

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 256/TT/2013**

**Coram:**

**Shri Gireesh B. Pradhan, Chairperson  
Shri A. K. Singhal, Member**

**Date of Hearing : 25.3.2014**

**Date of Order : 18.5.2015**

**In the matter of:**

Determination of tariff in respect of Maharashtra State Electricity Transmission Company Limited (MSETCL) owned Transmission Lines/System conveying electricity to other States as per Central Electricity Regulatory Commission's order dated 14.3.2012 against Petition No 15/SM/2012, for inclusion in the PoC transmission charges in accordance with Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009.

**And in the matter of:**

Maharashtra State Electricity Transmission Company Limited,  
'Prakashganga', Plot No. C-19, E Block,  
Bandra Kurla Complex, Bandra(East),  
Mumbai- 400051

.....**Petitioner**

**Vs**

1. Power Grid Corporation of India Limited,  
"Saudamani", Plot No.2,  
Sector-29, Near IFFCO Chowk,  
Gurgaon -122001 (Haryana).
2. M.P. Power Transmission Company Limited,  
Block No-2, Shakti Bhawan,  
Rampur, Jabalpur, 482008,  
Madhya Pradesh
3. Gujarat Energy Transmission Corporation Limited.  
Sardar patel Vidyut Bhavan, Race Course,  
Vadodara-390007, Gujarat
4. Electricity Department, Goa,  
Vidyut Bhavan, 3<sup>rd</sup> Floor,  
Tiswadi, Panaji-403001.
5. Karnataka Power Transmission Corporation Limited,  
Kaveri Bhavan, K.G Road,  
Bangalore-560009, Karnataka

.....**Respondents**



**For petitioner** : Shri M.C Walke, MSETCL  
Shri Santosh Kumar Singh, MSETCL

**For respondent** : None

### ORDER

The instant petition has been filed by Maharashtra State Electricity Transmission Company Limited (MSETCL) for approval of the annual transmission charges of the transmission lines/systems conveying electricity to other States under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter "2009 Tariff Regulations") in compliance of Commission's order dated 14.3.2012 in Petition No. 15/SM/2012.

2. The Commission vide order dated 14.3.2012 in Petition No. 15/SM/2012 gave the following directions:-

"5. It has come to the notice of the Central Commission that the some of the owners/developers of the inter-State transmission lines of 132 kV and above in North Eastern Region and 220 kV and above in Northern, Eastern, Western and Southern regions as mentioned in the Annexure to this order have approached the Implementing Agency for including their transmission assets in computation of Point of Connection transmission charges and losses under the Central Electricity Regulatory Commission (Sharing of inter-State Transmission Charges and Losses) Regulations, 2010 (hereinafter "Sharing Regulations").

6. As a first step towards inclusion of non-ISTS lines in the POC transmission charges, the Commission proposes to include the transmission lines connecting two States, for computation of POC transmission charges and losses. However, for the disbursement of transmission charges, tariff for such assets needs to be approved by the Commission in accordance with the provisions of Sharing Regulations. Accordingly, we direct the owners of these inter-State lines to file appropriate application before the Commission for determination of tariff for facilitating disbursement.

7. We direct the respondents to ensure that the tariff petitions for determination of tariff is filed by the developers/owners of the transmission line or by State Transmission Utilities where the transmission lines are owned by them in accordance with the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009, by 20.4.2012."

3. Nine transmission lines of MSETCL were identified as inter-State transmission lines, on the basis of the inputs provided by Western Regional Power Committee (WRPC). MSETCL was directed to file tariff petition for the nine transmission lines (given in the table below) for the purpose of inclusion in the POC charges, vide order dated 14.3.2012 in Petition No.15/SM/2012. Accordingly, the petitioner has claimed transmission charges for the nine transmission lines given in the table below. The petitioner has further submitted that 220 kV TAPS-Vapi (Maharashtra-Gujarat) and 220 kV TAPS-Bhilad line (Maharashtra-Gujarat) are owned by Gujarat Energy Transmission Corporation Ltd. and hence these two lines are not included in the instant petition.

Sl. No.	Name of the inter-State Line	Connecting States	Date of commercial operation
1	220 kV S/C Kalmeshwar-Pandurna line	Maharashtra-M.P	4.11.1998
2	220 kV S/C Mudshingi-Amona line	Maharashtra-Goa	22.6.1981
3	220 kV S/C Tillari-Amona-2 line	Maharashtra-Goa	11.1.1978
4	220 kV D/C Nasik-Navsari-1 line	Maharashtra-Gujarat	31.5.1977
5	220 kV D/C Nasik-Navsari-2 line	Maharashtra-Gujarat	28.1.1989
6	220 kV S/C Kolhapur-Chikkodi ckt-1 line	Maharashtra-Karnataka	1.11.1970
7	220 kV S/C Kolhapur-Chikkodi ckt-2 line	Maharashtra-Karnataka	1.11.1970
8	400 kV S/C SSP-Dhule ckt-1 line	Maharashtra-Gujarat	13.12.1998
9	400 kV S/C SSP-Dhule ckt-2 line	Maharashtra-Gujarat	22.12.1998

4. The petitioner has submitted that all the transmission lines have been commissioned before the financial year 1990 and accurate capital cost of these transmission lines is not available. The petitioner has submitted that it has considered the following three options to arrive at the appropriate capital cost of these lines:-

- (a) **Option 1:-** Indicative per km costs available in the CERC document titled "Assumptions in Computation in PoC charges and Losses for 2012-13;
- (b) **Option 2:-** Historic MSETCL costs; and
- (c) **Option 3:-** Recent MSETCL costs.

As regards the Option 1, the petitioner has submitted that in Central Electricity Regulatory Commission (Sharing of inter-State Transmission Charges and Losses) Regulations, 2010 and the Statement of Reasons for the said Regulations, indicative cost have been provided only for the purpose of sharing inter-State transmission charges among ISTS beneficiaries and they are not benchmark cost. As regards Option 2, the petitioner has stated that the actual capital cost and additional capital cost incurred for the assets are not available. The petitioner has gathered the cost from old manual records maintained by its field offices. However, the cost was found to be inaccurate as the erstwhile MSETCL did not have robust systems, processes and accounting standards for accurate recording of asset wise original capital expenditure, capitalisation of initial spares, additional capital expenditure post commissioning date and capitalisation of investments incurred on renovation and modernization of assets. As regards Option 3, the petitioner has submitted that it has arrived at per km capital cost figures of ₹40.41 lakh and ₹49.35 lakh per km for 220 kV S/C line and 220 kV D/C lines respectively using capital cost of recently commissioned transmission lines owned by MSETCL. The petitioner has submitted that these estimates being its own, the capital costs may be viewed as more representative than the cost estimates of CTU or any other transmission utility. The petitioner has also submitted that these old lines are delivering good operational performance (e.g. availability) similar to other new lines and this could not have been possible without incurring significant capital expenditure on R&M of these old lines. The Petitioner has arrived at the following per km capital cost figures using approved cost data for the 220 kV and 400 kV transmission lines:-

Particulars	MSETCL Cost Data (₹ in lakh/km)	Considered in this Petition (₹ in lakh/km)
220 kV S/C line on D/C Towers ACSR conductor for FY 12 and FY13	40.41	40.41
220 kV D/C line on D/C Towers for FY 12 and FY13 using ACSR conductor	49.35	49.35
400 kV D/C line on D/C Towers for FY11 Twine AAAC conductor	129.59	129.59
220 kV D/C line on D/C Towers for FY 12 and FY13 using 0.5ACSR Moose conductor	Re computed based on Cost data of MSETCL*	57.08
400 kV D/C line on D/C Towers for FY 11 using 0.5ACSR Moose conductor	Re computed based on Cost data of MSETCL <sup>§</sup>	133.00

\* 220 kV Nasik-Navsari D/C line (Mh.-Gujarat),

§ 400 kV SSP-Dhule D/C (Mh.-Gujarat)

5. The petitioner further submitted that the above mentioned costs are the estimates done by the petitioner itself for the purpose of the determination of tariff. These old lines are delivering good operational parameters similar to other new lines and this would not have been possible without incurring capital expenditure on R&M. The summary of the capital cost and other technical parameters considered by the petitioner for these lines based on the capital cost considered based on Option 3 are given below:-

S. No.	Name of the lines	line length (ckt km)	capital cost (₹. lakh)	Remarks (ownership with MSETCL )
1	220 kV Kamleshwar-Pandurna S/C line (Maharashtra -M.P.)	33.8	1,365.86	33.8 km
2	220 kV Mudshingi-Amona S/C line (Maharashtra -Goa)	182.0	444.15	18 km
3	220 kV Tillari-Amona-2 S/C line (Maharashtra -Goa)	41.0	929.07	30 km
4	220 kV Nasik-Navsari D/C line (Maharashtra -Gujarat)	171.2	2,853.79	100 km
5	220 kV Nasik-Navsari-2 D/C line (Maharashtra -Gujarat)	171.2	2,853.79	100 km
6	220 kV Kolhapur-Chikkodi ckt-1 S/C line (Maharashtra-Karnataka)	56.0	730.00	15.41 km
7	220 kV Kolhapur (Mudshingi)-Chikkodi ckt-2 S/C line (Maharashtra -Karnataka)	64.0	1,077.12	24 km
8	400 kV SSP-Dhule ckt-1 S/C line (Maharashtra -Gujarat)	236.0	9,443.00	142 km
9	400 kV SSP-Dhule ckt-2 S/C line (Maharashtra -Gujarat)	236.0	9,443.00	142

6. No comments or suggestions have been received from the general public in response to the notice published by the petitioner under Section 64 of the Electricity Act, 2003 (the Act). None of the respondents have filed any reply to the petition.

7. We have heard the representative of the petitioner and have perused the material on record. We proceed to determine the annual fixed charges in respect of the assets covered in the petition. Having heard the representatives of the parties and perused the material on record, we proceed to dispose of the petition.

8. The petitioner was directed vide ROP dated 25.3.2014 to furnish the capital cost, funding pattern of the assets, repayment schedule and interest rates, cumulative depreciation and the details of the ARR approved by the MERC. Besides this, the CTU was directed to provide the latest available indicative cost for the types of line as claimed by the petitioner.

9. In response, the petitioner vide affidavit dated 9.5.2014, has submitted that accurate capital cost figures are not available and the same has already been submitted in the petition. The petitioner further submitted that the ARR for the instant nine transmission assets was approved by the MERC for the financial years 2009-10 to 2013-14 and the details submitted by the petitioner are as follows:-

(lines in ckt. Km. & ₹ in lakh)

Line Type	2009-10	2010-11	2011-12	2012-13	2013-14
500 kV HVDC	1,504	1,504	1,504	1,504	1,504
800 kV HVDC	N.A.	N.A.	N.A.	N.A.	N.A.
765 kV D/C	N.A.	N.A.	N.A.	N.A.	N.A.
765 kV S/C	N.A.	N.A.	N.A.	N.A.	N.A.
400 kV	6,562.13	6,816.393	7,186.59	7,348	7,468
220 kV	12,356.5	12,567.912	13,217.98	13,978	14,597
132 kV	11,064.5	11,525.6	12,176.08	12,869	13,304
110 kV	1,697.9	1,698.5	1,722.48	1,722	1,737
100 kV	678	685.87	685.87	686	686
66 kV	3,270	3,270	3,270	3,281	3,281
<b>ARR Approved by MERC**</b>	<b>1,882.46</b>	<b>2,715.03</b>	<b>3,393.15</b>	<b>4,474.89</b>	<b>4,200.05</b>

10. CTU has submitted, vide letter dated 12.5.2014, the indicative cost of the various transmission lines at February, 2014 price level:-

Sl. No.	Line type	₹ (in lakh)/Km
1	+/-500 kV HVDC	158
2	+/-800 kV HVDC	346
3	765 kV D/c	450
4	765 kV S/c	180
5	400 kV D/c	135
6	400 kV D/C Quad Moose	240
7	400 kV S/c	88
8	220 kV D/c	56
9	220 kV D/c	35
10	132 kV S/c	44
11	132 kV S/c	28
12	66 kV D/c	30

### **Procedure for calculating YTC for the nine transmission lines**

11. As the petitioner has submitted that the capital costs of the transmission lines are not available, the indicative cost of lines of various configurations owned and operated by PGCIL has been considered for the purpose of computation of capital cost. Indicative cost of 400 kV D/C Quad Moose transmission line has been taken as base and indicative cost of lines with configurations other than 400 kV D/C Quad Moose have been made equivalent to indicative cost of 400 kV D/C Quad Moose (i.e. by dividing indicative cost of the 400 kV D/C Quad Moose line by the indicative cost of line of other configurations).

For example – the indicative cost of 400 kV D/C Quad Moose is `202 lakh/km (cost/ckt km=`101 lakh) and of 765 kV S/C is `159.25 lakh/km. Therefore, the ratio of indicative cost of ckt km of 400 kV D/C Quad Moose and indicative cost of ckt km of 765 kV S/C is 0.63 (i.e.101/159.25) and so on for other configurations.

Further, the petitioner also owns lines of 110 kV, 100 kV and 66 kV level but the indicative cost data provided by the CTU is for voltage level up to 132 kV level. Therefore, we have added line length of 110 kV, 100 kV and 66 kV level to 132 kV level and considered the

indicative cost of 132 kV level as indicative cost for all the transmission lines having voltage level 132 kV and below.

The yearly break up is given hereunder:-

**For FY 2013-14:**

Type	Cost (₹ in lakh)*	Cost (₹ in lakh/circuit)	Co-efficient	Ratio w.r.t. (d)
500 kV HVDC	157	157	a	0.74
765 kV D/C	412	206	b	0.57
765 kV S/C	180	180	c	0.65
400 kV D/C Quad Moose	233	116.5	d	1.00
400 kV D/C Twin Moose	130	65	e	1.79
400 kV S/C Twin Moose	87	87	f	1.34
220 kV D/C	61	30.2	g	3.82
220 kV S/C	38	38	h	3.07
132 kV D/C	48	24	i	4.85
132 kV S/C	30	30	j	3.88

**For FY 2012-13:**

Type	Cost (₹ in lakh)*	Cost (₹ in lakh/circuit)	Co-efficient	Ratio w.r.t (d)
500 kV HVDC	152	152	a	0.74
765 kV D/C	357	178.5	b	0.63
765 kV S/C	179	179	c	0.63
400 kV D/C Quad Moose	225	112.5	d	1.00
400 kV D/C Twin Moose	123	61.5	e	1.83
400 kV S/C Twin Moose	84	84	f	1.34
220 kV D/C	68	34	g	3.31
220 kV S/C	41	41	h	2.74
132 kV D/C	53	26.5	i	4.25
132 kV S/C	32	32	j	3.52

**For FY 2011-12:**

Type	Cost (₹ in lakh)*	Cost (₹ in lakh/circuit)	Co-efficient	Ratio w.r.t (d)
500 kV HVDC	134	134	a	0.75
765 kV D/C	315	157.6	b	0.64
765 kV S/C	159	159	c	0.63
400 kV D/C Quad Moose	202	101	d	1.00
400 kV D/C Twin Moose	110	55	e	1.84
400 kV S/C Twin Moose	74	74	f	1.36
220 kV D/C	60	30	g	3.39
220 kV S/C	37	37	h	2.73
132 kV D/C	47	23.5	i	4.32
132 kV S/C	29	29	j	3.54

\*Rounded off.



12. After getting ratio with respect to 400 kV D/C Quad Moose, YTC per ckt. km of 400 kV D/C Quad Moose transmission line has been calculated as follows:

$$\text{YTC per ckt km} = \frac{\text{ARR for FY.....in ₹}}{\left\{ \begin{array}{l} 400 \text{ kV D/C} \\ \text{Quad Moose} \end{array} \right\} \left[ \begin{array}{l} (\text{Length of 500 kV HVDC/a}) + (\text{Length of 765 kV DC/b}) + (\text{Length of 765 kV SC/c}) + (\text{Length of 400 kV DC QM/d}) + (\text{Length of 400 kV DC TM /e}) + (\text{Length of 400 kV SC TM /f}) + (\text{Length of 220 kV DC /g}) + (\text{Length of 220 kV SC /h}) + (\text{Length of 132 kV DC /i}) + (\text{Length of 132 kV SC /j}) \end{array} \right]}$$

\*value of a, b, c, d, e, f, g, h, i & j are as given in para 11 and length in ckt km as given in para 9 above of this order.

DC-Double Circuit, SC-Single Circuit, AM-Quad Moose, TM-Twin Moose

13. We have not carried out any due diligence of the tariff of these lines (for consideration of PoC calculations) as the jurisdiction to determine the tariff of the lines owned by STU rests with the State Regulatory Commission. We have considered the ARR of the STU as approved by the State Regulatory Commission and have adopted the methodology as discussed in paras 11 and 12 of this order for the purpose of calculation of PoC charges and apportionment of transmission lines and charges to the transmission system of different configurations of the STU. This methodology shall be adopted uniformly for the lines owned by other STUs used for inter-State transmission of power duly certified by respective RPCs for the purpose of inclusion in the PoC mechanism.

14. Accordingly, on the basis of the line length in ckt. km and the ARR approved by the State Commission for the years 2009-10, 2010-11, 2011-12, 2012-13 and 2013-14 and PoC cost data for the respective years, YTC for the instant transmission assets for the years 2011-12, 2012-13, 2013-14 have been calculated as given overleaf:-

**For FY 2013-14:**

Total ARR approved by the MERC= ₹42,00,05,00,000

S. No	Asset	For entire system (Maharashtra)		
		Line Length (ckt km)	YTC (₹ Per ckt. km)	YTC
1	500 kV HVDC	1,504	32,79,379.79	4,93,21,87,204
2	400 kV S/C	7,468	18,17,235.93	13,57,11,17,959
3	220 kV S/C	14,597	7,93,735.24	11,58,61,53,236
4	132 kv S/C	19,008	6,26,633.08	11,91,10,41,601
Total				42,00,05,00,000

**For FY 2012-13:**

Total ARR approved by the MERC= ₹44,74,89,00,000

S. No	Asset	For entire system (Maharashtra)		
		Line Length (Ckt. km)	YTC (Per ckt. km)	YTC
1	500 kV HVDC	1,504	33,79,299.02	5,08,24,65,732
2	400 kV S/C	7,348	18,67,507.36	13,72,24,44,048
3	220 kV S/C	13,978	9,11,521.45	12,74,12,46,790
4	132 kV S/C	18558	7,11,431.37	13,20,27,43,429
Total				44,74,89,00,000

**For FY 2011-12:**

Total ARR approved by the MERC= ₹33,93,15,00,000

S. No	Asset	For entire system (Maharashtra)		
		Line Length (ckt. km)	YTC (₹ per ckt. km)	YTC (₹)
1	500 kV HVDC	1,504	26,23,584	3,94,58,71,073
2	400 kV S/C	7,186.59	14,53,740	10,44,74,32,724
3	220 kV S/C	13,217.98	7,24,423	9,57,54,03,215
4	132 kV S/C	17,854.43	5,58,001	9,96,27,92,988
Total				33,93,15,00,000

**YTC of the nine transmission lines**

15. The YTC per ckt km, total ARR for the transmission system in Maharashtra is matching with the ARR approved by the MSETCL is as given overleaf:-

Voltage Level	2011-12	2012-13	2013-14
200 kV S/C	7,24,423	9,11,521	7,93,735
400 kV S/C	14,53,740	18,67,507	18,17,236

16. YTC of the nine transmission lines calculated on the methodology discussed above are as follows:-

S. No.	Name of the lines	Line Length (ckt km)	2011-12	2012-13	2013-14
1	220 kV Kamleshwar-Pandurna S/C line (Maharashtra -M.P.)	33.8	183,64,123	308,09,410	268,28,243
2	220 kV Mudshingi-Amona S/C line (Maharashtra -Goa)	18	97,79,711	164,07,378	142,87,230
3	220 kV Tillari-Amona-2 S/C line (Maharashtra -Goa)	30	162,99,518	273,45,630	238,12,050
4	220 kV Nasik-Navsari D/C line (Maharashtra -Gujarat)	100	543,31,725	911,52,100	793,73,500
5	220 kV Nasik-Navsari-2 D/C line (Maharashtra -Gujarat)	100	543,31,725	911,52,100	793,73,500
6	220 kV Kolhapur-Chikkodi ckt-1 S/C line (Maharashtra-Karnataka)	15.41	83,72,519	140,46,539	122,31,456
7	220 kV Kolhapur (Mudshingi)-Chikkodi ckt-2 S/C line (Maharashtra -Karnataka)	24	130,39,614	218,76,504	190,49,640
8	400 kV SSP-Dhule ckt-1 S/C line (Maharashtra -Gujarat)	142	1548,23,310	2651,85,994	2580,47,512
9	400 kV SSP-Dhule ckt-2 S/C line (Maharashtra -Gujarat)	142	1548,23,310	2651,85,994	2580,47,512
Total			4841,65,554	8231,61,648	7710,50,643

\*YTC for 9 months has been taken as Sharing Regulations, 2010 came into force from 1.7.2011.

17. The Central Electricity Regulatory Commission (Sharing of inter-State Transmission Charges and Losses) Regulations, 2010 came into force from 1st July, 2011. Therefore, YTC for the lines have been calculated from 1.7.2011 to 31.3.2012, 2012-13 and 2013-14. The revenue received by MSETCL in respect of these assets under the Sharing Regulations shall be excluded/adjusted from the ARR of MSETCL in the transmission tariff petition filed by the petitioner before MERC.

18. The petitioner has sought reimbursement of fee paid by it for filing the petition and publication expenses. The petitioner shall be entitled for reimbursement of the filing fees and publication expenses in connection with the present petition, directly from the beneficiaries on *pro-rata* basis in accordance with Regulation 42 A (1) (a) of the 2009 Tariff Regulations.

19. This order disposes of Petition No. 256/TT/2013.

sd/-  
**(A. K. Singhal)**  
Member

sd/-  
**(Gireesh B. Pradhan)**  
Chairperson