

# CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 317/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: 03.02.2022**

**In the matter of:**

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

**And in the matter of:**

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

.....Petitioner

**Versus**

1. Madhya Pradesh Power Management Company Limited,  
Shakti Bhawan, Rampur,  
Jabalpur – 482008.
2. Madhya Pradesh Power Transmission Company Limited,  
Shakti Bhawan, Rampur,  
Jabalpur – 482008.
3. Madhya Pradesh Audyogik Kendra Vikas Nigam (Indore) Limited,  
3/ 54, Press Complex,  
Agra-Bombay Road,  
Indore – 452008.



4. Maharashtra State Electricity Distribution Co. Limited,  
Hongkong Bank Building, 3<sup>rd</sup> Floor,  
M.G. Road, Fort,  
Mumbai – 400001.
5. Maharashtra State Electricity Transmission Co. Limited,  
Prakashganga, 6th Floor, Plot No. C-19, E-Block,  
Bandra Kurla Complex, Bandra (East),  
Mumbai – 400051.
6. Gujarat Urja Vikas Nigam Limited,  
Sardar Patel Vidyut Bhawan,  
Race Course Road,  
Vadodara – 390007.
7. Gujarat Energy Transmission Corporation Limited,  
Sardar Patel Vidyut Bhawan,  
Race Course Road,  
Vadodara –390007.
8. Electricity Department, Government of Goa,  
Vidyut Bhawan, Near Mandvi Hotel,  
Panaji, Goa – 403001.
9. Electricity Department,  
Administration of Daman & Diu,  
Daman – 396210.
10. Electricity Department,  
Administration of Dadra Nagar Haveli,  
U.T., Silvassa – 396230.
11. Chhattisgarh State Electricity Board,  
P. O. Sunder Nagar, Dangania,  
Raipur, Chhattisgarh – 492013.
12. Chhattisgarh State Power Transmission Co. Limited,  
Office of the Executive Director (C&P),  
State Load Despatch Building, Dangania,  
Raipur – 492013.
13. Chhattisgarh State Power Distribution Co. Limited,  
P. O. Sunder Nagar, Dangania,  
Raipur, Chhattisgarh – 492013.

.....Respondent(s)



**For Petitioner:** Shri S.S. Raju, PGCIL  
Shri D.K. Biswal, PGCIL  
Shri V.P. Rastogi, PGCIL  
Shri A.K. Verma, PGCIL

**For Respondent:** Shri Anindya Khare, MPPMCL

### **ORDER**

The Petitioner, Power Grid Corporation of India Limited, a deemed transmission licensee, has filed the instant petition for revision of transmission tariff of the 2001-04, 2004-09 and 2009-14 tariff periods; trueing of the capital expenditure for the period from 1.4.2014 to 31.3.2019 under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as “the 2014 Tariff Regulations”) and for determination of tariff under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as “the 2019 Tariff Regulations”) for the period from 1.4.2019 to 31.3.2024 in respect of transmission assets under Korba Transmission System in the Western 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 block, 2004-09 block & 2009-14 block 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 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. Further it is submitted that deferred tax liability before 01.04.2009 shall be recoverable from the beneficiaries or long term transmission customers /DIC 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 materialised directly without making any application before the commission as provided in the regulation.*

*4) Approve the reimbursement of expenditure by the beneficiaries towards petition*



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

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

*6) Allow the petitioner to adjust the cumulative depreciation by taking into account the depreciation recovered in tariff by the decapitalized asset during its useful life and to recover the unrecovered depreciation in case of Asset-I separately on account of de-capitalization.*

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

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

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

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

### **Background**

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

a) The transmission system for evacuation of power from Korba Super Thermal Power Station in the Western Region was approved by the Ministry of Power in two stages. In the first stage, approval of the transmission system for ₹10090.00 lakh was accorded, which was subsequently revised to ₹10510.00 lakh. In the second stage, the transmission system was approved for ₹4774.00 lakh. Subsequently, the combined revised capital investment for the transmission system was approved by Ministry of Power vide letter dated 1.8.1990 at an estimated cost of ₹24854.00 lakh.

b) The scope of the transmission system is as follows:

#### **Transmission lines**

- (i) 400 kV Korba-Korba transmission line
- (ii) 400 kV Korba-Bhilai Ckt-I,II &III
- (iii) 400 kV Bhilai-Koradi transmission line
- (iv) 400 kV Koradi-Satpura transmission line



- (v) 400 kV Satpura-Itarsi transmission line
- (vi) 400 kV Itarsi-Indore transmission line
- (vii) 400 kV Indore-Asoj transmission line
- (viii) 400 kV Bhilai-Bhadravati transmission line
- (ix) 400 kV Raipur- Bhadravati transmission line
- (x) 400 kV Bhadravati-Chandrapur-Ckt-I&II

**Sub-station extension**

- (i) 400 kV Indore Sub-station
- (ii) 400 kV Bhilai Sub-station
- (iii) 400 kV Koradi Sub-station
- (iv) 400 kV Itarsi Sub-station
- (v) 400 kV Satpura Sub-station
- (vi) 400 kV Asoj Sub-station
- (vii) 400 kV Bhadravati Sub-station
- (viii) 400 kV Chandrapur Sub-station

c) The complete scope of the work is covered in the instant petition. The date of commercial operation (COD) of the transmission asset is 1.4.1992.

d) The tariff from 1.4.2001 to 31.3.2004 for the transmission asset was allowed *vide* order dated 18.7.2003 in Petition No. 27/2002 in accordance with the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2001.

e) The tariff from 1.4.2004 to 31.3.2009 for the transmission asset was allowed *vide* order dated 15.12.2005 in Petition No.117/2004 in accordance with the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2004. Further, the tariff was revised *vide* order dated 14.2.2008 by way of implementation of the judgment of the Appellate Tribunal for Electricity (APTEL) dated 16.5.2007 in Appeal No. 121 of 2005.

f) The tariff for the 2009-14 tariff period was allowed *vide* order dated 3.4.2013 in Petition No. 145/2009.



g) The tariff for the 2009-14 tariff period was trued-up and tariff for the period from 1.4.2014 to 31.3.2019 was determined *vide* order dated 8.1.2016 in Petition No. 555/TT/2014.

h) The Petitioner has prayed for revision of transmission tariff allowed for the 2001-04 and 2004-09 tariff periods on account of change in Interest on Loan (IoL) and Interest on Working Capital (IWC) to the extent of revision in IoL and in Maintenance Spares in terms of the APTEL judgment dated 22.1.2007 and 13.6.2007 in Appeal No. 81/2005 and 139/2006 respectively. The Petitioner has sought consequential revision of tariff allowed for the 2009-14 tariff period and truing up of tariff of 2014-19 tariff period and determination of tariff for 2019-24 tariff period.

i) The APTEL in judgment dated 22.1.2007 in Appeal No. 81 of 2005 and batch matters pertaining to generating stations of NTPC had considered four issues. The issues considered by the APTEL and its decisions are as given in the following table:

<b>Sr. No.</b>	<b>Issue</b>	<b>APTEL's decisions/ directions</b>
1	Whether APTEL can enquire into the validity of Regulations framed by the Commission.	Challenge to the validity of Regulations framed by the Commission falls outside the purview of APTEL.
2	Computation of interest on loan.	In view of the order of the APTEL dated 14.11.2016 in Appeal No. 94 of 2005 and Appeal No. 96 of 2005 and order dated 24.1.2007 passed in Appeal Nos. 81 to 87, 89 to 93 of 2005, computation of loan has to be based on loan repayment on normative basis. Commission is required to recalculate the loan outstanding as on 31.3.2004 based on loan repayment on normative basis.
3(a)	O & M Expenses: Inadequate provision of employee costs as part of O&M Expenses due to variation in salary and wages	Commission's view upheld
3(b)	O & M Expenses: Non-inclusion of incentives and ex-gratia payment to employees	Commission's view upheld
4	Cost of spares for calculation of working capital	Commission's view upheld

j) The APTEL in its judgment dated 13.6.2007 in Appeal No.139 of 2006 and batch matters pertaining to generating stations of NTPC had considered 9



issues. The issues considered and the decisions of the APTEL are given in the following table:

<b>Sr. No.</b>	<b>Issue</b>	<b>APTEL's decisions/ directions</b>
I	Computation of outstanding loan at the beginning of the tariff period i.e. 1.4.2004	The Commission is required to recalculate the loan outstanding as on 31.3.2004 based on loan repayment on normative basis.
II	Consequence of refinance of Loan	Commission to consider the issue afresh
III	Treating depreciation available as deemed repayment of loan	Commission to make a fresh computation of outstanding loan
IV	Admissibility of depreciation up to 90%	Commission to consider the issue afresh
V	Cost of Maintenance Spares	Commission to consider the issue afresh
VI	Impact of de-capitalisation of the assets on cumulative repayment of Loan	The cumulative repayment of the loan proportionate to the assets decapitalized required to be reduced. Commission to act accordingly
VII	Non-consideration of normative transit loss for coal import.	Commission to consider afresh the transit losses for coal imported from coal mines other than the dedicated ones
VIII	Foreign Exchange rate variation (FERV)	FERV has been kept as pass through to ensure that any liability or gain, if any, arising on account of any variation in foreign exchange rates is passed on to the beneficiary as held in order dated 4.10.2006 in Appeals No.135 to 140 of 2005. Commission to act accordingly
IX	Computation of interest on loan in Singrauli Station	Net loan closing at the end of a year is reflected as net loan opening on the first day of the next year. Commission shall re-compute the interest accordingly



k) The Commission and certain interested parties preferred Civil Appeals against the APTEL's judgments before the Hon'ble Supreme Court in 2007. The Appeals were admitted and initially stay was granted by the Hon'ble Supreme Court. Subsequently, on an assurance by NTPC that the issues under Appeal would not be pressed for implementation during the pendency of the Appeals, the stay was vacated by the Hon'ble Supreme Court.

l) Based on APTEL's judgments dated 22.1.2007 in Appeal No. 81 of 2005 and 13.6.2007 in Appeal No. 139 of 2007 and the Commission's order dated 18.1.2019 in Petition No. 121/2007, the Petitioner had sought re-determination of transmission tariff of its transmission assets of the 2001-04 and 2004-09 tariff periods in Petition No. 121/2007. The Commission, after taking into consideration the pendency of Appeals before the Hon'ble Supreme Court, adjourned the said petition sine die and directed that the same be revived after the disposal of the Civil Appeals by the Hon'ble Supreme Court.

m) The Hon'ble Supreme Court *vide* order dated 10.4.2018, dismissed the said Civil Appeals. Thus, the said order of the APTEL has attained finality.

n) Consequent to the Hon'ble Supreme Court's order dated 10.4.2018, the Petition No. 121/2007 was listed for hearing before the Commission on 8.1.2019. The Commission, *vide* order dated 18.1.2019 in Petition No. 121/2007, directed the Petitioner to submit its claim separately for the assets at the time of filing of truing up of the petitions for the 2014-19 tariff period in respect of concerned transmission assets.

o) The instant petition was heard on 17.8.2021 and in view of APTEL's judgments dated 22.1.2007 in Appeal No. 81 of 2005 and batch matters along with order dated 13.6.2007 in Appeal No. 139 of 2006 and batch matters and the order of Hon'ble Supreme Court dated 10.4.2018, transmission tariff is being revised. Period-wise transmission tariff is being re-worked based on the Tariff Regulations applicable for the respective tariff periods, suitable assumptions at certain places, if required, are being applied which are indicated.





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

5. The Petitioner has served the petition on the Respondents and notice of this petition was published in the newspapers in accordance with Section 64 of the Electricity Act, 2003. No comments/ objections have been received from the general public in response to the aforesaid notice published in the newspapers by the Petitioner. Madhya Pradesh Power Management Co. Ltd. (MPPMCL), Respondent No. 1, has filed its reply *vide* affidavit dated 27.5.2020. MPPMCL has raised the issues of grossing-up of Return on Equity (RoE) and Additional Capital Expenditure (ACE) for the 2019-24 tariff period. The Petitioner, *vide* affidavit dated 10.8.2021, has filed rejoinder to the reply of MPPMCL.

6. It has been placed before us that MPPMCL has been raising the same issue(s) in other petitions as well despite clear findings of the Commission. The contentions of MPPMCL have been rejected by the Commission in other petitions including Petition No. 326/TT/2020 *vide* order dated 21.9.2021. As MPPMCL has not challenged the findings, the same have attained finality. In view of these, the pleas raised by MPPMCL are rejected. Also, MPPMCL's submissions, Petitioner's clarifications thereto and the Commission's findings on the said issue(s) have not been repeated herein for the sake of brevity. Further, the issues which are specific to the instant petition and not dealt by the Commission earlier are considered in the relevant portions of this order.



**Re: Interest on Loan (IoL)**

7. The APTEL while dealing with the issue of computation of IoL, in judgement dated 22.1.2007 in Appeal No. 81 of 2005 and batch matters observed that IoL for the period from 1.4.1998 to 31.3.2001 shall be computed only on normative loan repayment as per its judgement dated 14.11.2006 in Appeal No. 94 of 2005 and Appeal No. 96 of 2005. The APTEL *vide* judgement dated 14.11.2006 in Appeal No. 94 of 2005 and Appeal No. 96 of 2005 set aside the Commission's methodology of computation of loan on the actual repayment basis or normative repayment whichever is higher and held that the Commission is required to adopt normative debt repayment methodology for working out the IoL liability for the period from 1.4.1998 to 31.3.2001. In view of the judgement of APTEL, interest allowed for the 2004-09 period is to be revised on the basis of the normative debt repayment methodology.

**Re: Additional Capital Expenditure (ACE)**

8. APTEL in its judgement dated 13.6.2007 in Appeal No. 139 of 2006 and batch matters held that ACE after COD should also be considered for computation of maintenance spares. In view of the judgement of APTEL, maintenance spares to be considered for computation of working capital for the 2004-09 period are also required to be revised taking into consideration ACE after COD.

**Re: Depreciation**

9. As regards depreciation, the APTEL *vide* judgement dated 13.6.2007 in Appeal No. 139 of 2006 and batch matters observed that depreciation is an expense and it cannot be deployed for deemed repayment of loan and accordingly directed the Commission to compute the outstanding loan afresh. Accordingly, the outstanding loan allowed for the transmission asset for the 2004-09 period is revised in the instant order.



10. The revision of transmission tariff allowed for the 2001-04 and 2004-09 tariff periods necessitates the revision of transmission tariff allowed for the 2009-14 tariff period, which is also being done in the present order. The implementation of the directions of the APTEL vide judgments dated 22.1.2007 in Appeal No. 81 of 2005 and batch matters and dated 13.6.2007 in Appeal No. 139 of 2006 and batch matters respectively was kept pending awaiting for the outcome of the Civil Appeals filed before the Hon'ble Supreme Court. Taking into consideration the facts of the case and keeping in view the interest of the consumers, we are of the view that the beneficiaries should not be burdened with the carrying cost for the difference in the tariff allowed earlier and allowed in the instant order for the 2001-04, 2004-09 and 2009-14 tariff periods. Therefore, we direct that the Petitioner will neither claim nor pay any carrying cost from or to the beneficiaries for the difference, if any, in the tariff allowed earlier and the tariff being allowed in the instant order. Further, the said difference in tariff shall be recovered/ paid over a period of six months from the date of issue of this order.

11. This order is issued considering the submissions made by the Petitioner in the petition *vide* affidavit dated 15.1.2020, the Petitioner's affidavit dated 14.7.2021 and 12.8.2021, MPPMCL's reply filed *vide* affidavit dated 27.5.2020 and the Petitioner's rejoinder dated 10.8.2021.

12. The hearing in this matter was held on 17.8.2021 and the Commission reserved the order in the matter. Having heard the representatives of the Petitioner and perused the material on record, we proceed to dispose of the petition.



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

**2001-04 Period**

13. The Commission vide order dated 18.7.2003 in Petition No. 27/2002 had allowed the transmission charges for the transmission asset as follows:

	(₹ in lakh)		
Particulars	2001-02	2002-03	2003-04
Depreciation*	630.27	630.27	363.41
Interest on Loan	37.89	7.50	0.00
Return on Equity	1223.76	1223.76	1223.76
Advance against Depreciation	7.11	7.11	0.00
Interest on Working Capital	99.31	102.45	100.90
O&M Expenses	980.20	1039.02	1101.36
<b>Total</b>	<b>2978.54</b>	<b>3010.10</b>	<b>2789.43</b>

\*The Petitioner has made adjustment of ₹0.24 lakh as per direction in para 23 of order dated 15.12.2005 in Petition No. 117/2004.

14. The Petitioner has claimed the following revised transmission charges for the transmission asset for the 2001-04 tariff period in this petition:

	(₹ in lakh)		
Particulars	2001-02	2002-03	2003-04
Depreciation	630.03*	630.03*	363.17*
Interest on Loan	22.11	0.00	0.00
Return on Equity	1223.76	1223.76	1223.76
Advance against Depreciation	7.35	7.35	0.00
Interest on Working Capital	99.00	102.30	100.90
O&M Expenses	980.20	1039.02	1101.36
<b>Total</b>	<b>2962.44</b>	<b>3002.46</b>	<b>2789.19</b>

\* The Petitioner has made adjustment of ₹0.24 lakh as per direction in para 23 of order dated 15.12.2005 in Petition No. 117/2004

15. We have considered the submission of the Petitioner. The tariff is approved for the transmission asset on the basis of the following:

- a) Admitted capital cost as on 1.4.2001 of ₹23393.78 lakh vide order dated 18.7.2003 in Petition No. 27/2002.
- b) Weighted Average Rate of Interest on actual loan, Weighted Average Rate of Depreciation, Rate of Interest for Working Capital and O&M Expenses dated 18.7.2003 in Petition No. 27/2002.



c) As there was no additional capital expenditure (ACE) during 2001-04 period, there is no requirement to revise the maintenance spares component for calculating IWC.

16. In view of the above, the revised transmission charges allowed for the transmission asset for the 2001-04 tariff period are as follows:

(₹ in lakh)			
Particulars	2001-02	2002-03	2003-04
Depreciation	630.27	630.27	363.41
Interest on Loan	37.89	7.50	0.00
Return on Equity	1223.76	1223.76	1223.76
Advance against Depreciation	7.11	7.11	0.00
Interest on Working Capital	99.14	102.45	100.90
O&M Expenses	980.20	1039.02	1101.36
<b>Total</b>	<b>2978.54</b>	<b>3010.11</b>	<b>2789.43</b>

17. AFC allowed for the 2001-04 period *vide* order dated 18.7.2003 in Petition No. 27/2002, the revised AFC claimed in the instant petition and AFC approved in the instant order is given below:

Particulars	2001-02	2002-03	2003-04
AFC allowed <i>vide</i> order dated 18.7.2003 in Petition No. 27/2002	2978.54	3010.11	2789.43
AFC claimed by the Petitioner in the instant petition	2962.44	3002.46	2789.19
AFC approved in the instant order	2978.54	3010.11	2789.43

### **2004-09 Period**

18. The Commission *vide* order dated 15.12.2005 in Petition No.117/2004 had allowed the transmission charges for transmission asset for the 2004-09 tariff period. The transmission charges were revised *vide* order dated 14.2.2008 in Petition No. 117/2004 and the revised transmission charges for transmission asset for the 2004-09 tariff period are as follows:

(₹ in lakh)					
Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Depreciation	358.11	358.11	358.11	358.11	358.11
Interest on Loan	0.00	0.00	0.00	0.00	0.00



Return on Equity	1615.39	1615.39	1615.39	1615.39	1615.39
Advance against Depreciation	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	111.30	115.31	119.57	123.97	128.72
O&M Expenses	1169.09	1215.79	1265.71	1314.25	1368.77
<b>Total</b>	<b>3253.89</b>	<b>3304.60</b>	<b>3358.78</b>	<b>3411.72</b>	<b>3470.99</b>

19. The Petitioner has claimed the following revised transmission charges for the transmission asset for the 2004-09 tariff period in the instant petition:

(₹ in lakh)					
Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Depreciation	358.11	358.11	358.11	358.11	358.11
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	1615.39	1615.39	1615.39	1615.39	1615.39
Advance against Depreciation	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	100.23	103.58	107.13	110.79	114.74
O&M Expenses	1169.09	1215.79	1265.71	1314.25	1368.77
<b>Total</b>	<b>3242.82</b>	<b>3292.87</b>	<b>3346.34</b>	<b>3398.54</b>	<b>3457.01</b>

20. We have considered the submission of Petitioner. The tariff is approved for the transmission asset on the basis of the following:

- a) Admitted capital cost as on 1.4.2004 ₹23435.94 lakh *vide* revised order dated 14.2.2008 in Petition No.117/2004.
- b) Weighted Average Rate of Interest on actual loan, Weighted Average Rate of Depreciation, Rate of Interest for Working Capital and O&M Expenses *vide* revised order dated 14.2.2008 in Petition No. 117/2004.
- c) There is ACE during 2004-09 period. Hence, it is pertinent to revise the maintenance spares component for calculating IWC.

21. In view of the above, the revised transmission charges approved for the transmission asset for the 2004-09 tariff period is as follows:

(₹ in lakh)					
Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
Depreciation	358.15	358.15	358.15	358.15	358.15
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	1615.39	1615.39	1615.39	1615.39	1615.39



Advance against Depreciation	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	111.30	115.31	119.57	123.97	128.72
O&M Expenses	1169.09	1215.79	1265.71	1314.25	1368.77
<b>Total</b>	<b>3253.93</b>	<b>3304.64</b>	<b>3358.82</b>	<b>3411.76</b>	<b>3471.03</b>

22. AFC allowed for the 2004-09 period *vide* revised order dated 14.2.2008 in Petition No.117/2004, the revised AFC claimed in the instant petition and AFC approved in the instant order is given below:

Particulars	(₹ in lakh)				
	2004-05	2005-06	2006-07	2007-08	2008-09
AFC allowed <i>vide</i> revised order dated 14.2.2008 in Petition No. 117/2004	3253.89	3304.60	3358.78	3411.72	3470.99
AFC claimed by the Petitioner in the instant petition	3242.82	3292.87	3346.34	3398.54	3457.01
AFC approved in the instant order	3253.93	3304.64	3358.82	3411.76	3471.03

### **2009-14 Period**

23. The Commission *vide* order dated 3.4.2013 in Petition No. 145/2009 had allowed the tariff for the transmission asset for the 2009-14 tariff period. The tariff for the 2009-14 tariff period was trued-up as follows:

Particulars	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Depreciation	377.65	404.08	404.08	405.44	410.27
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	2164.99	2254.96	2257.17	2257.96	2287.64
Interest on Working Capital	152.95	161.06	167.19	173.63	181.08
O&M Expenses	1998.52	2112.17	2233.65	2361.57	2496.17
<b>Total</b>	<b>4694.11</b>	<b>4932.28</b>	<b>5062.09</b>	<b>5198.60</b>	<b>5375.15</b>

24. The Petitioner has claimed the following revised transmission charges in respect of the transmission asset for the 2009-14 period in this petition:

Particulars	(₹ in lakh)				
	2009-10	2010-11	2011-12	2012-13	2013-14
Depreciation	377.65	404.08	404.08	405.44	410.27
Interest on Loan	0.00	0.00	0.00	0.00	0.00



Return on Equity	2164.99	2254.96	2257.17	2257.96	2287.64
Interest on Working Capital	152.96	161.07	167.20	173.64	181.09
O&M Expenses	1998.52	2112.17	2233.65	2361.57	2496.17
<b>Total</b>	<b>4694.12</b>	<b>4932.28</b>	<b>5062.10</b>	<b>5198.61</b>	<b>5375.17</b>

25. We have considered the submissions of the Petitioner. The tariff is approved for the transmission asset on the basis of the following:

- a) Admitted capital cost of ₹23435.95 lakh as on 1.4.2009.
- b) Weighted Average Rate of Interest on actual loan and Weighted Average Rate of Depreciation as per order dated 8.1.2016 in Petition No. 555/TT/2014.
- c) ACE of ₹367.34 lakh for 2009-10, ₹27.07 lakh for 2012-13 and ₹58.83 lakh for 2013-14 had been approved by the Commission *vide* order dated 8.1.2016 in Petition No. 555/TT/2014 towards replacement of circuit breakers, surge arrestor, numeric distance relays.

26. In view of the above, the revised transmission charges approved in respect of the transmission asset for the 2009-14 tariff period are as follows:

(₹ in lakh)					
Particulars	2009-10	2010-11	2011-12	2012-13	2013-14
Depreciation	375.60	390.63	390.63	391.98	398.34
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	2164.99	2254.96	2257.17	2257.96	2287.64
Interest on Working Capital	152.91	160.78	166.91	173.35	180.83
O&M Expenses	1998.52	2112.17	2233.65	2361.57	2496.17
<b>Total</b>	<b>4692.03</b>	<b>4918.54</b>	<b>5048.36</b>	<b>5184.86</b>	<b>5362.98</b>

27. AFC allowed for the 2009-14 tariff period *vide* order dated 8.1.2016 in Petition No. 555/TT/2014, the revised AFC claimed in the instant petition and AFC approved in the instant order is as follows:

(₹ in lakh)					
Particulars	2009-10	2010-11	2011-12	2012-13	2013-14
AFC allowed <i>vide</i> order dated 8.1.2016 in Petition No. 555/TT/2014	4694.11	4932.28	5062.09	5198.60	5375.15
AFC claimed by the Petitioner in the instant petition	4694.12	4932.28	5062.10	5198.61	5375.17
AFC approved in the instant order	4692.03	4918.54	5048.36	5184.86	5362.98





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

28. The details of the transmission charges claimed by the Petitioner in respect of the transmission asset are as follows:

(₹ in lakh)					
<b>Particulars</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
Depreciation	396.51	396.52	396.51	396.52	396.50
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	2291.12	2301.62	2300.46	2300.46	2306.64
Interest on Working Capital	187.93	192.41	196.72	201.16	205.93
O&M Expenses	2281.98	2358.81	2437.26	2517.65	2601.41
<b>Total</b>	<b>5157.54</b>	<b>5249.36</b>	<b>5330.95</b>	<b>5415.79</b>	<b>5510.48</b>

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

(₹ in lakh)					
<b>Particular</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
O&M Expenses	190.17	196.57	203.11	209.80	216.78
Maintenance Spares	342.30	353.82	365.59	377.65	390.21
Receivables	859.59	874.89	888.49	902.63	918.41
Total Working Capital	1392.06	1425.28	1457.19	1490.08	1525.40
Rate of Interest (in %)	13.50	13.50	13.50	13.50	13.50
<b>Interest on Working Capital</b>	<b>187.93</b>	<b>192.41</b>	<b>196.72</b>	<b>201.16</b>	<b>205.93</b>

### **Capital Cost**

30. The capital cost has been calculated in accordance with Regulation 9(3) of the 2014 Tariff Regulations. The Commission *vide* order dated 8.1.2016 in Petition No.555/TT/2014 had allowed the following capital cost for the 2014-19 tariff period for transmission asset:

(₹ in lakh)		
<b>Admitted Capital Cost (as on 31.3.2014)</b>	<b>Admitted ACE during 2014-19</b>	<b>Admitted Capital Cost (as on 31.3.2019)</b>
23889.19	0.00	23889.19

31. The Capital cost of ₹23889.19 lakh as on 31.3.2014 allowed *vide* order dated 8.1.2016 in Petition No. 555/TT/2014 is considered as capital cost as on 1.4.2014 for



truing-up of tariff for the 2014-19 tariff period. The Petitioner has not claimed any ACE for the 2014-19 tariff period in the instant petition.

**Debt-Equity ratio**

32. The debt-equity ratio has been allowed in accordance with Regulation 19(3) of the 2014 Tariff Regulations. As per Regulation 19(3) of the 2014 Tariff Regulations, the debt-equity ratio of 51.13:48.87 for the period ending on 31.3.2014, considered for the purpose of determination of tariff of the 2014-19 tariff period has been considered for the purpose of truing up of the tariff of the transmission asset for the 2014-19 tariff period. The details of the debt-equity ratio as on 1.4.2014 and 31.3.2019 in respect of the transmission asset is as follows:

<b>Funding</b>	<b>Capital Cost (as on 1.4.2014) (₹ in lakh)</b>	<b>(in %)</b>	<b>Capital Cost (as on 31.3.2019) (₹ in lakh)</b>	<b>(in %)</b>
Debt	12214.70	51.13	12214.70	51.13
Equity	11674.48	48.87	11674.48	48.87
<b>Total</b>	<b>23889.18</b>	<b>100.00</b>	<b>23889.18</b>	<b>100.00</b>

**Depreciation**

33. Depreciation has been allowed as per the methodology provided in Regulation 27 of the 2014 Tariff Regulations. The transmission asset has already completed 12 years of life before 1.4.2014. Therefore, depreciation has been calculated based on the remaining depreciable value to be recovered over the balance useful life. The trued-up depreciation for the 2014-19 tariff period is as follows:

	<b>(₹ in lakh)</b>				
<b>Particulars</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
<b>Depreciation</b>					
Opening Gross Block	23889.19	23889.19	23889.19	23889.19	23889.19
ACE	0.00	0.00	0.00	0.00	0.00
Closing Gross Block	23889.19	23889.19	23889.19	23889.19	23889.19
Average Gross Block	23889.19	23889.19	23889.19	23889.19	23889.19
Weighted Average Rate of Depreciation (in %)	1.68	1.68	1.68	1.68	1.68
Aggregate Depreciable	21443.87	21443.87	21443.87	21443.87	21443.87



Value					
Balance useful life of the asset (Year)	7.00	6.00	5.00	4.00	3.00
Lapsed life	22.00	23.00	24.00	25.00	26.00
<b>Depreciation during the year</b>	<b>400.38</b>	<b>400.38</b>	<b>400.38</b>	<b>400.38</b>	<b>400.38</b>
Cumulative depreciation at the end of year	19041.59	19441.97	19842.35	20242.73	20643.11
Remaining Depreciable Value at the end of year	2402.28	2001.90	1601.52	1201.14	800.76

34. The details of depreciation allowed *vide* order dated 8.1.2016 in Petition No. 555/TT/2014, depreciation claimed by the Petitioner and trued-up in the instant order is as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed <i>vide</i> order dated 8.1.2016 in Petition No. 555/TT/2014	414.05	414.05	414.05	414.05	414.05
Claimed by the Petitioner in the instant petition	396.51	396.52	396.51	396.52	396.50
Approved after true-up in this order	400.38	400.38	400.38	400.38	400.38

### **Interest on Loan (IoL)**

35. Since the normative loan for the transmission asset has been completely repaid as the cumulative depreciation is more than the cumulative loan balance, the Petitioner has not claimed any interest on loan during the 2014-19 tariff period.

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

36. The Petitioner has prayed for RoE for the transmission asset 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 MAT rates and has claimed 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

37. The Commission in order dated 27.4.2020 in Petition No.274/TT/2019 has 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)	Base rate of RoE (in %)	Grossed-up ROE (in %) [(Base Rate)/(1-t)]
2014-15	20.961	15.50	19.610
2015-16	21.342	15.50	19.705
2016-17	21.342	15.50	19.705
2017-18	21.342	15.50	19.705
2018-19	21.549	15.50	19.758

38. The Petitioner has claimed ROE for the 2014-19 period after grossing up the ROE of 15.50% with Effective Tax rates (based on MAT rates) each year. Trued-up RoE on the basis of the MAT rate applicable in the respective years and allowed for the transmission asset are as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Opening Equity	11674.48	11674.48	11674.48	11674.48	11674.48
Additions	0.00	0.00	0.00	0.00	0.00
Closing Equity	11674.48	11674.48	11674.48	11674.48	11674.48
Average Equity	11674.48	11674.48	11674.48	11674.48	11674.48
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
<b>Return on Equity</b>	<b>2289.37</b>	<b>2300.46</b>	<b>2300.46</b>	<b>2300.46</b>	<b>2306.64</b>

39. The details of RoE allowed *vide* order dated 8.1.2016 in Petition No. 555/TT/2014, RoE claimed by the Petitioner and as trued-up in the instant order is as follows:

Particulars	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed <i>vide</i> order dated 8.1.2016 in Petition No.	2289.37	2289.37	2289.37	2289.37	2289.37



555/TT/2014					
Claimed by the Petitioner in the instant petition	2291.12	2301.62	2300.46	2300.46	2306.64
Approved after true-up in this order	2289.37	2300.46	2300.46	2300.46	2306.64

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

40. The O&M Expenses claimed by the Petitioner are as follows:

<b>Transmission lines</b>				
<b>Sr. No.</b>	<b>Name of Line</b>	<b>Single Circuit / Double Circuit</b>	<b>No of Sub-Conductors</b>	<b>Line Length Km</b>
1	Korba-Korba(W)	Single Circuit	2	14.000
2	Korba-Bhilai I	Single Circuit	2	197.000
3	Korba-Bhilai II	Single Circuit	2	192.000
4	Bhilai-Koradi	Single Circuit	2	272.000
5	Koradi-Satpura	Single Circuit	2	149.000
6	Satpura-Itarsi	Single Circuit	2	79.000
7	Itarsi-Indore II	Single Circuit	2	214.000
8	Indore-Asoj I	Single Circuit	2	289.000
9	Korba-Bhilai III (Now Korba-Sipat-Raipur-Bhilai)	Single Circuit	2	211.000
10	Bhilai-Bhadravati And Raipur-Bhadrawati I	Double Circuit	2	322.000
11	Bhadravati-Chandrapur Ckt I and II	Double Circuit	2	20.000
<b>Sr. No.</b>	<b>400 kV Substation bay</b>			
1	Indore:Itarsi 2			
2	Indore:Asoj 1			
3	Bhilai Substation:Korba I			
4	Bhilai Substation:Korba II			
5	Bhilai Substation:Koradi			
6	Koradi:Bhilai			
7	Koradi:Satpura			
8	Itarsi:Indore 2			
9	Itarsi:Satpura			
10	Satpura Substation:Itarsi			
11	Satpura Substation:Koradi			
12	Asoj:Indore I			
13	Bhilai Substation:Korba - III(Raipur)			
14	Bhilai Substation:Bhadravati I			
15	Bhilai Substation:Bhadravati II (Raipur)			
16	Chandrapur:Bhadravati I			
17	Chandrapur:Bhadravati II			
18	Bhadrawati:Bhilai I			
19	Bhadrawati:Bhilai II (Raipur)			
20	Bhadrawati:Chandrapur I			



21	Bhadrawati:Chandrapur II				
22	Bhadrawati:HVDC I				
23	Bhadrawati:HVDC II				
<b>O&amp;M Expenses</b>					
	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
<b>Sub-station</b>					
400 kV					
Number of bays	23	23	23	23	23
<b>Transmission lines</b>					
S/C Twin/Triple Conductor (km)	1617.00	1617.00	1617.00	1617.00	1617.00
D/C Twin/Triple Conductor (km)	342.00	342.00	342.00	342.00	342.00
<b>Total O&amp;M Expense (₹ in lakh)</b>	<b>2281.96</b>	<b>2358.81</b>	<b>2437.26</b>	<b>2517.67</b>	<b>2601.42</b>

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

Element	UoM	Norms for 2014-15	Norms for 2015-16	Norms for 2016-17	Norms for 2017-18	Norms for 2018-19
400 kV Sub-station	₹ lakh/bay	60.30	62.30	64.37	66.51	68.71
S/C Twin/Triple Conductor	₹ lakh/km	0.404	0.418	0.432	0.446	0.461
D/C Twin/Triple Conductor	₹ lakh/km	0.707	0.731	0.755	0.780	0.806

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

Details	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
23 Numbers of 400 kV Sub-station bays	1386.90	1432.90	1480.51	1529.73	1580.33
1617.00 km S/C Twin/Triple Conductor transmission line	653.27	675.91	698.54	721.18	745.44
342.00 km D/C Twin/Triple Conductor transmission line	241.79	250.00	258.21	266.76	275.65
<b>Total</b>	<b>2281.96</b>	<b>2358.81</b>	<b>2437.26</b>	<b>2517.67</b>	<b>2601.42</b>

43. The details of O&M Expenses allowed *vide* order dated 8.1.2016 in Petition No. 555/TT/2014, O&M Expenses claimed by the Petitioner and trued-up in the instant order is as follows:



(₹ in lakh)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed <i>vide</i> order dated 8.1.2016 in Petition No. 555/TT/2014	2281.96	2358.81	2437.26	2517.67	2601.42
Claimed by the Petitioner in the instant petition	2281.98	2358.81	2437.26	2517.65	2601.41
Approved after true-up in this order	2281.96	2358.81	2437.26	2517.67	2601.42

### Interest on Working Capital (IWC)

44. IWC has been worked out as per the methodology provided in Regulation 28 of the 2014 Tariff Regulations and true-up IWC has been allowed for the transmission asset as follows:

(₹ in lakh)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
<b>Interest on Working Capital</b>					
WC for O&M Expenses (1 month of O&M Expenses)	190.16	196.57	203.11	209.81	216.78
WC for Maintenance Spares (Maintenance Spares @ 15% of O&M Expenses)	342.29	353.82	365.59	377.65	390.21
WC for Receivables (Receivables equivalent to 2 months of fixed cost)	859.95	875.35	889.15	903.29	919.08
<b>Total Working Capital</b>	<b>1392.40</b>	<b>1425.74</b>	<b>1457.85</b>	<b>1490.75</b>	<b>1526.08</b>
Rate of Interest (in %)	13.50	13.50	13.50	13.50	13.50
<b>Interest on Working Capital</b>	<b>187.97</b>	<b>192.48</b>	<b>196.81</b>	<b>201.25</b>	<b>206.02</b>

45. The details of IWC allowed *vide* order dated 8.1.2016 in Petition No. 555/TT/2014, IWC claimed by the Petitioner and true-up in the instant order is as follows:

(₹ in lakh)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Allowed <i>vide</i> order dated 8.1.2016 in Petition No. 555/TT/2014	188.28	192.52	196.86	201.30	205.93
Claimed by the Petitioner in the instant petition	187.93	192.41	196.72	201.16	205.93
Approved after true-up in this order	187.97	192.48	196.81	201.25	206.02



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

46. The trued-up annual fixed charges for the transmission asset for the tariff period 2014-19 are summarised as follows:

(₹ in lakh)					
<b>Particulars</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
Depreciation	400.38	400.38	400.38	400.38	400.38
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	2289.37	2300.46	2300.46	2300.46	2306.64
O&M Expenses	2281.96	2358.81	2437.26	2517.67	2601.42
Interest on Working Capital	187.97	192.48	196.81	201.25	206.02
<b>Total</b>	<b>5159.68</b>	<b>5252.12</b>	<b>5334.91</b>	<b>5419.76</b>	<b>5514.46</b>

47. Accordingly, AFC allowed vide order dated 8.1.2016 in Petition No. 555/TT/2014, as claimed by the Petitioner and approved after truing up in the instant order is as follows:

(₹ in lakh)					
<b>Particulars</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
Allowed vide order dated 8.1.2016 in Petition No. 555/TT/2014	5173.66	5254.75	5337.54	5422.39	5510.76
Claimed by the Petitioner in the instant petition	5157.54	5249.36	5330.95	5415.79	5510.48
Approved after true-up in this order	5159.68	5252.12	5334.91	5419.76	5514.46

### **DETERMINATION OF ANNUAL FIXED CHARGES FOR THE 2019-24 TARIFF PERIOD**

48. The Petitioner vide affidavit dated 12.8.2021 has revised its submissions and has claimed the following transmission charges for the 2019-24 tariff period:

(₹ in lakh)					
<b>Particulars</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Depreciation	396.53	967.45	269.13	850.77	1502.70
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	2192.70	2217.02	2272.02	2363.52	2469.14
O&M Expenses	1856.90	1922.58	1989.56	2059.39	2132.11
Interest on Working Capital	119.86	131.89	124.92	138.05	152.64
<b>Total</b>	<b>4565.99</b>	<b>5238.94</b>	<b>4655.63</b>	<b>5411.73</b>	<b>6256.59</b>





49. The details of IWC claimed by the Petitioner for the 2019-24 period are as follows:

Particular	(₹ in lakh)				
	2019-20	2020-21	2021-22	2022-23	2023-24
O&M Expenses	154.74	160.22	165.80	171.62	177.68
Maintenance Spares	278.54	288.39	298.43	308.91	319.82
Receivables	561.39	645.90	572.49	665.11	769.25
<b>Total Working Capital</b>	<b>994.67</b>	<b>1094.51</b>	<b>1036.72</b>	<b>1145.64</b>	<b>1266.75</b>
Rate of Interest (in %)	12.05	12.05	12.05	12.05	12.05
<b>Interest on Working Capital</b>	<b>119.86</b>	<b>131.89</b>	<b>124.92</b>	<b>138.05</b>	<b>152.64</b>

### **Capital Cost**

50. Regulation 19 of the 2019 Tariff Regulations provide 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 tried 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.”

51. The Petitioner has claimed capital cost of ₹23889.19 lakh as on 31.3.2019 for the transmission asset. The same has been worked out by the Commission as on 31.3.2019 and 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 (ACE)**

52. Regulation 24 of the 2019 Tariff Regulations provides as follows:

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

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

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

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

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

53. The Petitioner, vide affidavit dated 15.1.2020, has projected the following ACE during 2019-24 for the transmission asset:



Particulars	Capital Cost (₹ in lakh)	Remarks
Total Cost as on 31.3.2019	<b>23889.18</b>	
ACE 2020-21	1116.71	
Decapitalisation 2020-21	152.09	Retrofitting of isolators & Circuit Breakers at Bhadrawati & Insulator Replacement on Korba-Bhilai-1 Line & Korba-Sipat Line
ACE 2021-22	1607.00	Replacement of Sub-station equipment & civil work
Decapitalisation 2021-22	310.83	Insulator Replacement on Korba-Bhiali 2 and Bhilai-Bhadrawati-2 Line & Retrofitting of isolators at CSPTCL Bhilai and Circuit Breakers at MSETCL Chandrapur
ACE 2022-23	1759.08	Replacement of Sub-station equipment & civil work
Decapitalisation 2022-23	277.42	Insulator Replacement in Korba-Korab(W), Koradi-satpura & Bhilai-Bhadrawati-1 Line
ACE 2023-24	1766.42	Replacement of Sub-station equipment & civil work
Decapitalisation 2023-24	71.19	Insulator Replacement at Bhilai-Koradi Line
<b>Total Cost as on 31.3.2024 as per Auditor's Certificate</b>	<b>29326.87</b>	

54. The Petitioner *vide* affidavit dated 12.8.2021 has revised its submissions and has projected the following ACE during 2019-24 for the transmission asset:

Particulars	Capital Cost (₹ in lakh)	Remarks
Total Cost as on 31.3.2019	<b>23889.18</b>	
ACE 2020-21	1116.71	
Decapitalisation 2020-21	152.09	Retrofitting of isolators & Circuit Breakers at Bhadrawati & Insulator Replacement on Korba-Bhilai-1 Line & Korba-Sipat Line
ACE 2021-22	1607.00	Replacement of Sub-station equipment & civil work
Decapitalisation 2021-22	310.83	Insulator Replacement on Korba-Bhiali 2 and Bhilai-Bhadrawati-2 Line & Retrofitting of isolators at CSPTCL Bhilai and Circuit Breakers at MSETCL Chandrapur
ACE 2022-23	3227.82	Replacement of Sub-station equipment & civil work
Decapitalisation 2022-23	641.25	Insulator Replacement in Korba-Korab(W), Koradi-satpura & Bhilai-Bhadrawati-1 Line
ACE 2023-24	1766.42	Replacement of Sub-station equipment & civil work
Decapitalisation 2023-24	105.98	Insulator Replacement at Bhilai-Koradi Line
<b>Total Cost as on 31.3.2024 as per Auditor's Certificate</b>	<b>30396.99</b>	



55. The Petitioner has submitted that Current Transformers (CT), Circuit Breakers (CB), Wave Traps (WT), Control & Protection Panels and Power & Control Cables of the Korba Transmission System were put to commercial operation during 1992-93 and some of the equipment have worn out, leading to frequent faults, burn outs and repairs. CTs & Capacitive Voltage Transformers (CVT) have completed more than 25 years of service. Frequent oil leakages and hot spots are observed due to ageing. These CTs & CVTs have become obsolete. Therefore, neither timely support from Original Equipment Manufacturer (OEM) nor spares are available. There are chances of breakdown which may create element outage due to failure. Isolators installed have completed more than 25 years of service. There is problem of frequent misalignments, jamming, improper closing/ opening, over travel, sluggishness in operating mechanism and hot spots due to ageing. Most of the times, even local operation also becomes difficult. Outage hours are increased due to the above issues. Also, WTs have completed more than 25 years of service. As a result, failure of terminal connectors occurs frequently and there have been incidences of burning of WTs & unwinding of WT coils because of deterioration of insulation between turns of coil due to ageing. Dismantling of complete WTs is also required for rectification of above issues, which increase outage period of the element. Most of the relays installed are of static type. Due to ageing, problem of mal-operation/ nonoperation occurs frequently because relay contacts get stuck up as coils of auxiliary relays have weakened. Moreover, operation of switchyard equipment from Control Panel is difficult due to ageing of switches. Power & Control Cables, Wiring & Terminal Blocks inside both Control & protection panels and Equipment MBs have become brittle leading to DC leakages and other frequent failures. These issues result in spurious/ non-desirable tripping of elements. Therefore, it has become necessary to replace above mentioned equipment



in a progressive manner so that the system is not affected and also for the smooth functioning of the system. The Petitioner has further submitted that the same is covered under Regulation 25(2) of the 2019 Tariff Regulations. The Petitioner has claimed extension of life of the transmission asset by 5 years starting from 2021-22.

56. Besides the above submissions, the Petitioner *vide* affidavit dated 14.7.2021 has submitted as under:

- a) The work of proposed replacement of equipment is yet to be started and exact package-wise and vendor-wise details cannot be confirmed now in advance as it depends on many factors such as shutdown availability as the work is to be carried out in the existing system and the exact requirements as per site conditions, etc. However, the equipment will be replaced as early as possible. The exact package-wise and vendor-wise details of ACE will be submitted after completion of the work during true-up of 2019-24 tariff period.
- b) No building and civil works are proposed as part of ACE for 2019-24 tariff period in the instant petition.
- c) All assets are currently in use and there has been no decapitalization till now. The work of proposed replacement of equipment is yet to be started and exact date of dismantling of old equipment cannot be ascertained now in advance as it depends on many factors as discussed above. The exact date will be submitted after completion of the work in true-up of 2019-24.

57. MPPMCL has submitted that the Petitioner has proposed ACE and de-capitalization during the 2019-24 period on the plea that the equipment have been installed long back and some of them have completed their service life. MPPCML has further submitted that the Petitioner has not submitted any study to show the need to replace the equipment on priority and the reasons.

58. In response, the Petitioner has submitted the following justifications for ACE claimed:





a) Capacitive Voltage Transformers (CVT) (15 numbers):

These CVTs are of BHEL/ WSI make and were commissioned during 1987 to 1989 and already completed more than 30 years of service life. CVTs are used for protection and metering purpose. Due to ageing, leakage/ seepage from multiple points such as EMU tank, oil level glass, secondary terminal boxes are observed. Due to ageing, capacitance of the CVTs have changed due to internal failure of capacitor elements resulting into drift in secondary voltage. CVT's secondary output is used in metering and protection system, therefore becomes vital for metering and protection. The variation in secondary voltage may result into inaccurate metering and wrong operation of protection relays of transmission elements. The CVTs are hermetically sealed equipment and repairing of these equipment at site level is not recommended.

After 25 years of operation repairing of the CVTs at manufacturer works is also not techno-economically viable due to change in design by the manufacturer and repair requires change of majority part of CVT even in case of problem in only part of equipment. Moreover, manufacturer also stopped manufacturing and repair works of these types of CVTs. In view of that, it is proposed to replace 6 numbers CVT at Indore Sub-station, 3 numbers at Asoj Sub-station and 6 numbers at Satpura Sub-station.

b) CB Relay panel (5 numbers), CB control panel (5 numbers), Line protection panel (5 numbers) & Reactor protection panels (5 numbers):

- i. These panels were installed during 1987 to 1989 and have already completed more than 30 years of service.
- ii. These relays are of electromechanical / static type and obsolete. The OEMs have also phased out these models of relays and there is no more spares and service support available.
- iii. Due to non-availability of spare, in case of any problem, the relays are to be kept out of service to avoid mal operation and the only option left is replacement.



- iv. Due to ageing, problem of mal-operation/non-operation have been experienced because of problem in the coils, sluggish operation of contacts etc.
  - v. Non-operation or mal-operation of relays may result into failure to protect in case of transmission system fault and also lead to failure of costly equipment like transformers/ Reactors. In worst situation it may result into grid disturbance also.
  - vi. Further, these relays are not Numerical type and does not comply IEC 61850. The relays do not have DR and time synchronization facility therefore does not help in fault analysis through stored tripping and event data.
  - vii. The Cable, Wiring & Terminal Blocks (TB) inside both control and protection panels and Equipment MBs have become brittle leading to DC leakages and other circuit failures. It is not feasible to replace the TBs and wiring inside these old and damaged panels.
  - viii. In view of above, it is proposed to replace 5 numbers CB relay panel, 5 numbers CB control panels, 5 numbers line protection panels and 5 numbers reactor protection panels at Asoj, Indore & Satpura Sub-stations.
- c) Current Transformer (CT) (15 numbers):
- i. These CTs are of BHEL/WSI make dead tank type with porcelain housing and have already completed 25 years of service life. Oil leakages from different points such as dead tank joint gasket portion, secondary terminals, primary terminals, domes, oil sight glass etc have been noticed in many of these CTs.
  - ii. As there is leakage in the CTs, in long run it may lead to low oil level, moisture ingress and subsequent failure. The CTs are hermetically sealed equipment and therefore major repair at site is not recommended. Further as there is ingress of moisture, complete replacement of active insulation part is required at manufacturer works, which will not be techno-economically viable. OEM M/s Alstom (which has taken over WSI) has confirmed that these CTs are irreparable. In view of that, it is





proposed to replace 6 numbers CT at Indore, 3 numbers at Asoj and 6 numbers at Satpura Sub-stations.

d) Isolators (17 numbers):

- i. These Isolators are of Horizontal Central Break (HCB) or pantograph type and are of S&S/Siemens make. These have already completed more than 30 years of service and have become obsolete.
- ii. Frequent problems of misalignment are being faced in HCB isolators. Issue of moving arms during operation of pantograph isolators are also faced. Current transfer assembly on isolator top and other major spares are now no more available in most of the cases due to old/obsolete design of isolators, thus creating problem in maintaining these old isolators. Rusting has also been observed in gear assembly and mechanism box. Due to these constraints in maintaining isolators, frequent breakdowns are being experienced despite all efforts. Due to improper health of isolator specially interlock mechanism, drive mechanism etc the isolators are unable to maintain the stable condition during storms and high wind conditions and getting opened in 'On Load' condition which is dangerous to system as well as to the operating personal.
- iii. Due to rusting, many MOM boxes got damaged leading to problem in components of MOM boxes and motorised operation of isolator not possible. This leads to problem in proper indication, control, interlock and remote operation of isolators which is not safe. Due to ageing, the TBs inside the MOM boxes has become brittle and many times terminals comes in contact with boxes and creates DC earth fault, which is detrimental to the control and protection system.
- iv. Due to age and wear tear, many times even local operation also becomes difficult. Further, timely support is not available from OEM due to old design. Existing spares have already been exhausted. Failure of any component may lead to improper and un-reliable operation of isolator/ Earth switches and risk to the system and safety of O&M staff. M/s S&S vide email dated: 12.12.2019 and M/s Siemens vide email



dated 25.2.2020 stated that isolators of these lots cannot be repaired and advised for replacement.

v. In view of that, it is proposed to replace 4 sets of 420 kV Isolators at Indore, 5 sets at Asoj and 8 sets at Satpura Sub-stations.

e) Power & Control cables:

i. These Power and Control cables are in service for more than 30 years. Due to ageing most of the control/ power cables laid in the sub-station have aged, deteriorated and showing sign of surface damages/ cracks, causing earth faults and DC earth leakages and many times resulting into mal-operation of control and protection system. It will be unsafe and also difficult to re-use inter-pole cables after replacement of equipment. Hence, it is required to replace inter-pole cables in the switchyard, especially the cables laid between poles of isolators, CT, CVT and between C&R panels and equipment for smooth operation of Sub-station. Hence in view of above it is proposed to replace inter-pole cables of Isolator, CB, Isolators, CT at Indore, Asoj and Satpura Sub-stations.

f) Switchyard BBCC/PCC and gravel filling in switchyard:

i. Gravel in switchyard of the considered bays at Indore, Asoj and Satpura is damaged (became fade, mixed with soil and silt and converted into small pieces) at various locations. BBCC/PCC were not provided in these old stations. Due to this, wild vegetation, grasses etc. are growing continuously which becomes breeding ground for reptiles & other animals, apart from this there is also a risk of increase in Step & Touch Potential due to bad quality of gravels. This is dangerous for safety point of view for both equipment and humans. In view of above it is proposed to carry out PCC and gravel spreading at Indore, Asoj and Satpura Sub-stations, in the Petitioner owned bays.

g) Wave Trap (WT) (3 numbers):

i. These hanging type wave traps were installed during 1987 to 1989. These have already completed more 30 years of service. Due to ageing, instances of uncoiling of wave traps have been observed.



- ii. Inter turn insulation between coils of WT has also deteriorated due to ageing. WT plays an important role in operation of PLCC system. Failure of WT shall result in maloperation of PLCC based protection system. In view of that it is proposed to replace 1 number WT at Asoj Sub-station and 2 numbers at Satpura Sub-station.
- h) Isolators (26 sets):
- i. These Isolators are of S&S power make and were installed in 1984. All of them have already completed more than 35 years of service and have become obsolete.
  - ii. These isolators are mainly of HCB type and frequent problem of misalignment are being faced. Current transfer assembly on isolator top and other major spares are now no more available in most of the cases due to old/obsolete design of isolators, thus creating problem in maintaining these old isolators. Rusting has also been observed in gear assembly and mechanism box. Due to these constraints in maintaining isolators, frequent breakdown are being experienced despite all efforts. Due to improper health of isolator specially interlock mechanism, drive mechanism etc the isolators are unable to maintain the stable condition during storms and high wind conditions and getting opened in 'On Load' condition which is dangerous to system as well as to the operating personal.
  - iii. Due to rusting, many MOM boxes got damaged leading to problem in components of MOM boxes and motorised operation of isolator not possible. This leads to problem in proper indication, control, interlock and remote operation of isolators which is not safe. Due to ageing, the TBs inside the MOM boxes has become brittle and many times terminals comes in contact with boxes and creates DC earth fault, which is detrimental to the control and protection system.
  - iv. Many times even local operation also becomes difficult. Further, these isolators have become obsolete, therefore neither timely support from OEM due to old design. Existing spares have already been exhausted. Failure of any component may lead to improper and un-reliable operation of isolator/ Earth switches and risk to the system and safety of O&M



staff. Further, as these isolators have become obsolete, therefore neither timely support from OEM nor spares are available.

v. In view of that, it is proposed to replace 26 sets of 420 kV Isolators of Petitioner owned bays at Bhilai CSPTCL Sub-station.

i) 220 V & 48 V Battery bank (1 set each):

i. Existing 220V and 48V battery banks are in service for more than 15 years. The capacity of batteries has been degraded. 220V battery is used for control & protection system while the 48V battery is used for PLCC system, both plays a vital role for the protection system. Due to low backup of batteries, protection system always remains at risk during outage of auxiliary power. For proper working of protection system, healthiness of 220 V and 48 V battery system is very much essential. In view of that, it is proposed to replace 220 V and 48 V battery bank at CSPTCL Bhilai.

j) Replacement of Insulators, Rectification of rusted/ corroded legs, Additional earthing in transmission lines:

- i. All these lines were commissioned during 1983 to 1990 and already completed more than 30 years of service.
- ii. Incidence of frequent tripping of lines due to insulator failures are observed. Over the years the pollution level increased resulting in frequent failures of porcelain insulators. Presently polymer insulators are being provided in new lines to overcome these incidences.
- iii. These lines have already completed more than 30 years of service and due to ageing some of the leg members got rusted, which may become critical if not attended in time. The life of transmission lines will increase significantly if corroded leg members of lines be replaced/ rectified properly.
- iv. Due to ageing the earthing of transmission lines has been 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 in the insulator causing not only outage of the line, but also failure of the insulators. Further many incidences of tripping are observed due to weaker earthings in lines. To overcome these



incidences of unwanted tripping due to improper earthings, additional earthings are required to be provided in transmission line.

- v. In view of above, it is proposed to replace porcelain insulators with polymer insulators, replacement of rusted/ corroded leg members and to provide additional earthings in following lines :

- a) 400 kV S/C Bhilai-Koradi
- b) 400 kV S/C Koradi-Satpura
- c) 400 kV SIC Korba-Bhilai #1
- d) 400 kV S/C Korba-Bhilai #2
- e) 400 kV S/C Korba-Korba (W)
- f) 400 kV D/C Bhilai/Raipur-Bhadrawati 1 & 2
- g) 400 kV D/C Bhadrawati-Chandrapur 1 & 2
- h) 400 kV S/C Korba-Sipat

k) 420 kV Circuit Breaker (CB) (3 sets):

- i. These CBs of BHEL make were commissioned 30 years back in the year 1989 and now these models are obsolete.
- ii. Circuit breakers are giving frequent maintenance problems such as hydraulic drive/Magnetic ventil failures, air leakages from the various parts of the mechanisms, SF6 gas leakages etc. leading to prolonged outages causing unstable grid operation.
- iii. Mismatch in timing results and violation of DCRM signature also observed in many cases. This may cause failure of CBs in service. Frequent adjustment of auxiliary contact are also required due to ageing of mechanisms.
- iv. Manufacturers have also stopped manufacturing said model of CBs. The spares and service support from the OEM since quite some time has been very poor and cost of spares are exorbitantly high and is also consuming huge time. Subsequently OEM has stopped giving service support.
- v. In view of the above it is proposed to replace 1 set 420 kV CB at Bhadrawati Sub-station and 2 sets at MSETCL Chandrapur Sub-station.

l) Isolators (45 sets):

- i. These Isolators are of Rade Koncar make were installed in 1984. All of them have already completed more than 35 years of service life and are obsolete.



- ii. These isolators are mainly of HCB type and frequent problem of misalignment are being faced. Current transfer assembly on isolator top and other major spares are now no more available in most of the cases due to old/obsolete design of isolators, thus creating problem in maintaining these old isolators. Rusting has also been observed in gear assembly and mechanism box. Due to these constraints in maintaining isolators, frequent breakdown are being experienced despite all efforts. Due to improper health of isolator specially interlock mechanism, drive mechanism etc the isolators are unable to maintain the stable condition during storms and high wind conditions and getting opened in ON LOAD condition which is dangerous to system as well as to the operating personal.
  - iii. Due to rusting, many MOM boxes got damaged leading to problem in components of MOM boxes and motorised operation of isolator not possible. This leads to problem in proper indication, control, interlock and remote operation of isolators which is not safe. Due to ageing, the TBs inside the MOM boxes has become brittle and many times terminals comes in contact with boxes and creates DC earth fault, which is detrimental to the control and protection system.
  - iv. Many times even local operation also becomes difficult. Further, these isolators have become obsolete, therefore neither timely support from OEM due to old design. Existing spares have already been exhausted. Failure of any component may lead to improper and un-reliable operation of isolator/ Earth switches and risk to the system and safety of O&M staff. Further, as these isolators have become obsolete, therefore neither timely support from OEM nor spares are available. M/s S&S vide e-mail dated 12.12.2019 stated that these isolators cannot be repaired and advised for replacement.
  - v. In view of that, it is proposed to replace 37 sets of 420 kV Isolators at Bhadrawati Sub-station and 8 sets at Chandrapur Sub-station.
- m) 50 MVAR, Raipur-I L/R at Bhadrawati (Year of manufacturing-1985):
- i. Condition based monitoring/ maintenance of transformers/ reactors like DGA, tan delta measurement of bushings & windings, oil parameters,



Furan analysis, Frequency Domain Spectroscopy (FDS), IR of core insulation etc. are being carried out by the Petitioner to know the healthiness. From the test results of the said equipment, it was observed that Core Insulation resistance (Core Clamp-Core Lamination (IR (CC-CL) is zero which indicate inadvertent core grounding, Furan content was high which shows deterioration of solid insulation. A third-party M/s CPRI was approached by the Petitioner to analyze the test results of said equipment and to know the condition of the equipment and residual life. The test results were analyzed by CPRI and based on the test results, CPRI has recommended to replace the said unit. The availability of line reactor is very much required for keeping the line in service/ at the time of taking line into service. Said reactor have already completed more than 25 years of useful service life and due to ageing chances of its failure is always high. In service failure of reactor will cause long outage of reactor, which may result in forced outage of line due to rise in voltage. In view of that, it is proposed to replace the 50 MVAR Raipur-1 line reactor at Bhadrawati Sub-station.

n) 50 MVAR, Ramagundam-I & II L/R at Bhadrawati (Year of manufacturing-1985):

- i. 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 by the Petitioner to know the healthiness. From the test results of the said equipment, it was observed that Core IR is very low which indicate inadvertent core grounding, Furan content was high which shows deterioration of solid insulation. A third party M/s CPRI was approached by PowerGrid to analyze the test results of said equipment and to know the condition of the equipment and residual life. The test results were analyzed by CPRI and based on the test results, CPRI has recommended to replace the said unit. The availability of line reactor is very much required for keeping the line in service/ at the time of taking line into service. Said reactor have already completed more than 25 years of useful service life and due to ageing chances of its failure is



always high. In service failure of reactor will cause long outage of reactor, which may result in forced outage of line due to rise in voltage. In view of that, it is proposed to replace the 50 MVAR Ramagundam-1 and 2 line reactors at Bhadrawati Sub-station.

59. The details of ACE claimed by the Petitioner are as follows:

(₹ in lakh)				
Year	Particulars	Transmission Line	Sub-station	Total
2020-21	ACE	799.00	317.71	<b>1116.71</b>
	De-cap	(83.18)	(68.91)	<b>(152.09)</b>
2021-22	ACE	737.00	870.00	<b>1607.00</b>
	De-cap	(270.60)	(40.23)	<b>(310.83)</b>
2022-23	ACE	1203.23	2024.59	<b>3227.82</b>
	De-cap	(277.42)	(363.83)	<b>(641.25)</b>
2023-24	ACE	1497.50	268.92	<b>1766.42</b>
	De-cap	(71.19)	(34.79)	<b>(105.98)</b>

60. We have considered the submissions made by the Petitioner and MPPMCL. It is observed that the transmission asset was put into commercial operation on 1.4.1992 and has completed more than 28 years of its useful life. The Petitioner has proposed ACE at the fag end of the useful life of the transmission asset. The proposed ACE is towards replacement of various sub-station equipment such as (1) replacement of old and obsolete 6 numbers CVTs at Indore sub-station, 3 numbers CVTs at Asoj sub-station and 6 numbers CVTs at Satpura sub-station (2) replacement of old and obsolete 5 numbers CB relay panels, 5 numbers CB control panels, 5 numbers line protection panels and 5 numbers reactor protection panels at Asoj, Indore and Satpura sub-stations, (3) replacement of old and obsolete 6 numbers of CTs at Indore sub-station, 3 numbers CTs at Asoj sub-station and 6 numbers CTs at Satpura sub-station, (4) replacement of old and obsolete 4 sets of 420 kV isolators at Indore sub-station, 5 sets of 420 kV isolators at Asoj sub-station and 8 sets of 420 kV isolators at Satpura sub-station, (5) replacement of old and obsolete Power and Control cables at Asoj, Indore and Satpura sub-stations, (6) BBCC/PCC and gravel





spreading at switchyard of Asoj, Indore and Satpura sub-stations, (7) replacement of old and obsolete 1 number WT at Asoj Sub-station and 2 numbers WTs at Satpura sub-station, (8) replacement of old and obsolete 26 sets of 420 kV Isolators at Bhilai CSPTCL sub-station, (9) replacement of old and obsolete 220 V and 48 V battery bank at Bhilai CSPTCL sub-station, (10) replacement of insulators, rectification of rusted/ corroded legs, additional earthing in transmission lines, (11) replacement of old and obsolete 1 set of 420 kV CB at Bhadrawati and 2 sets of 420 kV CB at MSETCL Chandrapur, (12) replacement of old and obsolete 37 sets of 420 kV isolators at Bhadrawati and 8 sets of 420 kV isolators at MSETCL Chandrapur, (13) replacement of 50 MVAR line reactor at Bhadrawati and (14) 50 MVAR Ramagundam-1&2 line reactors at Bhadrawati. The proposed ACE claimed by the Petitioner for FY 2020-21, 2021-22 and 2023-24 are towards replacement of isolators, CTs, CVTs, CB, insulator replacement, control and relay panels due to obsolescence of technology. These items are of critical nature and their failure may affect the stability and reliability of the grid. Keeping in view the justifications provided by the Petitioner on affidavit, 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 the actual cost of the replaced equipment sub-station wise at the time of truing up.

61. It is observed that ACE claimed for 2022-23 includes replacement of sub-station equipment like CTs, CBs, CVTs, isolators etc. along with replacement of 50 MVAR reactors at Bhadrawati and Ramagundam-1&2 sub-stations. The Petitioner has not provided break-up of the cost of various sub-station equipment and reactors. We are not able to identify the specific cost pertaining to the line reactors proposed towards replacement of 50 MVAR line reactor at Bhadrawati sub-station and 50 MVAR Ramagundam-1&2 line reactors at Bhadrawati sub-station. Hence, in absence of any



bifurcation available, we are not inclined to allow the entire ACE claim and corresponding decapitalisation pertaining to sub-station for the year 2022-23. We observe that the Petitioner has also projected ACE for replacement of 50 MVAR line reactor at Bhadrawati and 50 MVAR Ramagundam-1&2 line reactors at Bhadrawati sub-station after the completion of useful life of the equipment covered under the transmission asset. We observe that these line reactors are major elements of the transmission asset which are critical and high value elements. So, we are of the view that if such items are to be replaced, it is prudent that studies are carried out to examine its requirement in today's system condition and discussed in RPC. Accordingly, the projected ACE towards the afore-mentioned line reactors 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 "Reactors" for consideration by the Commission. In view of the above, we are not inclined to allow ACE of ₹2024.59 lakh in 2022-23 and the corresponding de-capitalisation of ₹363.83 lakh in 2022-23 claimed by the Petitioner under Regulation 25(2) of the 2019 Tariff Regulations

62. The detailed break-up of ACE allowed is as follows:

		(₹ in lakh)					
Particulars		2019-20	2020-21	2021-22	2022-23	2023-24	Total
ACE	A	0.00	1116.71	1607.00	1203.23	1766.42	<b>5693.36</b>
Decapitalisation	B	0.00	152.09	310.83	277.42	105.98	<b>846.32</b>
<b>Net ACE</b>	<b>C=A-B</b>	<b>0.00</b>	<b>964.62</b>	<b>1296.17</b>	<b>925.81</b>	<b>1660.44</b>	<b>4847.04</b>

63. Accordingly, the capital cost considered for the 2019-24 tariff period is as follows:

(₹ in lakh)						
Total Capital Cost (as on 1.4.2019)	2019-20	2020-21	2021-22	2022-23	2023-24	Total Capital Cost (as on 31.3.2024)
23889.19	0.00	964.62	1296.17	925.81	1660.44	28736.23



## **Adjustments to Equity**

64. The COD of the transmission asset is 1.4.1992. The debt-equity ratio as on COD was 50:50. The useful life of the transmission asset is 29 years. Thus, the transmission asset completes its useful life on 31.3.2021. First proviso to Regulation 18(3) of the 2019 Tariff Regulations provides that in case of a transmission asset 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;*

65. The equity deployed is more than 30% in respect of the transmission asset as on 1.4.2019. Therefore, as per the first proviso to Regulation 18(3) of the 2019 Tariff Regulations, equity with effect from 1.4.2021 onwards has been restricted to 30%. Accordingly, the equity as on 1.4.2022 is allowed as follows:

		(₹ in lakh)
	<b>Particulars</b>	<b>Amount</b>
A	Closing equity as on 31.3.2020*	11674.48
B	Closing equity as on 31.3.2021**	11933.45
C	Equity in excess of 30% of Capital Cost	4477.31
D	Equity admissible as on 1.4.2021*** (B)-(C)	7456.14

\* Represents 48.87% of Capital Cost of ₹23889.19 lakh

\*\* Represents 48.01% of Capital Cost of ₹24853.81 lakh

\*\*\* Represents 30.00% of Capital Cost of ₹24853.81 lakh

## **Debt-Equity ratio**

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



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

Provided that:

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

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

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

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

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

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

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

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



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

67. Total Debt in Gross Capital Structure has already been repaid before 01.04.2019. Therefore, gross debt appearing in capital structure is dormant. The debt(dormant)-equity for the 2019-24 tariff period as follows:

Debt-Equity for Capital Cost as on 1.4.2019

Funding	Capital Cost (as on 1.4.2019) (₹ in lakh)	(in %)
Debt	12214.70**	51.13
Equity	11674.48	48.87
<b>Total</b>	<b>23889.18</b>	<b>100.00</b>

\*\*Repaid prior to 1.4.2019

Debt-Equity for ACE and De-capitalisation during 2019-24

(₹ in lakh)

Funding	ACE		De-Capitalisation		ACE		De-Capitalisation	
	2020-21	(in %)	2020-21	(in %)	2021-22	(in %)	2021-22	(in %)
Debt	781.70	70.00	76.05	50.00	1124.90	70.00	217.59	70.00
Equity	335.01	30.00	76.05	50.00	482.10	30.00	93.25	30.00
<b>Total</b>	<b>1116.71</b>	<b>100.00</b>	<b>152.09</b>	<b>100.00</b>	<b>1607.00</b>	<b>100.00</b>	<b>310.83</b>	<b>100.00</b>

(₹ in lakh)

Funding	ACE		De-Capitalisation		ACE		De-Capitalisation	
	2022-23	(in %)	2022-23	(in %)	2023-24	(in %)	2023-24	(in %)
Debt	842.26	70.00	194.19	70.00	1236.49	70.00	74.19	70.00
Equity	360.97	30.00	83.23	30.00	529.93	30.00	31.79	30.00
<b>Total</b>	<b>1203.23</b>	<b>100.00</b>	<b>277.42</b>	<b>100.00</b>	<b>1766.42</b>	<b>100.00</b>	<b>105.98</b>	<b>100.00</b>

Debt-Equity for Capital Cost as on 31.3.2024

68. The transmission asset has completed its useful life in 2020-21. Equity from 2021-22 onwards has been restricted to 30% as per proviso to Regulation 18(3) of the 2019 Tariff Regulations. Accordingly, Debt (Dormant)-Equity as on 31.3.2024 will be as follows:



Funding	Capital Cost as on 1.4.2019		Capital Cost as on 1.4.2020		Add-cap/ De-cap during 2020-21				Capital Cost as on 1.4.2021	
	₹ in lakh	in %	₹ in lakh	in %	ACE		De-Capitalisation		₹ in lakh	in %
					₹ in lakh	in %	₹ in lakh	in %		
Debt	12214.70	51.13	12214.70	51.13	781.70	70.00	76.05	50.00	12920.35	51.99
Equity	11674.48	48.87	11674.48	48.87	335.01	30.00	76.05	50.00	11933.44	48.01
<b>Total</b>	<b>23889.18</b>	<b>100.00</b>	<b>23889.18</b>	<b>100.00</b>	<b>1116.71</b>	<b>100.00</b>	<b>152.10</b>	<b>100.00</b>	<b>24853.79</b>	<b>100.00</b>

**Note:** No Add cap / De cap during 2019-20

Funding	Capital Cost as on 1.4.2021 after Equity restriction		Add-cap/ De-cap during 2021-22				Capital Cost as on 1.4.2022 after Equity restriction	
	₹ in lakh	in %	ACE		De-Capitalisation		₹ in lakh	in %
			₹ in lakh	in %	₹ in lakh	in %		
Debt	12920.35	51.99	1124.90	70.00	217.59	70.00	13827.66	52.88
Restricted Equity @30%	7456.14	30.00	482.10	30.00	93.25	30.00	7844.99	30.00
Excess Equity	4477.30						4477.30	
<b>Total</b>	<b>24853.79</b>	<b>81.99</b>	<b>1607.00</b>	<b>100.00</b>	<b>310.84</b>	<b>100.00</b>	<b>26149.95</b>	<b>82.88</b>

Funding	Add/ De-cap during 2022-23				Capital Cost as on 1.4.2023 after Equity restriction		Add/ De-cap during 2023-24			
	ACE		De-Capitalisation		₹ in lakh	in %	ACE		De-Capitalisation	
	₹ in lakh	in %	₹ in lakh	in %			₹ in lakh	in %	₹ in lakh	in %
Debt	842.26	70.00	194.19	70.00	14475.73	53.46	1236.49	70.00	74.19	70.00
Restricted Equity @ 30%	360.97	30.00	83.23	30.00	8122.73	30.00	529.93	30.00	31.79	30.00
Excess Equity					4477.30					
<b>Total</b>	<b>1203.20</b>	<b>100.00</b>	<b>277.42</b>	<b>100.00</b>	<b>27075.76</b>	<b>83.46</b>	<b>1766.42</b>	<b>100.00</b>	<b>105.98</b>	<b>100.00</b>

Funding	Capital Cost as on 31.3.2024 after Equity restriction	
	₹ in lakh	in %
Debt	15638.03	54.42
Restricted Equity @ 30%**	8620.86	30.00
Excess Equity	4477.30	
<b>Total</b>	<b>28736.20</b>	<b>84.42</b>

\*\*Equity to be serviced as on 31.3.2024 is ₹8620.87 lakh (Equity in excess of 30% reduced as discussed above)

### **Depreciation**

69. 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.”*

70. The depreciation has been worked out considering the admitted capital expenditure as on 31.3.2019 and accumulated depreciation up to 31.3.2019. The transmission asset has already completed more than 12 years before 1.4.2019. Accordingly, depreciation has been calculated based on the remaining depreciable value (up to 90% of existing gross block of the transmission asset) to be recovered over the balance useful life. However, depreciation for ACE (new additions) allowed during fag end of the transmission asset has been computed at normative rate of depreciation as specified in the 2019 Tariff Regulations:

(₹ in lakh)					
<b>A. Existing Assets</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Opening Gross Block	23889.19	23889.19	23737.10	23426.27	23148.85
ACE	0.00	0.00	0.00	0.00	0.00
Decapitalisation	0.00	152.09	310.83	277.42	105.98





Closing Gross Block	23889.19	23737.10	23426.27	23148.85	23042.87
Average Gross Block	23889.19	23813.15	23581.69	23287.56	23095.86
Freehold Land	62.67	62.67	62.67	62.67	62.67
Weighted average rate of Depreciation (WAROD) (in %)	1.68	1.69	N/A	N/A	N/A
Depreciable Value	21443.87	21306.99	21027.24	20777.56	20682.18
Cumulative Depreciation at the Beginning of the year	21043.49	21306.99	21027.24	20777.56	20682.18
Less: Dep adjustment on a/c of decapitalisation	0.00	136.88	279.75	249.68	95.38
Balance useful life of the asset (years)	2	1	0	0	0
Lapsed life (years)	27	28	29	29	29
<b>Depreciation</b>	<b>400.38</b>	<b>400.38</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Remaining Depreciable Value at the end of the year	400.38	0.00	0.00	0.00	0.00

(₹ in lakh)

<b>B. New Assets</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Opening Gross Block	0.00	0.00	1116.71	2723.71	3926.94
Additional Capitalisation	0.00	1116.71	1607.00	1203.23	1766.42
Closing Gross Block	0.00	1116.71	2723.71	3926.94	5693.36
Average Gross Block	0.00	558.36	1920.21	4337.62	6834.74
Weighted average rate of Depreciation (WAROD) (in %)	0.00	5.28	5.28	5.28	5.28
Depreciable Value	0.00	502.52	1728.19	2992.79	4329.14
Cumulative Depreciation at the beginning of the year	0.00	0.00	29.48	130.87	306.45
<b>Depreciation</b>	<b>0.00</b>	<b>29.48</b>	<b>101.39</b>	<b>175.58</b>	<b>253.98</b>
Cumulative Depreciation at the end of the year	0.00	29.48	130.87	306.45	560.42
Remaining Depreciation recoverable at the end of the year	0.00	473.04	1597.32	2686.35	3768.71

**Total Depreciation (Existing and New Assets)**

(₹ in lakh)

Existing Assets (A)	400.38	400.38	0.00	0.00	0.00
New Assets (B)	0.00	29.48	101.39	175.58	253.98
<b>Total Depreciation (A+B)</b>	<b>400.38</b>	<b>429.86</b>	<b>101.39</b>	<b>175.58</b>	<b>253.98</b>

**Interest on Loan (IoL)**

71. The Petitioner has not claimed IoL for the 2019-24 tariff period.

**Return on Equity (RoE)**

72. 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 cutoff date beyond the original scope, excluding additional capitalization on account of emission control system, shall be computed at the weighted average rate of interest on actual loan portfolio of the generating station or the transmission system or in the absence of actual loan portfolio of the generating station or the transmission system, the weighted average rate of interest of the generating company or the transmission licensee, as the case may be, as a whole shall be considered, subject to ceiling of 14%;

Provided further that:

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

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

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

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

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

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

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



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

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

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

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

#### **Illustration-**

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

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

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

- (a) Estimated Gross Income from generation or transmission business for FY 2019-20 is Rs 1,000 crore;
- (b) Estimated Advance Tax for the year on above is Rs 240 crore;
- (c) Effective Tax Rate for the year 2019-20 = Rs 240 Crore/Rs 1000 Crore = 24%;
- (d) Rate of return on equity =  $15.50 / (1 - 0.24) = 20.395\%$ .

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



73. The Petitioner has submitted that MAT rate is applicable to the Petitioner's company.

74. The transmission asset will complete its useful life in 2020-21. Equity from 2021-22 onwards has been restricted to 30% as per proviso to Regulation 18(3) of the 2019 Tariff Regulations. The MAT rate applicable in 2019-20 has been considered for the purpose of RoE, which shall be trued-up with actual tax rate in accordance with Regulation 31(3) of the 2019 Tariff Regulations. RoE allowed for the transmission asset is as follows:

(₹ in lakh)					
Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
Opening Equity	11674.48	11674.48	11933.45	7844.99	8122.74
Equity in excess of 30% removed	0.00	0.00	4477.31	0.00	0.00
Opening Equity	11674.48	11674.48	7456.14	7844.99	8122.74
Additions	0.00	335.01	482.10	360.97	529.93
Decrease due to decapitalisation during the period	0.00	76.05	93.25	83.23	31.79
Closing Equity	11674.48	11933.45	7844.99	8122.74	8620.87
Average Equity	11674.48	11803.97	7650.57	7983.87	8371.80
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
<b>Return on Equity</b>	<b>2192.70</b>	<b>2217.02</b>	<b>1436.93</b>	<b>1499.53</b>	<b>1572.39</b>

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

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

Transmission lines				
Sl. No.	Name of Line	Single Circuit / Double Circuit	Number of Sub-Conductors	Line Length Km
1	Korba-Korba(W)	Single Circuit	2	14.000
2	Korba-Bhilai I	Single Circuit	2	197.000
3	Korba-Bhilai II	Single Circuit	2	192.000
4	Bhilai-Koradi	Single Circuit	2	272.000
5	Koradi-Satpura	Single Circuit	2	149.000
6	Satpura-Itarsi	Single Circuit	2	79.000



7	Itarsi-Indore II	Single Circuit	2	214.000
8	Indore-Asoj I	Single Circuit	2	289.000
9	Korba-Bhilai III (Now Korba-Sipat-Raipur-Bhilai)	Single Circuit	2	211.000
10	Bhilai-Bhadravati And Raipur-Bhadrawati I	Double Circuit	2	322.000
11	Bhadravati-Chandrapur Ckt I and II	Double Circuit	2	20.000

Sl. No.	Sub-station 400 kV one number each
1	Indore:Itarsi 2
2	Indore:Asoj 1
3	Bhilai Sub-station:Korba I
4	Bhilai Sub-station:Korba II
5	Bhilai Sub-station:Koradi
6	Koradi:Bhilai
7	Koradi:Satpura
8	Itarsi:Indore 2
9	Itarsi:Satpura
10	Satpura Sub-station:Itarsi
11	Satpura Sub-station:Koradi
12	Asoj:Indore I
13	Bhilai Sub-station:Korba - III(Raipur)
14	Bhilai Sub-station:Bhadravati I
15	Bhilai Sub-station:Bhadravati II (Raipur)
16	Chandrapur:Bhadravati I
17	Chandrapur:Bhadravati II
18	Bhadrawati:Bhilai I
19	Bhadrawati:Bhilai II (Raipur)
20	Bhadrawati:Chandrapur I
21	Bhadrawati:Chandrapur II
22	Bhadrawati:HVDC I
23	Bhadrawati:HVDC II

O&M Expenses					
	2019-20	2020-21	2021-22	2022-23	2023-24
<b>Sub-station</b>					
400 kV					
Number of bays	23	23	23	23	23
<b>Transmission lines</b>					
S/C Twin/Triple Conductor (km)	1617.00	1617.00	1617.00	1617.00	1617.00
D/C Twin/Triple Conductor (km)	342.00	342.00	342.00	342.00	342.00
<b>PLCC</b>					
Original project cost (₹ in lakh)	139.43	139.43	139.43	139.43	139.43
<b>Total O&amp;M Expenses (₹ in lakh)</b>	<b>1856.90</b>	<b>1922.58</b>	<b>1989.56</b>	<b>2059.39</b>	<b>2132.11</b>



76. The norms specified under Regulation 35(3)(a) of the 2019 Tariff Regulations provides that:

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

<b>Particulars</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
<b>Norms for sub-station Bays (₹ Lakh per bay)</b>					
765 kV	45.01	46.60	48.23	49.93	51.68
400 kV	32.15	33.28	34.45	35.66	36.91
220 kV	22.51	23.30	24.12	24.96	25.84
132 kV and below	16.08	16.64	17.23	17.83	18.46
<b>Norms for Transformers (₹ Lakh per MVA)</b>					
765 kV	0.491	0.508	0.526	0.545	0.564
400 kV	0.358	0.371	0.384	0.398	0.411
220 kV	0.245	0.254	0.263	0.272	0.282
132 kV and below	0.245	0.254	0.263	0.272	0.282
<b>Norms for AC and HVDC lines (₹ Lakh per km)</b>					
Single Circuit (Bundled Conductor with six or more	0.881	0.912	0.944	0.977	1.011
Single Circuit (Bundled conductor with four sub-	0.755	0.781	0.809	0.837	0.867
Single Circuit (Twin & Triple	0.503	0.521	0.539	0.558	0.578
Single Circuit (Single	0.252	0.260	0.270	0.279	0.289
Double Circuit (Bundled conductor	1.322	1.368	1.416	1.466	1.517
Double Circuit (Twin & Triple	0.881	0.912	0.944	0.977	1.011
Double Circuit (Single	0.377	0.391	0.404	0.419	0.433
Multi Circuit (Bundled Conductor with four or	2.319	2.401	2.485	2.572	2.662
Multi Circuit (Twin & Triple	1.544	1.598	1.654	1.713	1.773
<b>Norms for HVDC stations</b>					
HVDC Back-to-Back stations (Rs Lakh per 500	834	864	894	925	958
Gazuwaka HVDC Back-to-Back station (₹ Lakh	1,666	1,725	1,785	1,848	1,913
500 kV Rihand-Dadri HVDC bipole scheme	2,252	2,331	2,413	2,498	2,586
±500 kV Talcher- Kolar HVDC bipole scheme	2,468	2,555	2,645	2,738	2,834
±500 kV Bhiwadi-Balia HVDC bipole scheme	1,696	1,756	1,817	1,881	1,947
±800 kV, Bishwanath-Agra HVDC bipole	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  $\pm 500$  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  $\pm 500$  kV Talchar-Kolar HVDC bi-pole scheme (2000 MW);*

*iv. the O&M expenses of  $\pm 800$  kV Champa-Kurukshetra HVDC bi-pole scheme (3000 MW) shall be on the basis of the normative O&M expenses for  $\pm 800$  kV, Bishwanath-Agra HVDC bi-pole scheme;*

*v. the O&M expenses of  $\pm 800$  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  $\pm 800$  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.*

**(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.”*

77. We have considered the submissions of the Petitioner. The Petitioner has claimed O&M Expenses separately for the PLCC under Regulation 35(4) of the 2019 Tariff Regulations @ 2% of its original project cost in the instant petition and 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 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.

78. We have considered the submissions of the Petitioner. The O&M Expenses have been worked out as per the norms specified in the 2019 Tariff Regulations and the same is as follows:

(₹ in lakh)					
Details	2019-20	2020-21	2021-22	2022-23	2023-24
23 Numbers of 400 kV Sub-station bays	739.45	765.44	792.35	820.18	848.93
1617.00 km S/C Twin/Triple Conductor transmission line	813.35	842.46	871.56	902.29	934.63
342.00 km D/C Twin/Triple Conductor transmission line	301.30	311.90	322.85	334.13	345.76
<b>Total</b>	<b>1854.10</b>	<b>1919.80</b>	<b>1986.76</b>	<b>2056.60</b>	<b>2129.32</b>

**Interest on Working Capital (IWC)**

79. Regulation 34(1)(c), Regulation 34(3), Regulation 34(4) and Regulation 3(7) of the 2019 Tariff Regulations specify 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;”*

80. The Petitioner has submitted that it has computed IWC for 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%.

81. IWC is worked out in accordance with Regulation 34 of the 2019 Tariff Regulations. The rate of IWC considered is 12.05% (SBI 1-year MCLR applicable as on 1.4.2019 of 8.55% plus 350 basis points) for 2019-20, 11.25% (SBI 1-year MCLR applicable as on 1.4.2020 of 7.75% plus 350 basis points) for 2020-21 and for 2021-22 onwards, same has been considered as 10.50% (SBI 1-year MCLR applicable as on 1.4.2021 of 7.00% plus 350 basis points). The components of the working capital and interest allowed thereon for the transmission asset is as follows:

	(₹ in lakh)				
<b>Particulars</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
WC for O&M Expenses (Equivalent to annualized O&M Expenses for 1 month)	154.51	159.98	165.56	171.38	177.44
WC for Maintenance Spares (Equivalent to 15% of O&M Expenses)	278.12	287.97	298.01	308.49	319.40
WC for Receivables (Equivalent to 45 days of annual transmission charges)	561.51	577.23	446.38	472.40	499.21
<b>Total Working Capital</b>	<b>994.14</b>	<b>1025.19</b>	<b>909.96</b>	<b>952.27</b>	<b>996.05</b>
Rate of Interest (in %)	12.05	11.25	10.50	10.50	10.50
<b>Interest on Working Capital</b>	<b>119.79</b>	<b>115.33</b>	<b>95.55</b>	<b>99.99</b>	<b>104.59</b>





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

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

	(₹ in lakh)				
<b>Particulars</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
Depreciation	400.38	429.86	101.39	175.58	253.98
Interest on Loan	0.00	0.00	0.00	0.00	0.00
Return on Equity	2192.70	2217.02	1436.93	1499.53	1572.39
O & M Expenses	1854.10	1919.80	1986.76	2056.60	2129.32
Interest on Working Capital	119.79	115.33	95.55	99.99	104.59
<b>Total</b>	<b>4566.98</b>	<b>4682.02</b>	<b>3620.62</b>	<b>3831.70</b>	<b>4060.27</b>

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

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

84. We have considered the submissions of the Petitioner. Regulation 70(1) of the 2019 Tariff Regulations provides for reimbursement of filing fees and publication paid by the Petitioner. Accordingly, the Petitioner is 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**

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

### **Goods and Services Tax**

86. 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

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

### **Security Expenses**

88. The Petitioner has submitted that security expenses for the transmission asset are not claimed in the instant petition and it would file a separate petition for claiming the overall security expenses and the consequential IWC. The Petitioner has requested to consider the actual security expenses incurred during 2018-19 for claiming estimated security expenses for 2019-20 which shall be subject to true up at the end of the year based on the actuals. The Petitioner has submitted that similar petition for security expenses for 2020-21, 2021-22, 2022-23 and 2023-24 shall be filed on a yearly basis on the basis of the actual expenses of previous year subject to true up at the end of the year on actual expenses. The Petitioner has submitted that the difference, if any, between the estimated security expenses and actual security expenses as per the audited accounts may be allowed to be recovered from the beneficiaries on a yearly basis.

89. We have considered the submission 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**

90. 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**

91. 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.



92. To summarise:

i) The revised Annual Fixed Charges approved for the 2001-04 and 2004-09 tariff periods in respect of the transmission asset as per the APTEL's judgements are as follows:

(₹ in lakh)

Particulars	2001-02	2002-03	2003-04
AFC	2978.54	3010.11	2789.43

(₹ in lakh)

Particulars	2004-05	2005-06	2006-07	2007-08	2008-09
AFC	3253.93	3304.64	3358.82	3411.76	3471.03

ii) The consequential revision of Annual Fixed Charges approved for the 2009-14 tariff period are as follows:

(₹ in lakh)

Particulars	2009-10	2010-11	2012-13	2013-14	2014-15
AFC	4692.03	4918.54	5048.36	5184.86	5362.98

iii) The trued-up Annual Fixed Charges approved for the 2014-19 tariff period are as follows:

(₹ in lakh)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
AFC	5159.68	5252.12	5334.91	5419.76	5514.46

iv) The Annual Fixed Charges allowed for the 2019-24 tariff period in this order are as follows:

(₹ in lakh)

Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
AFC	4566.98	4682.02	3620.62	3831.70	4060.27

93. This order disposes of Petition No. 317/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

