	70.61	71.86	73.13	75.35

Approved Annual Fixed Charges for the 2014-19 Tariff Period

33. The trued-up Annual Fixed Charges (AFC) for the transmission system for the 2014-19 tariff period are as follows:

	(₹ in lakh)				
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Depreciation	256.97	256.97	256.97	256.97	285.02
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	1180.52	1186.24	1186.24	1186.24	1196.82
O&M Expenses	654.91	676.89	699.42	722.52	746.53
Interest on Working Capital	69.27	70.61	71.86	73.13	75.35



Total	2161.67	2190.71	2214.49	2238.87	2303.72
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34. Accordingly, AFC in respect of the transmission system allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014, claimed by the Petitioner in the instant petition and trued-up in the instant order are as follows:

(₹ in lakh)					
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed vide order dated 25.1.2016 in Petition No. 538/TT/2014	2161.66	2196.81	2247.22	2286.83	2312.16
Claimed by the Petitioner in the instant petition	2162.59	2191.33	2214.49	2238.86	2303.73
Allowed after true-up in this order	2161.67	2190.71	2214.49	2238.87	2303.72

Determination of Annual Fixed Charges for 2019-24 Tariff Period

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

(₹ in lakh)					
Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	328.06	342.83	557.99	192.23	344.65
Interest on Loan	0.00	0.00	0.00	31.85	59.23
Return on Equity	1144.02	1143.20	1145.89	1169.22	1198.81
O&M Expenses	813.14	842.16	871.48	902.51	933.34
Interest on Working Capital	57.57	59.15	63.71	60.38	64.77
Total	2342.79	2387.34	2639.07	2356.19	2600.80

36. The Petitioner has claimed IWC for the transmission system for the 2019-24 tariff period as follows:

(₹ in lakh)					
Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
Working Capital for O&M Expenses	67.76	70.18	72.62	75.21	77.78
Working Capital for Maintenance Spares	121.97	126.32	130.72	135.38	140.00
Working Capital for Receivables	288.05	294.33	325.36	290.49	319.77
Total Working Capital	477.78	490.83	528.70	501.08	537.55
Rate of Interest (in %)	12.05	12.05	12.05	12.05	12.05
Interest on Working Capital	57.57	59.15	63.71	60.38	64.77

Capital Cost as on 1.4.2019

37. 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 assets 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 upto 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 Grameen Vidyutikaran Yojana (RGGVY) and Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) project in the affected area.

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

(a) The assets forming part of the project, but not in use, as declared in the tariff petition;
(b) De-capitalised Assets 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 assets.

(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.”

38. The Petitioner has claimed capital cost of ₹12289.33 lakh (including actual ACE of ₹249.33 lakh) as on 31.3.2019 for the transmission system and the same has been worked out in preceding paragraphs and is considered as the opening capital cost as on 1.4.2019 for determination of tariff in accordance with Regulation 19 of the 2019 Tariff Regulations.

Additional Capital Expenditure

39. Regulation 25 of the 2019 Tariff Regulations provides as follows:



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 cut-off date may be admitted by the Commission, subject to prudence check:

- (a) Liabilities to meet award of arbitration or for compliance of the directions or order of any statutory authority, or order or decree of any court of law;
- (b) Change in law or compliance of any existing law;
- (c) Deferred works relating to ash pond or ash handling system in the original scope of work;
- (d) Liability for works executed prior to the cut-off date;
- (e) Force Majeure events;
- (f) Liability for works admitted by the Commission after the cut-off date to the extent of discharge of such liabilities by actual payments; and 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.”

40. Based on the Auditor's Certificate dated 13.1.2020, the details of estimated ACE/ de-capitalisation during the 2019-24 tariff period for the transmission system as submitted and claimed (under Regulation 25(2)(c) of the 2019 Tariff Regulations) by the Petitioner in this petition are as follows:

Particulars	(₹ in lakh) Amount
ACE in 2019-20	14.15
ACE in 2020-21	45.44
ACE in 2021-22	326.11
ACE in 2022-23	1489.57
ACE in 2023-24	321.65
De-Capitalisation in 2019-20	(23.60)
De-Capitalisation in 2020-21	(29.50)
De-Capitalisation in 2021-22	(136.17)
De-Capitalisation in 2022-23	(456.39)



41. The Petitioner has submitted that ACE and de-capitalisation during the 2019-24 tariff period is on account of expenditure towards Supply, Installation and commissioning of various sub-stations and replacement of old and obsolete equipment. Further, the details pertaining to estimated ACE/ de-capitalisation during the 2019-24 tariff period as submitted by the Petitioner in this petition are as follows:

a) Replacement of sub-station equipment

- i. The sub-station equipment proposed for replacement at sub-stations under the transmission system were commissioned in 1990 and their useful life of 25 years was completed in 2016. The equipment were in use since their commissioning. During various routine/ alter tests, critical conditions have been 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 hence repairs turned out to be unviable. In view of absence of proper support from suppliers and due to obsolescence of design, the maintenance of these equipment is not possible anymore and this is a serious threat to the reliability and security of grid operation.
- ii. All relays are of electromechanical type and obsolete, giving frequent problem which needs to be retrofitted numerical type relays with DR (Data Recorder) channel naming for proper fault analysis. Further, CTs, CVT and LA are required to be replaced as they are completing 25 years of useful life. Due to ageing, frequent oil leakages and hot spots are being routinely observed, these CVTs have secondary voltages drifts. Repair from manufacturer is either not available or techno-economically not beneficial. There are increased instances of failure/ operational parameter violation in similar type of CVTs in recent past. In case of LA, THRC values are deteriorating and may fail any time, also old LAs are of lower energy



capability (8 kJ/kV compare to present 10 kJ/kV) and hence for healthy operation of the transmission system, LA are required to be replaced.

- iii. DG set has already completed 25 years of service and hence issue is being faced during operation due to ageing of rotating parts. DG set plays a vital role in case of emergency i.e. power failure for proper operation of control and protection. Further, there is lot of problem is faced regularly to keep Fire fighting system in auto mode due to frequent problems with control panels, jockey pump, valves and compressor. Accordingly, the jockey pumps, associated valves, diesel engine etc. need to be replaced.

b) Replacement of Rengali ICT-II

- i. The said ICT is approximately 32 years old. The test parameter of the equipment is indicating high moisture content in the winding, which is detrimental to the life of the equipment. The matter was further referred to CPRI, Bangalore and the observations based on the analysis of the diagnostic test data are as follows:
 - Estimated moisture content in the solid insulation in 2.7% exceeding the maximum permissible range. Oil conductivity obtained from FDS data is also high;
 - The oil test results show low BDV and high water content in oil; and
 - Review of maintenance and equipment history indicates the autotransformer has undergone major overhauling including replacement of all gaskets to address the perennial oil leakage issues.
- ii. As the condition of the auto transformer is critical and considering the age of the equipment and for high system reliability, CPRI recommendation for the unit's replacement has been submitted.

c) Replacement of Jeypore ICT-I Unit-II

- i. The said ICT is approximately 32 years old. The core insulation resistance between core clamp and ground is zero indicating inadvertent core grounding. DGA results are showing the increasing trend in Hydrogen (H₂) gas concentration indicating low energy partial discharge. The filtration of the ICT was carried out in 2014 and 2018 due to high H₂ gas concentration. The H₂ gas started to increase after filtration. The matter was referred to the



CPRI, Bangalore and the observations based on the analysis of the diagnostic test data are as follows:

- Core insulation resistance value obtained between CC and G is 0 MΩ indicating inadvertent core grounding;
 - DGA results indicates increasing trend in H₂ gas concentration. This may be attributed to low energy partial discharge; and
 - Review of maintenance and equipment history indicates repeated H₂ violation in 2014 and 2018. Review of voltage and load profile shows that autotransformer is experiencing maximum overloading 150% of its rated capacity.
- ii. As the condition of the equipment is critical in view of increasing trend in the H₂ gas indicating low energy partial discharge, inadvertent core grounding and voltage and load profile data, CPRI recommendation for the unit's replacement has been submitted.

d) 400 kV S/C Jeypore-Indravati line

The said line is going to complete 34 years of life by 2024, due to ageing rusting of legs observed at many locations, which needs to be attended by providing some additional member and anti-rust paint. Further, many defective insulator strings have been identified by PID which needs to be replaced to avoid unwanted tripping of line. Existing spike earthing is to be strengthened as higher value is observed at many locations.

42. The Petitioner vide affidavit dated 22.3.2021 has made the following submissions with respect to ACE during 2019-24:

- a) Problematic equipment like CT, CVT, CB, Isolators, DG set, Fire fighting equipment, electro-magnetic LBB relay, Transformer etc. are proposed for replacement to ensure system reliability. In addition to equipment like CT, CVT, CB, Isolators, Transformers, Reactors, C&R panels etc. there are many other equipment/ materials like earthing system, tower and gantry structures, cables, which play a very important role in operation of any sub-station. As a whole it is very difficult to assess the life of the complete project. The equipment are replaced based on condition monitoring, however balance of the system still remains under service, for which replacement may be required in near future.



- b) The gross block of old equipment, being proposed to be replaced in the instant petition is hardly 5.38% of the total gross block of the project. However, other equipment of the project remains the same as commissioned with original project. As only some of the equipment are proposed to be replaced, it is difficult to determine the life extension of entire project including old equipment. The new equipment can definitely run for more than five years but considering the combination of equipment, in which majority of items are old and may require replacement in future, which cannot be assessed at this stage.
- c) No ACE has been proposed under building and civil heads in this petition.
- d) Details of ACE works approved in other petitions are as follows:
- Order dated 23.2.2016 in Petition No. 25/TT/2015 (Replacement of equipment under Salal-I Project at an approved cost of ₹390.00 lakh);
 - Order dated 28.1.2016 in Petition No. 133/TT/2015 (Replacement of equipment and refurbishment of HVDC Rihand-Dadri under Rihand TS project at an approved cost of ₹54800.00 lakh);
 - Order dated 20.9.2016 In Petition No. 543/TT/2014 (Replacement of equipment and refurbishment of HVDC Vindhyachal under Vindhyachal HVDC project at an approved cost of ₹35900.00 lakh); and
 - Order dated 9.2.2016 in Petition No. 35/TT/2015 (Replacement of equipment under CTP Augmentation Project at an approved cost of ₹6356.00 lakh).
- e) None of the Respondents have raised any objections with regard to the replacement and the decision on replacement of equipment is taken keeping in view the reliability of the system and based on difficulties being faced during maintenance. The proposal for replacement of equipment has been made only when it is felt essential and it becomes difficult to operate the system without replacement.

43. The Petitioner vide affidavit dated 22.3.2021 has further submitted the following justifications regarding ACE during the 2019-24 tariff period:

a) Retrofitting of ACDB at Jeypore, Indravati and Rengali Sub-stations

- i. ACDB system proposed for replacement is of English electric make and is more than 25 years old. Present ACDB system does not have main lighting distribution board (MLDB) and Emergency lighting distribution board (ELDB). For better reliability of the system MLDB and ELDBs are required for isolation of lighting load and other station load as lighting loads are more prone to unbalance and earth faults. This is as per CEA guidelines for sub-



- station which has also been incorporated in the latest specification of the Petitioner.
- ii. Therefore, retrofitting ACDB system along with MLDB and ELDB at Jeypore, Indravati and Rengali Sub-stations has been proposed.
- b) Replacement of old and obsolete static/ Electro mechanical type Protection relays at Jeypore, Indravati and Rengali:**
- i. LBB relay/ 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. In case of any failures, the relays are to be kept out of service to avoid mal-operation and the only option is replacement. These relays possess drawbacks as follows:
- Lack of self-diagnostics features;
 - No Disturbance recording/ Event logging features;
 - Not possible for remote monitoring /remote accessing;
 - Lack of time synchronization facility.
- ii. Hence, detailed trip analysis is not possible in case of tripping. Obsolescence letter from OEM (GE, Earlier English Electric) has been submitted. Therefore, old and obsolete static/ Electro mechanical type Protection relays to be replaced with numerical type relays which support IEC61850 communication protocol at Jeypore, Indravati and Rengali.
- c) Replacement of 400 kV and 220 kV “BHEL” make dead tank type Porcelain CTs at Jeypore, Indravati and Rengali**
- i. The proposed CT’s are more than 25 years old and of old “BHEL” make dead tank type with Porcelain peccicoat. Further, tan delta violation have been frequently noticed in these CTs due to ageing. Also oil leakages from various portions such as Turret gasket portion, Primary terminals etc have been noticed in many of these CT’s. Due to leakage in CTs, there may be moisture ingress resulting into failure of the CTs. CTs are hermetically sealed type and repairing of the same is not possible at site. After 25 years of operation repairing of the CTs at manufacturer works is also not techno economically viable. Moreover manufacturer also stopped manufacturing and repair works of these types of CTs.



- ii. Therefore, replacement of 10 numbers 400 kV and 10 numbers 220 kV CTs at Jeypore (220 kV: 4 numbers), Indravati (400 kV: 4 numbers) and Rengali (220 kV: 6 numbers, 400 kV: 6 numbers) Sub-stations has been proposed.

d) Replacement of 400 kV and 220 kV CVTs at Jeypore, Indravati and Rengali Sub-station

- i. CVT's proposed for replacement are of more than 25 years old which are used for protection and metering purpose. Due to aging capacitance value of CVT is also drifted causing change in secondary voltage. These may result into improper energy meter reading and mal-operation of protection system. Oil leakages from EMU tanks have been observed in these CVT's. Hence these CVT's are prone for failure at any time causing outage of the critically loaded feeders. CVTs are hermetically sealed type and repairing of the same is not possible at site. After 25 years of operation, repairing of CVTs at manufacturer works is also not techno economically viable. Moreover, manufacturer has also stopped manufacturing and repair works of these types of CVTs.
- ii. Therefore, replacement of 7 numbers, 400 kV and 6 numbers 220 kV CVTs at Jeypore (220 kV: 2 numbers, 400 kV: 1 number), Indravati (400 kV: 2 numbers) and Rengali (220 kV: 4 numbers, 400 kV: 4 numbers) Sub-stations has been proposed.

e) Replacement of 48 V Battery bank-I at Jeypore Sub-station

- i. Existing 48 V battery banks are old and giving frequent operational issues. Subsequently there has been addition of bays at Jeypore Sub-station. The capacity of battery has been degraded and same is running with low capacity. 48 V battery is used for PLCC system which plays a vital role for the protection system. Due to low capacity of battery, protection system will always be at risk. For proper working of PLCC system, healthiness of 48 V battery system is required.
- ii. Therefore, it is proposed to replace 48 V Battery bank at Jeypore Sub-station.

f) Insulator replacement, rectification of rusted legs, strengthening of earthing etc. in 400 kV Jeypore-Indravati line



- i. 400 kV Jeypore-Indravati line is commissioned in 1990 and has already completed 30 years of service. Over the years the pollution level has increased resulting in frequent failures of porcelain insulators. Defective insulators have been detected in multiple towers during PID testing. Presently polymer insulators are being provided in new lines to overcome these incidences. Some of the leg members got rusted over the time, which may become critical if not attended in time. The life of transmission line will increase significantly if corroded leg members of lines be replaced/ rectified properly.
- ii. Earthing of transmission line has also been found damaged or decomposed at many locations. Earthing of the tower plays a major role during lightning and improper earthing of the tower may result into back flash over the insulator causing not only outage of the line, but also failure of the insulators. To overcome these incidences of unwanted tripping due to improper earthings, additional earthings are provided in transmission line.
- iii. Therefore, replacement of porcelain insulators with Polymer insulators, rectification of rusted/ corroded leg members and provision of additional earthings in 400 kV Jeypore-Indravati line has been proposed.

g) Replacement of WSI make 336 kV and 245 kV Surge arrestors at Indravati Sub-station

- i. 336 kV rated surge arrestors installed at Indravati Sub-station are WSI make and are more than 25 years old. Due to ageing, the performance of LAs has started deteriorating. THRC of LAs are showing increasing trend. LA plays a vital role in protecting the equipment against lightning/ switching impulses. Non-functioning of LAs may cause damage to Transformer/ Reactor.
- ii. Therefore, replacement of 4 numbers 336 kV LA at Indravati and 2 numbers 245 kV LA at Rengali Sub-station has been proposed.

h) Replacement of 250 kVA DG set at Indravati Sub-station

- i. Presently 2 numbers 350 kVA Caterpillar make DG set is in service at Indravati Sub-station. There is no dedicated LT feeder available at Indravati Sub-station. Availability of LT supply provided by SEB is poor. Frequent problem of supply failure and under voltage is being faced in SEB supply



- throughout the year. DG sets plays major role in maintaining auxiliary supply of the station. During rainy season, auxiliary supply of station totally depends on DG set. The average running hour of DG set is 3 hours per day.
- ii. Due to ageing frequent problem has been observed in DG set like exciter problem, oil leakage, deterioration of winding, overheating etc. Heavy noise is also coming from DG set. As per Gazette notification 33004/99 regarding noise level of DG, due to indoor installation and without acoustic enclosures these DG sets are noisy in nature and are not complying with latest pollution norms and Gazette notification.
 - iii. DG set is being overheated within an hour, due to which DG set automatically stops and fails to restart. Being obsolete model, spare parts are not available. Service support for these types of DG set is poor and not cost effective.
 - iv. Therefore, replacement of one DG set at Indravati Sub-station with the present standards approved by Pollution Control Board has been proposed.
- i) Replacement of Fire fighting system at Indravati and Rengali Sub-station**
- i. The pipe Lines in the existing fire-fighting systems were laid underground and due to ageing, the anti-rusting coat on the pipes has worn out due to which the pipes have started to rust causing frequent and perennial leakages in the pipe lines. Identification and rectification of these leakages is tedious and time consuming process due to which the fire fighting system has been kept out of service for prolonged period taking the risk on the ICT/Reactor fire protection. Further the pumps, Motors, Deluge Valves, Sluice valves etc. have got rusted due to ageing and not operating properly at times as they have completed their useful life of 25 years. Since this equipment are very old, the design has become obsolete and there is no spare support from the respective OEMs due to obsolete technology. It is important to keep the fire-fighting system in the sub-station operational all the times to avoid any eventuality.
 - ii. Therefore, replacement of the existing old fire protection system at Indravati and Rengali Sub-station has been proposed.



j) Replacement of 220 KV “CGL” make Pneumatically operated circuit breakers at Rengali

- i. CBs supplied at Rengali are of pneumatic operated type. This type of Pneumatic technology has become obsolete and OEM has stopped production of these types of circuit breakers. The spares and service support from OEM is poor and cost of spares are exorbitantly high and is also consuming huge time. CBs are giving frequent maintenance problems such as Pneumatic drive failures, air leakages from the various parts of the mechanisms, SF6 gas leakages etc. leading to prolonged outages causing unstable grid operation. Where controlled switching device is installed, issue has also been observed for CSD tuning due to large variation in operating time of CBs resulting in adverse effect on associated Transformer/ reactor.
- ii. In view of the above, replacement of 1 number CGL make Pneumatic CB at Rengali Sub-station has been proposed.

k) Replacement of 11/0.433 kV, 630 kVA, 3-ph Aux. Transformers at Rengali

- i. As per the CEA grid connectivity guidelines 2007, redundant auxiliary supply to be made available. LT supply from DISCOM and supply from tertiary of installed ICT is available at Rengali. Presently, 11/0.433 kV, 630 kVA Auxiliary transformer (installed in 1989) meant for DISCOM supply is defective, due to which presently LT supply from DISCOM is not available for Rengali Sub-station. Gaskets of the LT transformer have been damaged and is beyond repair. IR value of the transformer is 820 k Ω which is below permissible limit.
- ii. As per CEA grid connectivity guidelines replacement of the defective 11/0.433 kV, 630 kVA LT transformer at Rengali is required to get more reliable auxiliary supply.

l) Replacement of 400 kV 1ph BHEL make 105 MVA ICT-I at Jeypore Sub-station

- i. Year of Manufacturing: 1987 (32 Years old): Condition based monitoring/ maintenance of transformers/ reactors like DGA, Tan delta measurement of bushings and windings, oil parameters, Furan analysis, FDS, IR of core insulation etc. are being carried out to know the healthiness. From the test



results of the said equipment, it was observed that there was increasing trend in H₂ (high rate of rise). Core insulation resistance value obtained between CC & G is 0 MΩ indicating inadvertent core grounding. The unit is very old and no spare bushings and other spare parts are available.

- ii. CPRI was approached to analyze the test results of said equipment and to know the condition of the equipment. The test results were analyzed by CPRI and based on the test results, CPRI has recommended to replace the said unit. Said ICT has already completed more than 25 years of useful service life and due to ageing chances of its failure is always high. In case of failure of transformer, the load at Jeypore cannot be met completely.
- iii. Therefore, replacement of 400 kV 1ph BHEL make 105 MVA ICT-I at Jeypore Sub-station has been proposed.

m) Replacement of 400 kV 3 ph BHEL make 315 MVA ICT-II at Rengali Sub-station

- i. (Year of Manufacturing: 1987 (32 Years old): Condition based monitoring/ maintenance of transformers/ reactors like DGA, Tan delta measurement of bushings and windings, oil parameters, Furan analysis, FDS, IR of core insulation etc. are being carried out to know the healthiness. ICT is having history of high water content. FDS result also confirms presence of high moisture content in solid insulation. The unit is old and no spare bushings and other spare parts are available.
- ii. CPRI was approached to analyze the test results of said equipment and to know the condition of the equipment. The test results were analyzed by CPRI and based on the test results, CPRI has recommended to replace the said unit. Said ICT has already completed more than 25 years of useful service life and due to ageing chances of its failure is always high. In case of failure of transformer, the load at Rengali cannot be met completely.
- iii. In view of the above, replacement of 400 kV 3ph BHEL make 315 MVA ICT-II at Rengali Sub-station has been proposed.

44. We have considered the submissions of the Petitioner and observe that the Petitioner has proposed ACE at the fag end of the useful life of the transmission system and has proposed five years extension of life for the transmission system. The



Petitioner has neither submitted the consent of beneficiaries/ Respondents nor has placed any material(s) on record to show that the projected ACE has the consent of beneficiaries/ Respondents. The proposed ACE is towards replacement of isolators, CTs, CVTs, DG set, Fire fighting system, ICTs, surge arrestors, control and relay panels, CB, insulator replacement, rectification of rusted legs and strengthening of earthing etc. due to obsolescence of technology. These items are of critical nature and their failure may affect the stability and reliability of the grid. As such, the replacement of these equipment and consequential ACE is approved, subject to true-up on actual basis. We direct the Petitioner to submit the details of abstract cost estimates and the actual cost of the replaced equipment sub-station wise at the time of truing up.

45. Further, the Petitioner has also proposed to replace 105 MVA ICT-1 at Jeypore and 315 MVA ICT-II at Rengali sub-stations and has claimed ACE of ₹460.90 lakh and ₹1147.35 lakh during 2022-23 and 2023-24 respectively. We observe that these ICTs are major elements of the transmission system which are critical and high value elements. So, we are of the view that if such items are to be replaced, it is prudent to discuss in RPC and the concerned beneficiaries. Accordingly, the projected ACE towards ICT is not allowed at this stage and the Petitioner is directed to seek approval from RPC for the said proposed replacements and file a separate petition for ACE towards “ICTs and Reactors” for consideration by the Commission.

46. In view of the above, the details of ACE and de-capitalisation allowed with respect to the transmission system during the 2019-24 tariff period are as follows:

Particulars	(₹ in lakh)						
	Land	Building and Civil Works	Transmission Line	Sub-station	PLCC/ Communication System	IT Equipment including Software	Total
Total Capital Cost as on 1.4.2019	91.76	694.07	5820.80	5290.64	142.73	0.00	12040.00
ACE in 2019-20				14.15			14.15
ACE in 2020-21				45.44			45.44



ACE in 2021-22			27.12	298.99			326.11
ACE in 2022-23			18.08	184.88			202.96
De-Capitalisation in 2019-20				-23.60			-23.60
De-Capitalisation in 2020-21				-29.50			-29.50
De-Capitalisation in 2021-22				-136.17			-136.17
Total Capital Cost as on 31.3.2024	91.76	694.07	5866.00	5644.83	142.73	0.00	12439.39

47. Therefore, the detailed breakup of net ACE allowed is as follows:

(₹ in lakh)

Particulars	Transmission Line	Sub-station
De-Capitalisation during 2019-20	0.00	(23.60)
ACE in 2019-20	0.00	14.15
De-Capitalisation during 2020-21	0.00	(29.50)
ACE in 2020-21	0.00	45.44
De-Capitalisation during 2021-22	0.00	(136.17)
ACE in 2021-22	27.12	298.99
ACE in 2022-23	18.08	184.88

48. Accordingly, the summarized ACE and de-capitalisation allowed for the 2019-24 tariff period is as follows:

(₹ in lakh)

Particulars		2019-20	2020-21	2021-22	2022-23	2023-24
ACE	A	14.15	45.44	326.11	202.96	0.00
De-capitalisation	B	23.60	29.50	136.17	0.00	0.00
Net ACE	C=A-B	(9.45)	15.94	189.94	202.96	0.00

Adjustment in Equity

49. The transmission system was put under commercial operation on 1.12.1990 and the debt-equity ratio as on COD was 50:50. The Weighted Average Life for the transmission system was determined as 31 years and, therefore, the transmission system shall complete its useful life on 30.11.2021. First proviso to Regulation 18(3) of the 2019 Tariff Regulations provides that in case of a transmission system including communication system which has completed its useful life on or after 1.4.2019 and if the actual equity actually deployed as on 1.4.2019 is more than 30% of the capital cost, then the equity shall be restricted to 30% of the total equity deployed. Regulation 18(3) of the 2019 Tariff Regulations provides as follows:

“18. Debt-Equity Ratio: (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;.....”

50. The debt-equity ratio as on 31.3.2019 is 50.41:49.59 i.e. the equity deployed is more than 30%. Therefore, as per proviso to Regulation 18(3) of the 2019 Tariff Regulations, equity from 1.12.2021 onwards has been restricted to 30%. Accordingly, the capital cost for the 2019-24 tariff period is allowed as follows:

Particulars	(₹ in lakh) Amount
Closing equity as on 31.3.2020*	6087.24
Closing equity as on 31.3.2021**	6086.13
Closing equity as on 30.11.2021***	6000.16
Equity in excess of 30% (b)	2370.15
Equity admissible as on 1.12.2021**** (a)-(b)	3630.02

* Represents 49.57% of Gross Block of ₹12279.88 lakh

** Represents 49.50% of Gross Block of ₹12295.82 lakh

*** Represents 49.59% of Gross Block of ₹12100.06 lakh

**** Represents 30% of Gross Block of ₹12100.06 lakh

Debt-Equity ratio

51. 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.”

52. The details of the debt-equity considered for the purpose of computation of tariff for the 2019-24 tariff period are as follows:

Debt-Equity for Gross Capital Cost as on 1.4.2019

Particulars	Capital Cost as on 1.4.2019 (A) (₹ in lakh)	
	₹ in lakh	(in %)
Debt	6194.53	50.41
Equity	6094.80	49.59
Total	12289.33	100.00

Debt-Equity for ACE and de-capitalisation during the 2019-24 period

Particulars	ACE (B)		De-capitalisation (C)		ACE (D)		De-capitalisation (E)		ACE (F)		De-capitalisation (G)	
	2019-20	(in %)	2019-20	(in %)	2020-21	(in %)	2020-21	(in %)	2021-22	(in %)	2021-22	(in %)
Debt	9.91	70.00	11.80	50.00	31.81	70.00	14.75	50.00	228.28	70.00	68.09	50.00
Equity	4.25	30.00	11.80	50.00	13.63	30.00	14.75	50.00	97.83	30.00	68.09	50.00
Total	14.15	100.00	23.60	100.00	45.44	100.00	29.50	100.00	326.11	100.00	136.17	100.00

Particulars	ACE (H)
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	2022-23	(in %)
Debt	142.07	70.00
Equity	60.89	30.00
Total	202.96	100.00

Debt-Equity for Gross Capital Cost as on 31.3.2024

Particulars	Capital cost as on 31.3.2024 (I)= A+B-C+D-E+F-G+H	(₹ in lakh)
Debt		6511.96
Equity		6176.76**
Total		12688.72

** Equity to be serviced as on 31.3.2024 is ₹3806.62 lakh (₹6176.76 lakh - ₹2370.15 lakh i.e. Equity in excess of 30% reduced as discussed above)

Depreciation

53. Regulations 33(1), 33(2) and 33(5) of the 2019 Tariff Regulations provide 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 there of 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"

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

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

54. The transmission system has already completed more than 12 years before 1.4.2019. Accordingly, depreciation has been calculated based on the remaining



depreciable value (upto 90% of existing gross block of assets) to be recovered over the balance useful life upto 31.3.2022 and with effect from 1.4.2022, no depreciation is allowed on the transmission system. The depreciation has been worked out considering the admitted capital expenditure as on 31.3.2019 and accumulated depreciation up to 31.3.2019. However, depreciation for ACE (new additions) allowed during fag end of the transmission system is allowed at normative rate of depreciation as specified in the 2019 Tariff Regulations. Depreciation allowed for the transmission system for the 2019-24 tariff period is as follows:

(₹ in lakh)

Existing Assets	2019-20	2020-21	2021-22
Opening Gross Block	12289.33	12265.73	12236.23
ACE	0.00	0.00	0.00
De-capitalisation	23.60	29.50	136.17
Closing Gross Block	12265.73	12236.23	12100.06
Average Gross Block	12277.53	12250.98	12168.15
Freehold Land	19.36	19.36	19.36
Weighted average rate of Depreciation (WAROD) (in %)	2.60	2.55	2.08
Depreciable Value	11032.35	11008.46	10872.63
Cumulative Depreciation at the beginning	10075.72	10373.36	10664.36
Less: Dep adjustment on a/c of decapitalisation	21.24	26.55	122.55
Net Cumulative Depreciation after adjustment for de-capitalisation	10373.36	10664.36	10872.63
Balance useful life of the Asset (Year)	3	2	1
Elapsed life (Year)	28	29	30
Depreciation	318.88	317.55	330.82

(₹ in lakh)

New Additions	2019-20	2020-21	2021-22	2022-23	2023-24
Opening Gross Block	0.00	14.15	59.59	385.70	588.66
ACE	14.15	45.44	326.11	202.96	0
Closing Gross Block	14.15	59.59	385.70	588.66	588.66
Average Gross Block	7.08	36.87	222.65	487.18	588.66
Freehold Land	0.00	0	0	0	0
Weighted average rate of Depreciation (WAROD) (in %)	5.28	5.28	5.28	5.28	5.28
Depreciable Value (Excluding Freehold Land)	6.37	33.18	200.38	438.46	529.79
Cumulative Depreciation at the beginning of the year	0.00	0.37	2.32	14.08	39.80
Depreciation	0.37	1.95	11.76	25.72	31.08
Cumulative Depreciation at the end	0.37	2.32	14.08	39.80	70.88



New Additions	2019-20	2020-21	2021-22	2022-23	2023-24
of the year					
Remaining Depreciation recoverable at the end of the year	5.99	30.86	186.30	398.66	458.91

Interest on Loan

55. 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 assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalisation of such asset.*

(4) *Notwithstanding any moratorium period availed by the generating company or the transmission licensee, as the case may be, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the depreciation allowed for the year or part of the year.*

(5) *The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio after providing appropriate accounting adjustment for interest capitalized:*

Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered;

Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.

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

(7) *The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing.”*

56. Gross normative loan has already been repaid prior to 1.4.2019 and therefore, IoL has been considered on ACE (new additions). WAROI on loan has been considered on the basis of rate prevailing as on 1.4.2019. The Petitioner has prayed that change in interest rate due to floating rate of interest applicable, if any, during



2019-24 tariff period be adjusted. Accordingly, the floating rate of interest, if any, shall be considered at the time of truing up. Therefore, IoL has been allowed in accordance with Regulation 32 of the 2019 Tariff Regulations which is as follows:

Particulars	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Gross Normative Loan	6194.53	6192.64	6209.69	6369.89	6511.96
Cumulative Repayments up to Previous Year	6194.53	6183.10	6170.30	6113.26	6137.07
Net Loan-Opening	0.00	9.53	39.39	256.63	374.89
Additions	9.91	31.81	228.28	142.07	0.00
De-capitalisation	11.80	14.75	68.09	0.00	0.00
Repayment during the year	0.37	1.95	11.76	25.72	31.08
Adjustment of Cumulative Repayment Pertaining to decapitalized asset	11.80	14.75	68.09	0.00	0.00
Net Loan-Closing	9.53	39.39	256.63	374.89	346.19
Average Loan	4.77	24.46	147.65	314.09	356.72
Weighted Average Rate of Interest on Loan (in %)	7.4900	7.4900	7.4900	7.4900	7.4900
Interest on Loan	0.36	1.83	11.06	23.53	26.72

Return on Equity

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

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

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

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

Provided further that:

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



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

iii. in case of a thermal generating station, with effect from 1.4.2020:

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

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

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

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

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

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

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

Illustration-

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

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

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

(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.”

58. The Petitioner has submitted that it is liable to pay Income Tax at MAT rate prescribed under the Taxation laws (Amendment) Ordinance 2019. Further, RoE has been calculated @18.782% after grossing up the RoE with MAT rate of 17.472% (Base Rate 15% + Surcharge 12% + Cess 4%) based on the formula given in Regulation 31(2) of the 2019 Tariff Regulations for the 2019-24 tariff period. As per Regulation 31(3) of the 2019 Tariff Regulations, the grossed-up rate of RoE at the end of every financial year shall be trued up 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 IT authorities pertaining to the 2019-24 tariff period on actual gross income. However, if any penalty 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 RoE after truing up shall be recovered or refunded to beneficiaries or the long term customers on yearly basis. The Petitioner has further submitted that any adjustment due to additional tax demand including interest duly adjusted for any refund of tax including interest received from IT authorities shall be recoverable/adjustable during the 2019-24 tariff period on yearly basis on receipt of Income Tax assessment order.

59. We have considered the submissions of the Petitioner. As observed above, equity with effect from 1.12.2021 onwards has been restricted to 30% as per first



proviso to Regulation 18(3) of the 2019 Tariff Regulations. Accordingly, 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. RoE allowed for the transmission system for the 2019-24 tariff period is as follows:

Existing Assets	(₹ in lakh)					
	2019-20	2020-21	2021-22 (1.4.2021 - 30.11.2021) (244 Days)	2022-23 (1.12.2021- 31.3.2022) (121 Days)	2022-23	2023-24
Opening Equity	6094.80	6083.00	6068.25	6000.16	3630.02	3630.02
Adjustment of equity	0.00	0.00	0.00	2370.15*	0.00	0.00
Net Opening Capital	6094.80	6083.00	6068.25	3630.02	3630.02	3630.02
Additions	0.00	0.00	0.00	0.00	0.00	0.00
De-capitalization	11.80	14.75	68.09	0.00	0.00	0.00
Closing Equity	6083.00	6068.25	6000.16	3630.02	3630.02	3630.02
Average Equity	6088.90	6075.62	6034.21	4815.09	3630.02	3630.02
Return on Equity (Base Rate) (in %)	15.500	15.500	15.500	15.500	15.500	15.500
MAT Rate for respective year (in %)	17.472	17.472	17.472	17.472	17.472	17.472
Rate of Return on Equity (in%)	18.782	18.782	18.782	18.782	18.782	18.782
Return on Equity	1143.62	1141.12	755.56	301.46	681.79	681.79

*Equity in excess of 30% removed

New Additions	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Opening Equity	0.00	4.25	17.88	115.71	176.60
Adjustment of equity		0.00	0.00	0.00	0.00
Net Opening Capital	0.00	4.25	17.88	115.71	176.60
Additions	4.25	13.63	97.83	60.89	-
De-capitalization	-	-	-	-	0.00
Closing Equity	4.25	17.88	115.71	176.60	176.60
Average Equity	2.12	11.06	66.79	146.15	176.60
Return on Equity (Base Rate) (in %)	15.500	15.500	15.500	15.500	15.500
MAT Rate for respective year (in %)	17.472	17.472	17.472	17.472	17.472
Rate of Return on Equity (in %)	18.782	18.782	18.782	18.782	18.782
Return on Equity	0.40	2.08	12.55	27.45	33.17

Operation & Maintenance Expenses

60. The O&M Expenses claimed by the Petitioner in respect of the elements covered under the transmission system for the 2019-24 tariff period are as follows:

Particulars	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
8 Numbers 400 kV Sub-station Bays (at Indravati, Jeypore and Rengali)					
Claimed by the Petitioner	257.20	266.24	275.60	285.28	295.28
3 Numbers 400 kV Sub-station ICT (Jeypore and Rengali)					
Claimed by the Petitioner	338.31	350.60	362.88	376.11	388.40
356 kms Single Circuit (Twin Circuit) (Indravati-Rengali)					



Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
71 kms Single Circuit (Twin Circuit) (Indravati-Rengali)					
Claimed by the Petitioner	214.78	222.47	230.15	238.27	246.81
PLCC (2% of ₹142.73 lakh)	2.85	2.85	2.85	2.85	2.85
Total	813.14	842.16	871.48	902.51	933.34

61. Regulations 35(3)(a) and 35(4) of the 2019 Tariff Regulations provide as follows:

“35. Operation and Maintenance Expenses (3) Transmission system: (a) The following normative operation and maintenance expenses shall be admissible for the transmission system:

Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
Norms for sub-station Bays (₹ Lakh per bay)					
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
Norms for Transformers (₹ Lakh per MVA)					
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
Norms for AC and HVDC lines (₹ Lakh per km)					
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-conductors)	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
Norms for HVDC stations					



<i>HVDC Back-to-Back stations (Rs Lakh per 500 MW) (Except Gazuwaka BTB)</i>	834	864	894	925	958
<i>Gazuwaka HVDC Back-to-Back station (₹ Lakh per 500 MW)</i>	1,666	1,725	1,785	1,848	1,913
<i>500 kV Rihand-Dadri HVDC bipole scheme (Rs Lakh) (1500 MW)</i>	2,252	2,331	2,413	2,498	2,586
<i>±500 kV Talcher- Kolar HVDC bipole scheme (Rs Lakh) (2000 MW)</i>	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 year*

(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.”

“35(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.”

62. We have considered the submission of the Petitioner. The Petitioner has claimed O&M Expenses separately for PLCC under Regulation 35(4) of the 2019 Tariff Regulation @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 has 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.

63. O&M Expenses in respect of the various elements covered under the transmission system have been worked out as per the norms specified in the 2019 Tariff Regulations as follows:

Particulars	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
8 Numbers 400 kV Sub-station Bays (at Indravati, Jeypore and Rengali)					
Norms (₹ lakh/Bay)	32.15	33.28	34.45	35.66	36.91
Total	257.20	266.24	275.60	285.28	295.28
3 Numbers 400 kV Sub-station ICT (Jeypore and Rengali)					
Norms (₹ lakh/MVA)	0.358	0.371	0.384	0.398	0.411



Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
Total	338.31	350.60	362.88	376.11	388.40
356 kms Single Circuit (Twin Circuit) (Indravati-Rengali)					
71 kms Single Circuit (Twin Circuit) (Jeypore-Indravati)					
Norms (₹ lakh/km)	0.503	0.521	0.539	0.558	0.578
Total	214.78	222.47	230.15	238.27	246.81
Total O&M Expenses allowed (₹ in lakh)	810.29	839.30	868.63	899.66	930.48

Interest on Working Capital

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

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

.....

(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 1st April of the year during the tariff period 2019-24 in which the generating station or a unit thereof or the transmission system including communication system or element thereof, as the case may be, is declared under commercial operation, whichever is later:

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

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

“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;”

65. 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 IWC as 12.05%. IWC is worked out in accordance with



Regulation 34 of the 2019 Tariff Regulations. The Rate of Interest 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 the year 2020-21 and from 2021-22 onwards has been considered as 10.50% (SBI 1 year MCLR applicable as on 1.4.2021 of 7.00% plus 350 basis points). Therefore, IWC is worked out in accordance with Regulation 34 of the 2019 Tariff Regulations and the components of the working capital and interest allowed thereon is as follows:

Particulars	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Working Capital for O&M Expenses (O&M Expenses for 1 month)	67.52	69.94	72.39	74.97	77.54
Working Capital for Maintenance Spares (15% of O&M Expenses)	121.54	125.90	130.29	134.95	139.57
Working Capital for Receivables (Equivalent to 45 days of annual transmission charges)	286.63	290.78	288.92	209.86	214.99
Total Working Capital	475.70	486.62	491.60	419.78	432.11
Rate of Interest (in %)	12.05	11.25	10.50	10.50	10.50
Interest on Working Capital	57.32	54.74	51.62	44.08	45.37

Annual Fixed Charges of the 2019-24 Tariff Period

66. The transmission charges allowed for the transmission system for the 2019-24 tariff period are as follows:

Particulars	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Depreciation	319.25	319.50	342.58	25.72	31.08
Interest on Loan	0.36	1.83	11.06	23.53	26.72
Return on Equity	1144.02	1143.20	1069.57	709.24	714.96
O&M Expenses	810.29	839.30	868.63	899.66	930.48
Interest on Working Capital	57.32	54.74	51.62	44.08	45.37
Total	2331.24	2358.58	2343.45	1702.22	1748.61

Filing Fee and Publication Expenses

67. The Petitioner has sought reimbursement of fee paid by it for filing the Petition and publication expenses. The Petitioner shall be entitled for reimbursement of the



filing fees and publication expenses in connection with the present Petition, directly from the beneficiaries on pro-rata basis in accordance with Regulation 70(1) of the 2019 Tariff Regulations.

Licence Fee & RLDC Fees and Charges

68. The Petitioner shall be entitled for reimbursement of licence fee in accordance with Regulation 70(4) of the 2019 Tariff Regulations for the 2019-24 tariff period. The Petitioner shall also be entitled for recovery of RLDC fee and charges in accordance with Regulation 70(3) of the 2019 Tariff Regulations for the 2019-24 tariff period.

Goods and Services Tax

69. 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, are to be paid by the Petitioner on account of demand from Government/ Statutory authorities, the same may be allowed to be recovered from the beneficiaries.

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

Security Expenses

71. The Petitioner has submitted that security expenses for the transmission system are not claimed in the instant petition and it would file a separate petition for claiming the overall security expenses and the consequential IWC.

72. We have considered the submissions of the Petitioner. The Petitioner has claimed consolidated security expenses on projected basis for the 2019-24 tariff period on the basis of actual security expenses incurred in 2018-19 in Petition No.



260/MP/2020. The said petition has already been disposed of by the Commission vide order dated 3.8.2021 wherein the Commission had approved security expenses from 1.4.2019 to 31.3.2024. Therefore, security expenses will be shared in terms of the order dated 3.8.2021 in Petition No. 260/MP/2020. Therefore, the Petitioner's prayer in the instant petition for allowing it to file a separate petition for claiming the overall security expenses and consequential IWC has become infructuous.

Capital Spares

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

Sharing of Transmission Charges

74. During the 2001-04, 2004-09 and 2009-14 tariff periods (up to 30.6.2011), the transmission charges for inter-State transmission systems were being shared in accordance with the Tariff Regulations for the respective tariff periods. 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 DIC-wise 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.



75. To summarise:

- a) The trued-up AFC allowed for the transmission system for 2014-19 tariff period are as follows:

(₹ in lakh)				
2014-15	2015-16	2016-17	2017-18	2018-19
2161.67	2190.71	2214.49	2238.87	2303.72

- b) AFC allowed for the transmission system for 2019-24 tariff period in this order are as follows:

(₹ in lakh)				
2019-20	2020-21	2021-22	2022-23	2023-24
2331.24	2358.58	2343.45	1702.22	1748.61



76. This order disposes of Petition No. 448/TT/2020 in terms of the above discussions and findings.

sd/-
(P. K. Singh)
Member

sd/-
(Arun Goyal)
Member

sd/-
(I. S. Jha)
Member

sd/-
(P. K. Pujari)
Chairperson

