

**CENTRAL ELECTRICITY REGULATORY COMMISSION**

**NEW DELHI**

**Petition No. 216/TT/2013**

**Coram:**

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

**Date of Hearing : 04.06.2015**

**Date of Order : 11.12.2015**

**In the matter of:**

Determination of tariff in respect of Assam Electricity Grid Corporation Limited owned transmission lines/system connecting with other states and intervening transmission lines incidental to inter-State transmission of electricity as per the Central Electricity Regulatory Commission's order dated 14.3.2012 in Petition No. 15/Suo-Motu/2012, for inclusion in POC Transmission charges in accordance with Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009.

**And in the matter of:**

Assam Electricity Grid Corporation Limited,  
1<sup>st</sup> Floor Bijuli Bhawan  
Guwahati -781001.

.....**Petitioner**

**ORDER**

The petitioner, Assam Electricity Grid Corporation Limited (AEGCL) is a successor company incorporated in 2005 after reorganization of Assam State Electricity Board (ASEB) as per provision of the Electricity Act, 2003. The AEGCL is entrusted with the construction and operation of transmission network of Assam and all assets of State network is now under AEGCL. The instant petition has been filed by AEGCL for approval of the annual transmission charges of the transmission assets under the Central Electricity



Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (hereinafter "2009 Tariff Regulations") in compliance of the 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 petition 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. Ten transmission lines were identified by the Commission as ISTS (Inter-State Transmission Lines), for the purpose of inclusion in the POC charges, vide order dated 14.3.2012 in Petition No.15/SM/2012 and AEGCL was directed to file tariff petition for the ten transmission lines, for the purpose of inclusion in the PoC charges. The details of the lines are as follows:-



Srl. No.	Name of Line	Connecting States
1	132 kV Umtru-Sarusajai -I	Assam-Meghalaya
2	132 kV Umtru-Sarusajai -II	Assam-Meghalaya
3	132 kV Kahelipara- Umtru-I	Assam-Meghalaya
4	132 kV Kahelipara- Umtru-II	Assam-Meghalaya
5	132 kV Jiribam-Pailapul	Assam-Manipur
6	132 kV Bokajan -Dimapur	Assam Nagaland-
7	132 kV Dullavcherra-Dharmanagar	Assam-Tripura
8	132 kV Panchgram-Lumshnong	Assam-Meghalaya
9	132 kV -Mariani -Mokokchang	Assam Nagaland-
10	220 kV Kathalguri- Deomali	Assam-Andhra Pradesh

4. The petitioner vide letter dated 17.9.2015, has submitted the list of seven ISTS owned by it and their configuration. The details filed by the petitioner are as follows:-

Srl. No.	Name of Line	Connecting States	Length of line in Ckt. Km (Assam portion)
1	132 kV D/C Kahelipara- Umtru I & II	Assam-Meghalaya	12.60
2	132 kV S/C Mariani-Dimapur	Assam-Nagaland	112.00
3	132 kV S/C Panchgram-Lumshnong	Nagaland-Assam	30.02
4	132 kV S/C Mokokchang-Mariani	Assam-Nagaland	18.80
5	132 kV S/C Ziribum-Pailapool	Assam-Mizoram	15.00
6	132 kV S/C Dullavcherra-Dharmanagar	Assam-Tripura	26.00
7	132 kV D/C Sarusajai-Umium	Assam-Meghalaya	18.20

5. The above lines includes nine lines covered under 15/SM/2012 as indicated at para 3 above. The 132 kV Umtru-Sarusajai -I (i.e. S.No.1) and 132 kV D/C Sarusajai-Umium (S.No. 7) above is indicated as D/C line in place of two 2 lines in para 3 above.

6. We have considered the submission 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.



## **No. of assets to be covered**

7. The instant petition has been filed in response to the Commission's direction for determination of tariff of transmission lines owned or controlled by the STU which carry inter-state power. Section 2(36) of the Electricity Act, 2003 defines the ISTS as under:-

"2(36) inter-State transmission system includes-

- (i) Any system for the conveyance of electricity by means of main transmission line from the territory of one State to another state;
- (ii) The conveyance of electricity across the territory of any intervening State as well as conveyance within the State which is incidental to such inter-State transmission of electricity;
- (iii) The transmission of electricity within the territory of a State on a system built, owned, operated, maintained or controlled by a Central Transmission Utility"

8. Out of the ten transmission lines identified by the Commission seven transmission lines are owned by the petitioner and satisfy the conditions of ISTS. The STU lines used for carrying inter-State power can be considered for inclusion in the PoC charges only if it is certified by RPC in terms of para 2.1.3 of the Annexure-I to Central Electricity Regulatory Commission (Sharing of inter-State Transmission Charges and Losses) Regulations, 2010, which is extracted hereunder:-

"The line-wise YTC of the entire network shall be provided by the Transmission Licensees. In case a line is likely to be commissioned during the Application Period, the data in respect of the same, along with the anticipated COD will be provided by the CTU/ Transmission Licensee to the Implementing Agency.

For the determination of the transmission charges based on Hybrid Methodology applicable in the next Application Period, all the above data shall be provided to the Implementing Agency as per the timelines specified by the Implementing Agency.

Overall charges to be allocated among nodes shall be computed by adopting the YTC of transmission assets of the ISTS licensees, deemed ISTS licensees and owners of the non-ISTS lines which have been certified by the respective Regional Power Committee (RPC) for carrying inter-State power. The Yearly Transmission Charge, computed for assets at each voltage level and conductor configuration in accordance with the provisions of these regulations shall be calculated for each ISTS transmission licensee based on indicative



cost provided by the Central Transmission Utility for different voltage levels and conductor Page 17 of 21 configuration. The YTC for the RPC certified non-ISTS lines which carry inter-State power shall be approved by the Appropriate Commission.

In case line-wise tariff for the RPC certified non-ISTS lines has not been specified by the Appropriate Commission, the tariff as computed for the relevant voltage level and conductor configuration shall be used. The methodology for computation of tariff of individual asset shall be similar to the methodology adopted for the ISTS transmission licensees and shall be based on ARR of the STU as approved by the respective State Commission.

Certification of non-ISTS lines carrying inter-State power, which were not approved by the RPCs on the date of notification of the Central Electricity Regulatory Commission (Sharing of Transmission Charges and Losses) Regulations, 2009, shall be done on the basis of load flow studies. For this purpose, STU shall put up proposal to the respective RPC Secretariat for approval. RPC Secretariat, in consultation with RLDC, using Web Net Software would examine the proposal. The results of the load flow studies and participation factor indicating flow of Inter State power on these lines shall be used to compute the percentage of usage of these lines as inter State transmission. The software in the considered scenario will give percentage of usage of these lines by home State and other than home State. For testing the usage, tariff of similar ISTS line may be used. The tariff of the line will also be allocated by software to the home State and other than home State. Based on percentage usage of ISTS in base case, RPC will approve whether the particular State line is being used as ISTS or not. Concerned STU will submit asset-wise tariff. If asset wise tariff is not available, STU will file petition before the Commission for approval of tariff of such lines. The tariff in respect of these lines shall be computed based on Approved ARR and it shall be allocated to lines of different voltage levels and configurations on the basis of methodology which is being done for ISTS lines.”

9. The petitioner has identified Seven (7) transmission lines as inter-State transmission lines for inclusion in the PoC:-

Srl. No.	Name of Line	Connecting States	Length of line in Ckt. km (Assam portion)	Total chargeable cost (in ₹ lakh)
1	132 kV D/C Kahilipara- Umtru I & II	Assam-Meghalaya	12.60	45.53
2	132 kV S/C Ziribum-Pailapool	Assam-Manipur	15.00	44.35
3	132 kV Dimapur-Bokajan	Nagaland-Assam	15.50	48.85
4	132 kV Dullavcherra-Dharmanagar	Assam-Tripura	26.00	49.88
5	132 kV Panchgram-Lumshnong	Assam-Meghalaya	30.02	47.67
6	132 kV Mokokchang-Mariani	Nagaland-Assam	18.80	58.16
7	132 kV D/C Sarusajai-Umium	Assam-Meghalaya	18.20	Not given



The petitioner vide letter dated 17.9.2015 submitted that 132 kV Mariani-Dimapur D/C line may be read as 132 kV Bokajan-Dimapur line and the length of the line is 15.50 Ckt. Km instead of 112.00 Ckt. Km.

### **Capital Cost**

10. The petitioner has submitted that the 132 kV and above transmission lines considered in the instant petition were constructed during early 1960 to 1980 by ASEB. All assets of ASEB were maintained in consolidated form. Therefore, no separate details of assets are available with AEGCL. The instant transmission lines are very old and have completed their useful life and accordingly the capital cost is considered as fully depreciated. Thus, only the Operation and Maintenance Expenses (O&M Expenses) and Interest on Working Capital (IWC) have been considered for the purpose of Annual Fixed Cost of these non-ISTS lines.

11. The Commission vide letter dated 16.11.2012 sought the details of the ARR approved by the State commission for the 2009-14 period and details of the O&M Expenses besides other information. The petitioner has not submitted the said information. As such, the petitioner was again directed vide letter dated 17.6.2014 to submit the above said information, but the petitioner had not furnished the information.

12. The matter was heard on 4.6.2015. The petitioner was directed vide RoP dated 4.6.2015 to submit the network configurations in the prescribed pro-forma and the details of ARR approved by the SERC for the years 2009-10 to 2013-14 separately including the total amount approved for the respective years. The petitioner was directed to implead the respondents and file memo of parties. However, the petitioner has not filed the same.



13. In response the petitioner vide letter dated 3.9.2015, has submitted ARR for the 2009-14 tariff periods as approved by the State Commission. The details of the approved ARR furnished by the petitioner are given hereunder:-

Line* Type	2009-10	2010-11	2011-12	2012-13	2013-14
+500kV HVDC	-	-	-	-	-
+800kV HVDC	-	-	-	-	-
765kV D/C	-	-	-	-	-
765kV S/C	-	-	-	-	-
400kV D/C	0	0	0	0	7
400 Kv DC Quad Moose	-	-	-	-	-
400 kV S/C					
220 kV D/C	958.301	958.301	958.301	1049.95	1073.39
220 kV S/C	337.209	337.209	337.209	337.209	337.209
132 kV D/C	990.85	990.85	998.71	998.71	1026.13
132 kV S/C	1481.54	1497.40	1644.14	1712.66	1754.46
66 kV D/C	541	541	541	541	541
66 kV S/C	154	154	154	154	154
<b>ARR approved**</b>	<b>29921.00</b>	<b>34121.00</b>	<b>39114.00</b>	<b>53645.00</b>	<b>45603.00</b>

\*Line length in ckt. km.

\*\* ARR in ₹ lakh

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

14. 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 of the inter-State transmission lines owned by other entities. Similar approach has been adopted in the instant case. 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 Rs.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.

15. The petitioner also owns lines of 66 kV level but the indicative cost data provided by PGCIL is for voltage level 132 kV and above level. Therefore, line lengths of 66 kV level to 132 kV level have been added 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 indicative cost of lines of various configurations owned and operated by PGCIL are as under:-

**For FY 2011-12:**

(in ₹)

Type	Cost (₹ in lakh)	Cost (₹ in lakh/circuit)	Co-efficient	
765 KV D/C	315.25	157.625 (A)	a=D/A	0.64
765 KV S/C	159.25	159.25 (B)	b=D/B	0.63
400 KV D/C	109.50	54.75 (C)	c=D/C	1.84
400 KV D/C Quad. Moose	202.00	101 (D)	d=D/D	1.00
400 KV S/C	74.25	74.25 (E)	e=D/E	1.36
220 KV D/C	59.50	29.75 (F)	f=D/F	3.39
220 KV S/C	37.00	37.00 (G)	g=D/G	2.73
132 KV D/C	46.75	23.375 (H)	h=D/H	4.32
132 KV S/C	28.50	28.50 (I)	i=D/I	3.54

**For FY 2012-13**

(in ₹)

Type	Cost (₹ in lakh)	Cost (₹ in lakh/circuit)	Co-efficient	
765 KV D/C	357.00	178.5 (A)	a=D/A	0.63
765 KV S/C	179.20	179.20 (B)	b=D/B	0.63
400 KV D/C	122.60	61.3 (C)	c=D/C	1.83
400 KV D/C Quad. Moose	224.80	112.4 (D)	d=D/D	1.00
400 KV S/C	84.20	84.20 (E)	e=D/E	1.33
220 KV D/C	67.80	33.9 (F)	f=D/F	3.32
220 KV S/C	41.40	41.40 (G)	g=D/G	2.71
132 KV D/C	53.00	26.5 (H)	h=D/H	4.24
132 KV S/C	32.40	32.40 (I)	i=D/I	3.47





**For FY 2013-14**

(in ₹)

Type	Cost (₹ in lakh)	Cost (₹ in lakh/circuit)	Co-efficient
765 kV D/C	412.00	206 (A)	a=D/A 0.56
765 kV S/C	179.80	179.80 (B)	b=D/B 0.65
400 kV D/C Twin Moose	130.40	65.2 (C)	c=D/C 1.78
400 kV D/C Quad Moose	232.60	116.3 (D)	d=D/D 1.00
400 kV S/C Twin Moose	87.00	87.00 (E)	e=D/E 1.34
220 kV D/C	61.40	30.7 (F)	f=D/F 3.79
220 kV S/C	37.80	37.80 (G)	g=D/G 3.08
132 kV D/C	48.40	24.2 (H)	h=D/H 4.81
132 kV S/C	30.00	30.00 (I)	i=D/I 3.88

16. 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:-

ARR for FY.....in ₹

$$\left\{ \begin{array}{l} \text{YTC per ckt km} \\ \text{400 kV D/C} \\ \text{Quad Moose} \end{array} \right\} \left\{ \begin{array}{l} \text{(Length of 765 kV DC/a) + (Length of 765 kV SC/b)+ (Length of 400} \\ \text{kV DC QM/c) + (Length of 400 kV DC TM /d) + (Length of} \\ \text{400 kV SC TM /e) + (Length of 220 kV DC /f) + (Length of} \\ \text{220 kV SC /g) + (Length of 132 kV DC /h) + (Length of 132 kV} \\ \text{SC /i)} \end{array} \right.$$

\*value of a, b, c, d, e, f, g, h, & i are as given in para 15 and length in ckt km as given in para 13 above of this order.

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

17. We have not carried out any due diligence of the tariff of these lines (for consideration of PoC calculations). The tariff of the lines owned by STU has already been determined by State Electricity Regulatory Commission. We have considered the ARR of the STU as approved by the State Electricity Regulatory Commission and have adopted



the methodology as discussed in para 14 and 15 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 has been 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.

18. We have considered the submission of the petitioner. 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 and 2013-14 have been calculated as given here under:-

**For FY 2011-12:**

Total ARR approved by the State Commission for 2011-12 is ₹39, 114, 00,000.00  
(YTC in ₹)

Sri. No	Asset	For entire system (Assam)		
		Line length (ckt. km)	YTC (Per ckt. km)	YTC
1	220 kV D/C	958.301	907,507.50	869,665,344.60
2	220 kV S/C	337.209	1,128,664.79	380,595,925.07
3	132 kV D/C	1,539.71	713,041.61	1,097,877,292.73
4	132 kV S/C	1,798.14	869,376.93	1,563,261,437.60
<b>Total</b>				<b>39,114,00,000</b>

**For FY 2012-13:**

Total ARR approved by the State Commission for 2012-13 is ₹53, 645, 00,000.00



(YTC in ₹)

Srl. No	Asset	For entire system (Assam)		
		Line Length (Ckt. km)	YTC (Per ckt. km)	YTC
1	220 kV D/C	1,049.95	1,205,658.62	1,265,881,263.09
2	220 kV S/C	337.209	1,472,397.25	496,505,603.25
3	132 kV D/C	1,539.71	942,476.50	1,451,140,489.74
4	132 kV S/C	1,866.66	1,152,310.89	2,150,972,643.91
<b>Total</b>				<b>53,645,00,000.00</b>

**For FY 2013-14:**

Total ARR approved by the State Commission for 2013-14 is ₹45, 603, 000, 00.00

(YTC in ₹)

Srl. No	Asset	For entire system (Assam)		
		Line Length (Ckt. km)	YTC (Per ckt. km)	YTC
1	400 kV D/C Twin Moose	7.00	2,103,746.36	14,726,224.54
2	220 kV D/C	1,073.39	990,567.69	1,063,265,452.10
3	220 kV S/C	337.209	1,219,656.63	411,279,193.84
4	132 kV D/C	1,567.130	780,838.37	1,22,367,524.11
5	132 kV S/C	1,908.460	967,981.46	1,847,353,888.41
<b>Total</b>				<b>4,560,300,000</b>

**YTC of the seven transmission lines**

19. YTC per ckt. km for 132 kV D/C and 132 kV S/C line considered for Assam lines is as under:-

(YTC in ₹)

Voltage Level	2011-12	2012-13	2013-14
132 kV D/C	713,041.61	942,476.50	780,838.37
132 kV S/C	869,376.93	1,152,310.89	967,981.46

20. YTC of the seven transmission lines calculated as per methodology discussed above is given overleaf:-



(in ₹)

Srl. No.	Name of Line	Length of line (Assam portion)	2011-12 *	2012-13	2013-14
1	132 kV D/C Kahilipara- Umtru	12.60	6,738,243.21	11,875,203.90	9,838,563.51
2	132 kV S/C Ziribam-Pailapool	15.00	9,780,490.46	17,284,663.35	14,519,721.83
3	132 kV S/C Dimapur-Bokajan	15.50	10,106,506.81	17,860,818.80	15,003,712.56
4	132 kV S/C Dullavcherra-Dharmanagar	26.00	16,952,850.19	29,960,083.14	25,167,517.84
5	132 kV S/C Panchgram-Lumshnong	30.02	19,57,4021.64	34,592,372.92	29,058,803.29
6	132 kV S/C Mokokchang-Mariani	18.8	122,582,14.75	21,663,444.73	18,198,051.36
7	132 kV D/C Sarusajai- Umium	18.20	9,733,017.98	17,153,072.30	14,211,258.41
<b>Total</b>			<b>851,433,45.03</b>	<b>150,389,659.13</b>	<b>125,997,628.80</b>

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

21. The annual transmission charges allowed for the assets covered in the instant petition shall be considered in the YTC as per the Sharing Regulations and shall be adjusted against the ARR of the petitioner approved by the State Commission.

22. This order disposes of Petition No. 216/TT/2013.

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

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

