

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 112/TT/2017**

**Coram:**

**Shri A. K. Singhal, Member  
Shri A. S. Bakshi, Member  
Dr. M. K. Iyer, Member**

**Date of Order: 4.5.2018**

**In the matter of:**

Determination of Tariff for the year 2014-15, 2015-16 and 2016-17 in respect of RVPN owned transmission lines/system connecting with other States and intervening transmission lines incidental to inter-State transmission of electricity for Inclusion in the POC transmission charges in accordance with the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations 2014 and Central Electricity Regulatory Commission (Sharing of Transmission Charges and Losses) Regulation, 2010 and its subsequent amendments.

**And in the matter of:**

Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRRVPNL)  
Vidyut Bhawan, Jyoti Nagar,  
Jaipur-302005

.....Petitioner

**Vs**

1. Power Grid Corporation of India Ltd.  
Saudamini, Plot No.2, Sector-29,  
Near IFFCO Chowk,  
Gurgaon, (Haryana) - 122001.
2. Haryana Vidyut Prasaran Nigam,  
Shakti Bhawan, Sector-6,  
Panchkula, (Haryana) – 134109.
3. Haryana Power Purchase Center (HPPC),  
2<sup>nd</sup> Floor, Shakti Bhawan, Sector-6,  
Panchkula, (Haryana) – 134109.
4. M.P Power Transmission Company Ltd.  
Block No.2, Shakti Bhawan, Rampur,



Jabalpur, (Madhya Pradesh) – 482008.

5. MP Power Management Co. Ltd. (MPPMCL),  
Block No.11, 1<sup>st</sup> Floor, Shakti Bhawan, Rampur,  
Jabalpur, (Madhya Pradesh) – 482008.
6. Delhi Transco Ltd.  
Shakti Sadan, Kotla Road,  
New Delhi – 110002.
7. BSES Yamuna Power Ltd.  
BSES Bhawan, Nehru Place,  
New Delhi.
8. BSES Rajdhani Power Ltd,  
BSES Bhawan, Nehru Place,  
New Delhi.
9. North Delhi Power Ltd,  
Power Trading and Load Dispatch Group,  
CENNET Building, Pitampura,  
New Delhi – 110034.
10. UP Power Transmission Corporation Ltd,  
Shakti Bhawan, 14, Ashok Marg,  
Lucknow – 2266001.
11. UP Power Corporation Ltd,  
Shakti Bhawan, 14, Ashok Marg,  
Lucknow – 226001

.....Respondents

**For petitioner** : Shri Pradeep Misra, Advocate, RRVPNL  
Shri R.K Jain, RRVPNL  
Shri Rajeev Jain, RRVPNL

**For respondent** : Shri S.S Raju, PGCIL  
Shri B. Dash, PGCIL  
Shri Rakesh Prasad, PGCIL  
Shri Vivek Kumar Singh, PGCIL  
Shri V.P. Rastogi, PGCIL



## ORDER

Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL) has filed the instant petition for the approval of transmission tariff of the following deemed inter-State transmission lines for the years 2014-15, 2015-16 and 2016-17 for inclusion in computation of point of connection (PoC) transmission charges in accordance with the the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations 2014 (hereinafter referred to as “2014 Tariff Regulations”):-

(1)

Srl. No.	Name of the Line	Voltage Level	Length of Line in ckt-km	COD
1.	Asset-1: 220 kV S/C Chirawa-Hissar line (Rajasthan-Haryana)	220 kV	118.00	27.11.2010
2.	Asset-2: 132 kV S/C Sadulpur (Rajgarh) - Hissar line	132 kV	78.00	3.10.1959
3.	Asset-3: 132 kV S/C Amrapura Thedi- Sirsa line	132 kV	80.00	19.12.1970
4.	Asset-4: 132 kV S/C Khandar-Sheopur line	132 kV	35.24	5.7.2008
5.	Asset-5: 220 kV S/C Anta-Kota Line	220 kV	67.00	1.3.1969
6.	Asset-6: 220 kV SC RAPP (B)-Kota Line	220 kV	42.00	1.9.1977
7.	Asset-7: 220 kV S/C RAPP (B) – RAPP (A) Line	220 kV	2.00	1.9.1977
8.	Asset-8: 220 kV S/C MIA (Alwar)-Badarpur Line	220 kV	131.60	22.11.1975
9.	Asset-9: 220 kV S/C Agra-Bharatpur Line (Rajasthan-Uttar Pradesh)	220 kV	48.12	30.12.1982
10.	Asset-10: 220 kV S/C Kota (Sakatpura)-Badod (Rajasthan-Madhya Pradesh)	220 kV	164.00	20.8.1977
11.	Asset-11: 220 kV S/C Modak-Badod (Rajasthan-Madhya Pradesh)	220 kV	121.00	2.1.1988
12.	Asset-12: 220 kV S/C Khetri-	220 kV	70.91	23.12.1977



	Dadri Line I (Rajasthan-Haryana)			
13.	Asset-13: 220 kV S/C Khetri-Dadri Line II (Rajasthan-Haryana)	220 kV	77.00	2.3.1985
14.	Asset-14: 400 kV S/C Jodhpur-Merta Line-I	400 kV	106.86	15.9.2004
15.	Asset-15: 400 kV S/C Jodhpur-Merta Line-II	400 kV	107.48	27.10.2012
16.	Asset-16: 400 kV S/C Merta-Ratangarh Line	400 kV	172.50	9.5.2008
17.	Asset-17: 400 kV S/C Merta-Heerapura Line	400 kV	178.07	13.7.2004
18.	Asset-18: 220 kV D/C Aau-Baithwasia Line	220 kV	46.63	29.3.2015
19.	Asset-19: 220 kV D/C Baithwasia- Bhawad Line	220 kV	33.03	25.3.2015
20.	Asset-20: 220 kV D/C Gajner-Bikaner (400 kV GSS) Line	220 kV	58.67	22.1.2013

2. RRVPNL has submitted that the present petition is filed in accordance with the Commission's directions in order dated 14.3.2012 in Petition No. 15/Suo-Motu/2012. Earlier, YTC for Assets 8 to 13 from 1.7.2011 to 31.3.2014 was allowed vide order dated 18.3.2015 in Petition No. 213/TT/2013 and YTC for the remaining 14 assets was not granted due to non-availability of NRPC certificate. Later, RRVPNL filed Petition No. 26/TT/2017 claiming tariff for seven ISTS lines for 2011-14 period alongwith the certificate issued by NRPC, which was not allowed by the Commission as it would have led to revision of the POC charges retrospectively. Subsequently, RRVPNL filed Petition No 111/TT/2017 for truing up of YTC allowed in Petition No. 213/TT/2013 vide order dated 18.3.2015 for the following six ISTS transmission lines which was allowed by the Commission vide order dated 9.3.2018:-



<b>Srl. No.</b>	<b>Name of Line</b>	<b>Connecting States</b>	<b>Length (ckt. km)</b>
1	220 kV S/C MIA (Alwar)-Badarpur line	Rajasthan-Delhi	131.6
2	220 kV S/C Agra-Bharatpur line	Rajasthan-Uttar Pradesh	48.12
3	220 kV S/C Kota (Sakatpura)-Badod line	Rajasthan-Madhya Pradesh	164.00
4	220 kV S/C Modak-Badod line	Rajasthan-Madhya Pradesh	121.00
5	220 kV S/C Khetri –Dadri line-I	Rajasthan-Haryana	70.91
6	220 kV S/C Khetri –Dadri line-II	Rajasthan-Haryana	77.00

3. RRVPNL has prayed for approval of YTC for the 20 deemed ISTS lines in the instant petition for 2014-17 period. RRVPNL has enclosed the NRPC letters dated 8.6.2016 and 9.11.2016 with the petition, wherein Assets 5 to 7 and Assets 14 to 20 respectively have been recommended to be considered as deemed ISTS line for the purpose of POC computation. RRVPNL has also submitted the NRPC letter dated 9.11.2016 certifying Assets 1 to 4 as natural ISTS lines and does not require certification from NRPC.

4. RRVPNL has submitted that the tariff claimed in the petition is worked out on the basis of the ARR methodology adopted by the Commission while determining the YTC charges in order dated 18.3.2015 in Petition No. 213/TT/2013 and to approve the YTC claimed for the instant assets as per the procedure adopted by the Commission in the aforementioned order. The details of the YTC claimed for 13 natural inter-State transmission lines for the 2014-17 period, worked out on the basis of the ARR approved by the State Commission are as follows:-



Srl. No.	Name of Transmission Lines	Line Length in km	YTC in ₹		
			2014-15*	2015-16	2016-17
1	220 kV S/C Chirawa-Hissar line (Raj-Har)	118.00	72705684	76741570	73669472
2	132 kV S/C Sadulpur (Rajgarh) - Hissar line	78.00	38447752	40283586	39332006
3	132 kV S/C Amrapura - Sirsa line	80.00	39433591	41316498	40340519
4	132 kV S/C Khandar-Sheopur line	35.24	17370497	18199917	17769999
5	220 kV S/C Anta-Kota Line	67.00	41282041	43573603	41829276
6	220 kV SC RAPP (B)-Kota Line	42.00	25878294	27314796	26221337
7	220 kV S/C RAPP (B) – RAPP (A) Line	2.00	1232300	1300705	1248635
8	220 kV S/C MIA (Alwar) – Badarpur Line	131.6	81085322	85586361	82160190
9	220 kV S/C Agra-Bharatpur Line(Raj-UP)	48.12	29649131	31294952	30042161
10	220 kV S/C Kota (Sakatpura)-Badod (Raj-MP)	164.00	101048578	106657775	102388079
11	220 kV S/C Modak-Badod (Raj-MP)	121.00	74554134	78692627	75542424
12	220 kV S/C Khetri-Dadri Line I (Raj-Haryana)	70.91	43691187	46116481	44270358
13	220 kV S/C Khetri-Dadri Line II (Raj-Haryana)	77.00	47443540	50077126	48072452
<b>TOTAL</b>			<b>613822051</b>	<b>647155997</b>	<b>622886908</b>

\*On the basis of tried-up ARR.

5. RRVPNL has claimed YTC for the remaining 7 transmission lines only for 2016-17 on the basis of the ARR approved by the State Commission and it is as follows:-



Srl. No.	Name of Transmission Lines	Line Length in km	YTC in ₹
			2016-17
1	400 kV S/C Jodhpur - Merta Line -I	106.86	197568532
2	400 kV S/C Jodhpur - Merta Line -II	107.48	198720422
3	400 kV S/C Merta-Ratangarh Line	172.50	318947776
4	400 kV S/C Merta-Heerapura Line	178.07	329240827
5*	220 kV D/C Aau-Baithwasia Line	D/C length 46.63	58220109
		S/C length 2x46.63=93.25	
6*	220 kV D/C Baithwasia-Bhawad Line	D/C length 33.03	41237423
		S/C length 2x33.03=66.05	
7*	220 kV D/C Gajner-Bikaner (400 kV GSS) Line	D/C length 58.67	73261168
		S/C length 2x58.67=117.35	
<b>TOTAL</b>			<b>1217196257</b>

\*Lines at Srl. No. 5, 6, 7 are D/C lines but in ARR, line length has been considered as ckt-km.

6. Uttar Pradesh Power Corporation Limited (UPPCL), Respondent No. 11, has filed its reply vide affidavit dated 19.6.2017. The submissions made by UPPCL are as follows:

- a) Assets 5 to 13 have not been certified by NRPC for usage as ISTS and therefore same may be clarified by the RRVPL.
- b) The YTC claimed by the petitioner should be as per the methodology adopted by the Commission in order dated 18.3.2015 in Petition No. 213/TT/2013.
- c) For calculation purpose, indicative cost of lines of various configurations owned and operated by PGCIL has been taken and the same may be verified before approving such cost of line/ckt km.



d) NRPC certifies the use of STU lines as ISTS on the basis of load follow study and finds the percentage usage of these lines. However, in the instant petition the full YTC of these lines has been claimed by the RRVPNL which is not fair. Further, the percentage use of old lines of STU as ISTS will vary with the load flow duration. Therefore, a compromise has to be struck and 50% of the YTC may be considered for PoC charges.

7. RRVPNL in its rejoinder to the reply filed by UPPCL vide affidavit dated 4.9.2017 has submitted that the NRPC certification in case of Assets 5 to 13 has already been submitted in the petition. NRPC did not provide figures of percentage use of the transmission line declared as ISTS lines.

8. Madhya Pradesh Power Transmission Company Limited (MPPTCL), Respondent No. 4, has submitted its reply vide affidavit dated 29.6.2017 and the issues raised by MPPTCL are as under:-

a) Out of the 20 lines as indicated RRVPNL, three lines are related to MPPTCL, namely 220 kV Badod-Kota line, 220 kV Badod-Modak line and 132 kV Sheopur-Khandar line of MPPTCL (up to MP border). Further, a part of above mentioned 3 Nos. 220 kV/132 kV lines from 220 kV Sub-station Badod and 132 kV Sheopur Sub-station upto the State boundary between Madhya Pradesh and Rajasthan is under the jurisdiction of MPPTCL.

b) YTC charges for 103.920 ckt-km length, each of 220 kV lines namely 220 kV Badod-Kota line, 220 kV Badod-Modak line up to the State boundary has already been approved by the Commission vide its order dated 15.10.2015 for the control





period 2009-10 to 2013-14 in Petition No. 217/TT/2013 filed by MPPTCL. Further, RRVPNL has filed a Petition No. 26/TT/2017 for determination of transmission tariff of 7 lines including 132 kV Sheopur-Khandar line. As the said line is considered as natural ISTS lines by RRVPNL, MPPTCL, has also submitted the reply for inclusion of 35.3 km length of 132 kV Sheopur-Khandar line (132 kV Sheopur Sub-station up to Madhya Pradesh border) in its PoC charges.

c) RRVPNL has claimed transmission tariff for 164.0 ckt-km length of 220 kV Kota-Badod line, 121.0 ckt-km length of 220 kV Modak-Badod line and 35.24 ckt-km Sheopur-Khandar line. Approximately 65 ckt-km length of 220 kV Kota-Badod line, 20 ckt-km of 220 kV Modak- Badod line and 12.262 km of Khandar- Sheopur line from 220 kV Kota Sub-station, 220 kV Modak Sub-station and 132 kV Khandar Sub-station respectively up to Madhya Pradesh-Rajasthan border is under the administrative jurisdiction of RRVPNL and same may be considered for the purpose of calculation of PoC charges for RRVPNL only.

9. RRVPNL has submitted its rejoinder, vide affidavit dated 4.9.2017, to the reply filed by MPPMCL and the clarifications given by RRVPNL are as under:-

(a) In Petition No. 213/TT/2013 filed by RRVPNL, YTC was approved for 164 and 121 km of lines and in Petition No. 217/TT/2013 filed by MPPTCL YTC was approved for 103.92 x 2 km only i.e. up to the MP-Rajasthan border. RRVPNL has claimed YTC charges for 164 and 121 km of the lines whereas MP has claimed 103.92 x 2 km i.e. up to the MP-Rajasthan border. 59.624 km of 220 kV



Kota- Badod line and 16.50 km of 220 kV Modak- Badod (Bhanpur) line up to Rajasthan-MP border is under the administrative jurisdiction of RRVPNL and hence Commission may allow the tariff accordingly.

(b) RVPN has claimed YTC charges for 35.24 km of 132 kV S/C Khandar-Sheopur line and out of 35.24 km of 132 kV S/C Khandar- Sheopur line, 12.62 km LILO portion of the line is under the administrative jurisdiction of RRVPNL and hence Commission may allow the tariff accordingly.

10. MPPMCL, Respondent No. 5, filed its reply vide affidavit dated 7.12.2017, and the issues raised by MPPMCL are as follows:-

a) RRVPNL and MPPTCL should ensure correctness of the length of the above assets in their geographical locations. Since the synchronization of Western Region and Northern Region, these lines are being utilized for LTOA and STOA, the charges realized should be adjusted in the truing up of aforesaid lines. Further, RRVPNL may be directed to submit the details of STOA charges of above two assets.

b) RRVPNL's claim for depreciation is not justifiable because the "lines are quite old" and fully depreciated. The depreciation amount in the true up order of the State Commission may not be allowed in respect of Kota-Badod and Modak-Badod lines.

c) If actual O&M Expenses is lower than the O&M Expenses computed in YTC based on the State Commission's truing-up, the actual O&M Expenses in respect of Kota-Badod and Modak-Badod lines should be considered.



11. We have considered the submissions of RRVPNL and respondents placed on record. NRPC has certified that Assets 5, 6, 7 and 14 to 20 are deemed ISTS lines and Assets 1 to 4 as natural inter-State transmission lines and are being considered for tariff computation in the present order. Against the earlier approved line length of 164 ckt-km for 220 kV S/C Kota (Sakatpura)-Badod (Raj-MP), 121 ckt-km for 220 kV S/C Modak- Badod (Raj-MP) and 35.24 km for 132 kV S/C Khandar- Sheopur line, the revised line length considered for tariff computation is 59.624 ckt-km of 220 kV Kota-Badod line, 16.50 ckt-km of 220 kV Modak-Badod (Bhanpur) line and 12.62 ckt- km for 132 kV S/C Khandar-Sheopur line. Thus, the revised line length of the said transmission lines considered for the purpose of computation of transmission charges is as under:-

<b>Srl. No.</b>	<b>Name of Line</b>	<b>Voltage Level</b>	<b>Length of Line in Ckt. KM</b>	<b>COD</b>
1.	132 kV S/C Khandar- Sheopur line	132 kV	12.62	05.07.2008
2.	220 kV S/C Kota (Sakatpura)-Badod (Raj-MP)	220 kV	59.624	20.08.1977
3.	220 kV S/C Modak-Badod (Raj-MP)	220 kV	16.50	02.01.1988

The tariff is worked out for the remaining ISTS transmission lines considering the line length claimed by RRVPNL.

12. RRVPNL has claimed transmission tariff for twenty inter-State transmission lines for the period 2014-15 to 2016-17. The Commission vide order dated 14.3.2012 in Petition No. 15/SM/2012 had directed 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 to file petitions under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 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. Some of the owners/developers of these lines had filed tariff petitions and accordingly, tariff was allowed for the period from 2011-12 to 2013-14. Further, the owners/developers of these lines were directed to file petitions for determination of tariff for the 2014-19 tariff period.

13. It is observed that the information submitted by the petitioner States for computation of transmission charges for the deemed ISTS lines are not uniform, thereby causing divergence in working out the tariff. In some cases, the data related to funding and depreciation was not available and in some cases the assets have already completed, or nearing, their useful life. In most of the petitions, the states have expressed their inability to furnish the audited capital cost of transmission lines as the lines are old. As a result, tariff workings for old assets are ending in skewed results. It is further observed that the YTC figures emerging out by the existing ARR methodology are on the higher side. Considering these facts, we have conceptualized a modified methodology for determining the tariff of the inter-State transmission lines. The methodology is broadly based on the following:-

- (a) PGCIL's Annual Report data has been used as the reference data; based on which, year wise benchmark cost has been derived.



- (b) Useful life of Transmission Line has been considered as 25 years. Thus, if life is more than or equal to 25 years as on 1.4.2014, only O & M Expenses and Interest on Working Capital (IWC) shall be allowed as per the existing Tariff Regulations, in lieu of complete tariff.
- (c) It is expected that the States do have the audited financial data of recently commissioned (i.e. on or after 1.4.2014) lines.

### **Tariff Methodology**

14. As per the petitions filed by the states, their ISTS lines generally have the configuration of 132 kV, 220 kV or 400 kV. In the absence of an established tariff data base, in order to develop this methodology Annual Reports of PGCIL from 1989-90 to 2013-14 have been referred to. The Annual Reports depict, inter alia, the information pertaining to year wise total length of transmission lines in ckt-km and corresponding Gross Block. This pan-India data represents all the five transmission regions and is a composite mix of parameters like terrains, wind-zones, tower and conductor type etc. +/- 500 kV HVDC and 765 kV and above voltage level AC lines too have come up in between and the data also includes those lines. Voltage level-wise data as on 30<sup>th</sup> April 2017, obtained from PGCIL indicates that the percentage of 220 kV, 132 kV and 66 kV Transmission Line taken together makes it around 8.3 % of the total line length owned by PGCIL. Further, 132 kV Transmission Lines were established in NER prior to 1990, and Transmission Lines of 220 kV voltage levels were last commissioned in around the year 2004 in NR. Majority of the transmission lines consist of 400 kV which corresponds to 66% of the total transmission line lengths. Thus, the 400 kV and lesser voltage levels account for approximately 75% of the transmission lines. Assuming the above referred



spread of voltage wise percentages for earlier years too, it can be said that the year wise average Transmission Line cost figures derived from PGCIL data, when further reduced by 25%, fairly represent the average transmission line capital cost corresponding to a 400 kV S/C line. Considering 400 kV S/C transmission line cost as reference cost, analysis of PGCIL's indicative cost data (P/L Feb 2017) suggests the following:-

	<b>Reference cost of 400 kV S/C TL</b>	<b>₹ X lakh/km</b>
1	400 kV D/C TL	1.39 X
2	220 kV D/C TL	0.57 X
3	220 kV S/C TL	0.36 X
4	132 kV D/C TL	0.43 X
5	132 kV S/C TL	0.31 X

15. Therefore, for arriving at the costs of transmission lines of other voltage levels and circuit configurations, the average transmission line cost data shall be multiplied by the factors illustrated in the above table. Lower voltage levels can be treated as part of 132 kV. The above table contemplates *Twin Moose* conductor which is widely used in State transmission lines.

16. Based on respective year end data, average transmission line length during the year has been worked out. Difference between a particular year's average transmission line length figures and that for the immediate preceding year provides us the transmission line length added during that year. Average gross block corresponding to transmission lines has been divided by the average transmission line length to arrive at the Average Cost of transmission line (in ₹ lakh per ckt-km) during the year. Thus, considering the year of COD of a State's ISTS line and its ckt-km, its cost would be worked out by relating it to PGCIL's transmission line cost during that year. Although the



Commission has relied on PGCIL's Annual Reports, there are certain deviations in the cost data worked out. The year 1989-90 was the year of incorporation for PGCIL, and the transmission assets of NTPC, NHPC, NEEPCO etc were taken over by PGCIL by mid 1991-92. Thus, as the base data for these years was not available, the corresponding average cost of transmission line could not be worked out. The average cost from 1992-93 onwards up to 2013-14 shows an increasing trend at a CAGR of 5.17%. Therefore, for the years 1989-90, 1990-91 and 1991-92, the average cost of transmission line has been back derived considering the 1992-93 average cost. Similarly, abnormal dip/spikes in the transmission line cost for the years 1996-97, 2001-02 and 2004-05 has been corrected by considering the average values of the transmission line costs in the immediate preceding and succeeding years.

17. While calculating tariff, the following has been considered:-

- (i) Useful life of the transmission line shall be deemed to be 25 years.
- (ii) Prevailing depreciation rates as per the 2014 Tariff Regulations shall be considered uniformly for all the previous tariff periods so as to do away with the Advance Against Depreciation which was in vogue during earlier tariff periods. Notwithstanding the depreciation considered as recovered earlier, for the purpose of these tariff calculations, remaining depreciable value shall be spread over the remaining useful life of the transmission line, where the elapsed life is more than or equal to 12 years.
- (iii) Normative Debt-Equity ratio shall be 70:30.
- (iv) Normative loan repayment during a year shall be deemed to be equal to the depreciation allowed for that year.



- (v) Rate of Interest on normative loan shall be the weighted average rate of interest as derived on the basis of PGCIL's Balance Sheet.
- (vi) In order to avoid complexity, grossing up of rate of Return on Equity with tax rate is being dispensed with.
- (vii) Bank rate as defined in 2014 Tariff Regulations, 2014 as on 1.4.2014 shall be applied for calculating the rate of interest on working capital on normative basis.
- (viii) O & M Expenses as per the 2014 Tariff Regulations shall be considered.
- (ix) Where the life of transmission line is more than or equal to 25 years as on 1.4.2014, only O & M Expenses and IWC shall be allowed in lieu of complete tariff.

18. Thus, in effect, this is a normative tariff working methodology which shall be applied in those cases where the audited capital cost information is not available. In the instant case, RRVPNL has not provided the audited capital cost certificates. In line with the methodology explained in foregoing paragraphs, we now proceed to determine the tariff for instant transmission lines.

19. Assets-2, 3 and 5 to 13 have already completed twenty five years. Therefore, as per the above methodology, only IWC and O & M components of tariff shall be allowable for these assets. For Assets-1 and 4 all the components of tariff have been worked out. For Assets-14, 15, 16, 17 and 20, YTC is worked out only for the year 2016-17.





20. Assets-18 and 19 were put into commercial operation on 29.3.2015 and 25.3.2015 respectively and tariff is not allowed in this order for these assets as per the methodology mentioned above as RRVPNL must have the audited financial data of these transmission lines. RRVPNL is granted liberty to file a fresh petition for determination of YTC of these lines along with the relevant cost data as per the 2014 Tariff Regulations.

21. The annual transmission charges being allowed are:-

(₹ in lakh)

Asset-1	2014-15	2015-16	2016-17
Depreciation	117.22	117.22	117.22
Interest on Loan	81.37	65.18	57.11
Return on Equity	103.23	103.23	103.23
IWC	9.58	9.30	9.20
O & M Expenses	47.67	49.32	50.98
<b>Total</b>	<b>359.07</b>	<b>344.25</b>	<b>337.74</b>

(₹ in lakh)

Asset-2	2014-15	2015-16	2016-17
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	1.74	1.80	1.86
O & M Expenses	31.51	32.60	33.70
<b>Total</b>	<b>33.25</b>	<b>34.41</b>	<b>35.56</b>

(₹ in lakh)

Asset-3	2014-15	2015-16	2016-17
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	1.79	1.85	1.91
O & M Expenses	32.32	33.44	34.56
<b>Total</b>	<b>34.11</b>	<b>35.29</b>	<b>36.47</b>

(₹ in lakh)

Asset-4	2014-15	2015-16	2016-17
Depreciation	9.82	9.82	9.82
Interest on Loan	5.42	4.05	3.37
Return on Equity	8.65	8.65	8.65
IWC	0.83	0.81	0.80



O & M Expenses	5.10	5.28	5.45
<b>Total</b>	<b>29.82</b>	<b>28.61</b>	<b>28.09</b>

(₹ in lakh)

<b>Asset-5</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	1.50	1.55	1.60
O & M Expenses	27.07	28.01	28.94
<b>Total</b>	<b>28.56</b>	<b>29.55</b>	<b>30.54</b>

(₹ in lakh)

<b>Asset-6</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	0.94	0.97	1.00
O & M Expenses	16.97	17.56	18.14
<b>Total</b>	<b>17.91</b>	<b>18.53</b>	<b>19.15</b>

(₹ in lakh)

<b>Asset-7</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	0.04	0.05	0.05
O & M Expenses	0.81	0.84	0.86
<b>Total</b>	<b>0.85</b>	<b>0.88</b>	<b>0.91</b>

(₹ in lakh)

<b>Asset-8</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	2.94	3.04	3.14
O & M Expenses	53.17	55.01	56.85
<b>Total</b>	<b>56.10</b>	<b>58.05</b>	<b>59.99</b>

(₹ in lakh)

<b>Asset-9</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	1.07	1.11	1.15
O & M Expenses	19.44	20.11	20.79
<b>Total</b>	<b>20.51</b>	<b>21.23</b>	<b>21.94</b>



(₹ in lakh)

<b>Asset-10</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	1.33	1.38	1.42
O & M Expenses	24.09	24.92	25.76
<b>Total</b>	<b>25.42</b>	<b>26.30</b>	<b>27.18</b>

(₹ in lakh)

<b>Asset-11</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	0.37	0.38	0.39
O & M Expenses	6.67	6.90	7.13
<b>Total</b>	<b>7.03</b>	<b>7.28</b>	<b>7.52</b>

(₹ in lakh)

<b>Asset-12</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	1.58	1.64	1.69
O & M Expenses	28.65	29.64	30.63
<b>Total</b>	<b>30.23</b>	<b>31.28</b>	<b>32.33</b>

(₹ in lakh)

<b>Asset-13</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Depreciation	0.00	0.00	0.00
Interest on Loan	0.00	0.00	0.00
Return on Equity	0.00	0.00	0.00
IWC	1.72	1.78	1.84
O & M Expenses	31.11	32.19	33.26
<b>Total</b>	<b>32.83</b>	<b>33.96</b>	<b>35.10</b>

(₹ in lakh)

<b>Particulars</b>	<b>Asset-14</b>	<b>Asset-15</b>	<b>Asset-16</b>
	<b>2016-17</b>	<b>2016-17</b>	<b>2016-17</b>
Depreciation	153.47	372.67	432.99
Interest on Loan	8.38	235.33	148.53
Return on Equity	135.16	328.21	381.33
IWC	9.39	24.11	26.28
O & M Expenses	46.16	46.43	74.52
<b>Total</b>	<b>352.56</b>	<b>1006.75</b>	<b>1063.66</b>



Particulars	(₹ in lakh)	
	Asset-17 2016-17	Asset-20 2016-17
Depreciation	255.74	115.96
Interest on Loan	13.97	81.58
Return on Equity	225.22	102.12
IWC	15.64	9.34
O & M Expenses	76.93	44.30
<b>Total</b>	<b>587.50</b>	<b>353.30</b>

22. Detailed calculations in case of Assets-1, 4, 14, 15, 16, 17 and 20 are given in **Annexure-(I) to (VII)**.

### **Filing Fee**

23. The petitioner shall be entitled for reimbursement of the filing fees in connection with the present petition, directly from the beneficiaries on pro-rata basis in accordance with clause (1) of Regulation 52 of the 2014 Tariff Regulations.

### **Sharing of Transmission Charges**

24. The transmission charges shall be recovered on monthly basis in accordance with Regulation 43 of Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2014 and shall be shared by the beneficiaries and long term transmission customers in terms of the Central Electricity Regulatory Commission (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010 as amended from time to time. Further, the transmission charges allowed in this order shall be adjusted against the ARR approved by the State Commission.

25. Accordingly, Petition No. 112/TT/2017 is disposed of.

**Sd/-**  
**(Dr. M. K. Iyer)**  
**Member**

**Sd/-**  
**(A.S. Bakshi)**  
**Member**

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



## Annexure-I

CALCULATION OF ANNUAL TRANSMISSION CHARGES OF ASSET-1					
					(Rs. In lacs)
Rationalised cost of 400 kv line Rs lakh per ckt km	52.26				Life in years = 25
Transmission Line length , in ckt km	118.00				Voltage = 220 kV
Multiplication factor	0.36				
			<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
<b>Gross Block</b>			2220.00	2220.00	2220.00
Addition during 2014-19 due to Projected Additional Capitalisation			0.00	0.00	0.00
Gross Block total			2220.00	2220.00	2220.00
Average Gross Block			2220.00	2220.00	2220.00
<b>Depreciation</b>					
Rate of Depreciation		5.2800%	5.2800%	5.2800%	5.2800%
Depreciable value		90%	1998.00	1998.00	1998.00
Elapsed Life as on 31.03.2014		<b>3</b>	3.00	4.00	5.00
Balance useful life of the asset			22.00	21.00	20.00
Remaining Depreciable value			1646.36	1529.14	1411.92
Cumulative Depreciation	351.65	<b>351.65</b>	468.87	586.08	703.30
	1646.36	<b>0.00</b>			
Depreciation			117.22	117.22	117.22
<b>Interest on Loan</b>					
Gross Normative Loan		1554.00	1554.00	1554.00	1554.00
Cumulative Repayment upto Previous Year			351.65	586.08	703.30
Net Loan-Opening			1202.35	967.92	850.71
Addition due to Additional Capitalisation			0.00	0.00	0.00
Repayment during the year			117.22	117.22	117.22
Net Loan-Closing			1085.14	850.71	733.49
Average Loan			1143.75	909.31	792.10
Weighted Average Rate of Interest on Loan			7.1141%	7.1680%	7.2104%
Interest			81.37	65.18	57.11
<b>Return on Equity</b>					
Gross Notional Equity		666.00			
Opening Equity			666.00	666.00	666.00
Average Equity			666.00	666.00	666.00
Rate of Return on Equity			15.50%	15.50%	15.50%
Return on Equity			103.23	103.23	103.23



<b>Interest on Working Capital</b>					
Maintenance Spares			7.15	7.40	7.65
O & M expenses			3.97	4.11	4.25
Receivables		2 Months	59.84	57.37	56.29
Total			70.97	68.88	68.18
Interest		13.50%	<b>9.58</b>	<b>9.30</b>	<b>9.20</b>
<b>Annual Transmission Charges</b>					
Depreciation			117.22	117.22	117.22
Interest on Loan			81.37	65.18	57.11
Return on Equity			103.23	103.23	103.23
Interest on Working Capital			9.58	9.30	9.20
O & M Expenses			47.67	49.32	50.98
<b>Total</b>			<b>359.07</b>	<b>344.25</b>	<b>337.74</b>



**Annexure-II**

<b>CALCULATION OF ANNUAL TRANSMISSION CHARGES OF ASSET-4</b>					
<b>(Rs. In lacs)</b>					
Rationalised cost of 400 kv line Rs lakh per ckt km	<b>47.54</b>				Life in years = 25
Transmission Line length , in ckt km	<b>12.62</b>				Voltage = 132 kV
Multiplication factor	0.31				
			<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
<b>Gross Block</b>			185.99	185.99	185.99
Addition during 2014-19 due to Projected Additional Capitalisation			0.00	0.00	0.00
Gross Block total			185.99	185.99	185.99
Average Gross Blcok			185.99	185.99	185.99
<b>Depreciation</b>					
Rate of Depreciation		5.2800%	5.2800%	5.2800%	5.2800%
Depreciable value		90%	167.39	167.39	167.39
Elapsed Life as on 31.03.2014		<b>5</b>	5.00	6.00	7.00
Balance useful life of the asset			20.00	19.00	18.00
Remaining Depreciable value			118.29	108.47	98.65
Cumulative Depreciation	49.10	<b>49.10</b>	58.92	68.74	78.56
	118.29	<b>0.00</b>			
Depreciation			9.82	9.82	9.82
<b>Interest on Loan</b>					
Gross Normative Loan		130.19	130.19	130.19	130.19
Cumulative Repayment upto Previous Year			49.10	68.74	78.56
Net Loan-Opening			81.09	61.45	51.63
Addition due to Additional Capitalisation			0.00	0.00	0.00
Repayment during the year			9.82	9.82	9.82
Net Loan-Closing			71.27	51.63	41.81
Average Loan			76.18	56.54	46.72
Weighted Average Rate of Interest on Loan			7.1141%	7.1680%	7.2104%
Interest			5.42	4.05	3.37
<b>Return on Equity</b>					
Gross Notional Equity		55.80			
Opening Equity			55.80	55.80	55.80
Average Equity			55.80	55.80	55.80



Rate of Return on Equity			15.50%	15.50%	15.50%
Return on Equity			8.65	8.65	8.65
<b>Interest on Working Capital</b>					
Maintenance Spares			0.76	0.79	0.82
O & M expenses			0.42	0.44	0.45
Receivables		2 Months	4.97	4.77	4.68
Total			6.16	6.00	5.95
Interest		13.50%	<b>0.83</b>	<b>0.81</b>	<b>0.80</b>
<b>Annual Transmission Charges</b>					
Depreciation			9.82	9.82	9.82
Interest on Loan			5.42	4.05	3.37
Return on Equity			8.65	8.65	8.65
Interest on Working Capital			0.83	0.81	0.80
O & M Expenses			5.10	5.28	5.45
<b>Total</b>			<b>29.82</b>	<b>28.61</b>	<b>28.09</b>





**Annexure-III**

<b>CALCULATION OF ANNUAL TRANSMISSION CHARGES OF ASSET-14</b>			
<b>(₹ in lakh)</b>			
Rationalised cost of 400 kV line ₹ lakh per ckt km	<b>27.20</b>		Life in years = 25
Transmission Line length, in ckt km	<b>106.86</b>		Voltage = 400 kV
Multiplication factor	1.00		
			<b>2016-17</b>
<b>Gross Block</b>			2906.59
Addition during 2014-19 due to Projected Additional Capitalisation			0.00
Gross Block total			2906.59
Average Gross Block			2906.59
<b>Depreciation</b>			
Rate of Depreciation		5.2800%	5.2800%
Depreciable value		90%	2615.93
Elapsed Life as on 31.03.2014		<b>9</b>	11.00
Balance useful life of the asset			14.00
Remaining Depreciable value			927.78
Cumulative Depreciation	1381.21	<b>1381.21</b>	1841.62
	1234.72	<b>0.00</b>	
Depreciation			153.47
<b>Interest on Loan</b>			
Gross Normative Loan		2034.61	2034.61
Cumulative Repayment upto Previous Year			1841.62
Net Loan-Opening			193.00
Addition due to Additional Capitalisation			0.00
Repayment during the year			153.47
Net Loan-Closing			39.53
Average Loan			116.26
Weighted Average Rate of Interest on Loan			7.2104%
Interest			8.38
<b>Return on Equity</b>			
Gross Notional Equity		871.98	
Opening Equity			871.98
Average Equity			871.98
Rate of Return on Equity			15.50%
Return on Equity			135.16



<b>Interest on Working Capital</b>			
Maintenance Spares			6.92
O & M expenses			3.85
Receivables		2 Months	58.76
Total			69.53
Interest		13.50%	<b>9.39</b>
<b>Annual Transmission Charges</b>			
Depreciation			153.47
Interest on Loan			8.38
Return on Equity			135.16
Interest on Working Capital			9.39
O & M Expenses			46.16
<b>Total</b>			<b>352.56</b>



**Annexure-IV**

<b>CALCULATION OF ANNUAL TRANSMISSION CHARGES OF ASSET-15</b>			
(₹ in lakh)			
Rationalised cost of 400 kV line ₹ lakh per ckt km	<b>65.67</b>		Life in years = 25
Transmission Line length, in ckt km	<b>107.48</b>		Voltage = 400 kV
Multiplication factor	1.00		
			<b>2016-17</b>
<b>Gross Block</b>			7058.21
Addition during 2014-19 due to Projected Additional Capitalisation			0.00
Gross Block total			7058.21
Average Gross Block			7058.21
<b>Depreciation</b>			
Rate of Depreciation		5.2800%	5.2800%
Depreciable value		90%	6352.39
Elapsed Life as on 31.03.2014		1	3.00
Balance useful life of the asset			22.00
Remaining Depreciable value			5234.37
Cumulative Depreciation	372.67	<b>372.67</b>	1490.69
	5979.72	<b>0.00</b>	
Depreciation			372.67
<b>Interest on Loan</b>			
Gross Normative Loan		4940.75	4940.75
Cumulative Repayment upto Previous Year			1490.69
Net Loan-Opening			3450.05
Addition due to Additional Capitalisation			0.00
Repayment during the year			372.67
Net Loan-Closing			3077.38
Average Loan			3263.72
Weighted Average Rate of Interest on Loan			7.2104%
Interest			235.33
<b>Return on Equity</b>			
Gross Notional Equity		2117.46	
Opening Equity			2117.46
Average Equity			2117.46
Rate of Return on Equity			15.50%
Return on Equity			328.21
<b>Interest on Working Capital</b>			



Maintenance Spares			6.96
O & M expenses			3.87
Receivables		2 Months	167.79
Total			178.63
Interest		13.50%	<b>24.11</b>
<b>Annual Transmission Charges</b>			
Depreciation			372.67
Interest on Loan			235.33
Return on Equity			328.21
Interest on Working Capital			24.11
O & M Expenses			46.43
<b>Total</b>			<b>1006.75</b>



## Annexure-V

<b>CALCULATION OF ANNUAL TRANSMISSION CHARGES OF ASSET-16</b>			
(₹ in lakh)			
Rationalised cost of 400 kV line ₹ lakh per ckt km	<b>47.54</b>		Life in years =25
Transmission Line length, in ckt km	<b>172.50</b>		Voltage = 400 kV
Multiplication factor	1.00		
			<b>2016-17</b>
<b>Gross Block</b>			8200.65
Addition during 2014-19 due to Projected Additional Capitalisation			0.00
Gross Block total			8200.65
Average Gross Block			8200.65
<b>Depreciation</b>			
Rate of Depreciation		5.2800%	5.2800%
Depreciable value		90%	7380.59
Elapsed Life as on 31.03.2014		<b>5</b>	7.00
Balance useful life of the asset			18.00
Remaining Depreciable value			4349.62
Cumulative Depreciation	2164.97	<b>2164.97</b>	3463.95
	5215.61	<b>0.00</b>	
Depreciation			432.99
<b>Interest on Loan</b>			
Gross Normative Loan		5740.46	5740.46
Cumulative Repayment upto Previous Year			3463.95
Net Loan-Opening			2276.50
Addition due to Additional Capitalisation			0.00
Repayment during the year			432.99
Net Loan-Closing			1843.51
Average Loan			2060.00
Weighted Average Rate of Interest on Loan			7.2104%
Interest			148.53
<b>Return on Equity</b>			
Gross Notional Equity		2460.20	
Opening Equity			2460.20
Average Equity			2460.20
Rate of Return on Equity			15.50%
Return on Equity			381.33
<b>Interest on Working Capital</b>			
Maintenance Spares			11.18
O & M expenses			6.21



Receivables		2 Months	177.28
Total			194.66
Interest		13.50%	<b>26.28</b>
<b>Annual Transmission Charges</b>			
Depreciation			432.99
Interest on Loan			148.53
Return on Equity			381.33
Interest on Working Capital			26.28
O & M Expenses			74.52
<b>Total</b>			<b>1063.66</b>



**Annexure-VI**

<b>CALCULATION OF ANNUAL TRANSMISSION CHARGES OF ASSET-17</b>			
<b>(₹ in lakh)</b>			
Rationalised cost of 400 kV line ₹ lakh per ckt km	<b>27.20</b>		Life in years = 25
Transmission Line length, in ckt km	<b>178.07</b>		Voltage = 400 kV
Multiplication factor	1.00		
			<b>2016-17</b>
<b>Gross Block</b>			4843.50
Addition during 2014-19 due to Projected Additional Capitalisation			0.00
Gross Block total			4843.50
Average Gross Block			4843.50
<b>Depreciation</b>			
Rate of Depreciation		5.2800%	5.2800%
Depreciable value		90%	4359.15
Elapsed Life as on 31.03.2014		<b>9</b>	11.00
Balance useful life of the asset			14.00
Remaining Depreciable value			1546.05
Cumulative Depreciation	2301.63	<b>2301.63</b>	3068.84
	2057.52	<b>0.00</b>	
Depreciation			255.74
<b>Interest on Loan</b>			
Gross Normative Loan		3390.45	3390.45
Cumulative Repayment upto Previous Year			3068.84
Net Loan-Opening			321.61
Addition due to Additional Capitalisation			0.00
Repayment during the year			255.74
Net Loan-Closing			65.87
Average Loan			193.74
Weighted Average Rate of Interest on Loan			7.2104%
Interest			13.97
<b>Return on Equity</b>			
Gross Notional Equity		1453.05	
Opening Equity			1453.05
Average Equity			1453.05
Rate of Return on Equity			15.50%
Return on Equity			225.22
<b>Interest on Working Capital</b>			
Maintenance Spares			11.54



O & M expenses			6.41
Receivables		2 Months	97.92
Total			115.87
Interest		13.50%	<b>15.64</b>
<b>Annual Transmission Charges</b>			
Depreciation			255.74
Interest on Loan			13.97
Return on Equity			225.22
Interest on Working Capital			15.64
O & M Expenses			76.93
<b>Total</b>			<b>587.50</b>





## Annexure-VII

<b>CALCULATION OF ANNUAL TRANSMISSION CHARGES OF ASSET-20</b>			
(₹ in lakh)			
Rationalised cost of 400 kV line ₹ lakh per ckt km	<b>65.67</b>		Life in years = 25
Transmission Line length, in km	<b>58.67</b>		<b>Voltage = 220 kV</b>
Multiplication factor	<b>0.57</b>		
			<b>2016-17</b>
<b>Gross Block</b>			2196.13
Addition during 2014-19 due to Projected Additional Capitalisation			0.00
Gross Block total			2196.13
Average Gross Block			2196.13
<b>Depreciation</b>			
Rate of Depreciation		5.2800%	5.2800%
Depreciable value		90%	1976.52
Elapsed Life as on 31.03.2014		<b>1</b>	3.00
Balance useful life of the asset			22.00
Remaining Depreciable value			1628.65
Cumulative Depreciation	115.96	<b>115.96</b>	463.82
	1860.56	<b>0.00</b>	
Depreciation			115.96
<b>Interest on Loan</b>			
Gross Normative Loan		1537.29	1537.29
Cumulative Repayment upto Previous Year			347.87
Net Loan-Opening			1189.42
Addition due to Additional Capitalisation			0.00
Repayment during the year			115.96
Net Loan-Closing			1073.47
Average Loan			1131.45
Weighted Average Rate of Interest on Loan			7.2104%
Interest			81.58
<b>Return on Equity</b>			
Gross Notional Equity		658.84	
Opening Equity			658.84
Average Equity			658.84
Rate of Return on Equity			15.50%
Return on Equity			102.12



<b>Interest on Working Capital</b>			
Maintenance Spares			6.64
O & M expenses			3.69
Receivables		2 Months	58.88
Total			69.22
Interest		13.50%	<b>9.34</b>
<b>Annual Transmission Charges</b>			
Depreciation			115.96
Interest on Loan			81.58
Return on Equity			102.12
Interest on Working Capital			9.34
O & M Expenses			44.30
<b>Total</b>			<b>353.30</b>

