

Appendix- III

Procedure for calculation of Transmission System Availability

1. The transmission elements shall be grouped into following categories for the purpose of calculation of availability of Regional Transmission Systems :
 - i) AC transmission lines: Each circuit of AC transmission line shall be considered as one element.
 - ii) Inter-Connecting Transformers (ICTs): Each ICT bank (three single phase transformer together) shall form one element.
 - iii) Static VAR Compensator (SVC): SVC along with SVC transformer shall form one element. However, 50% credit to inductive and 50% to capacitive rating shall be given.
 - iv) Switched Bus Reactor: Each switched Bus Reactor shall be considered as one element.
 - v) HVDC lines: Each pole of HVDC line along with associated equipment at both ends shall be considered as one element.
 - vi) HVDC back-to-back station: Each block of HVDC back-to-back station shall be considered as one element. If associated AC line (necessary for transfer of inter-regional power through HVDC back-to-back station) is not available, the HVDC back-to-back station block shall also be considered as unavailable.

2. The Availability of Regional Transmission system shall be calculated as under:

% System Availability

$$= \frac{o \times AV_o + p \times AV_p + q \times AV_q + r \times AV_r + s \times AV_s + t \times AV_t}{o + p + q + r + s + t} \times 100$$

Where

o	is	Total number of AC lines.
AV _o	is	Availability of o number of AC lines.
p	is	Total number of HVDC poles.
AV _p	is	Availability of p number of HVDC poles.
q	is	Total number of ICTs.
AV _q	is	Availability of q number of ICTs.
r	is	Total number of SVCs.
AV _r	is	Availability of r number of SVCs.
s	is	Total number of switched bus reactors
AV _s	is	Availability of s number switched bus reactors

3. The weightage factor for each category of transmission elements shall be as under:
 - (a) For each circuit of AC line – Surge Impedance Loading for Uncompensated line (SIL) multiplied by Circuit Km.
SIL rating for various voltage level and conductor configuration is given in Annexure-I to this Appendix.
For inter regional AC lines, 50% of the weightage factor shall be allocated to each Region.
 - (b) For each HVDC pole – The rated MW capacity x Circuit Km.
 - (c) For each ICT bank – The rated MVA capacity.
 - (d) For SVC – The rated MVAR capacity (inductive & capacitive).
 - (e) For switched Bus reactor – The rated MVAR capacity.
 - (f) For HVDC back-to-back station connecting two Regional grids – 50% of the rated MW capacity of each block to each region.
4. The availability for each category of transmission elements shall be calculated based on the weightage factor, total hours under consideration and non-available hours for each element of that category. The formulae for calculation of Availability of each category of the Transmission elements are as per Annexure-II to this Appendix.
5. The transmission elements under outage due to following reasons not attributable to POWERGRID shall be deemed to be available:
 - i) Shut down of POWERGRID transmission elements availed by other agency/agencies for maintenance or construction of their transmission system.
 - ii) Manual tripping of POWERGRID line due to over voltage and manual tripping of switched bus reactor as per the directions of RLDC.
6. Outage time of POWERGRID transmission elements for the following contingencies shall be excluded from the total time of the element under period of consideration.

ANNEXURE-II

Formulae for calculation of Availability of each category of transmission elements

$$AV_o(\text{Availability of } o \text{ no. of AC lines}) = \frac{\sum_{i=1}^o \frac{W_i(T_i - T_{NAi})}{T_i}}{\sum_{i=1}^o W_i}$$

$$AV_p(\text{Availability of } p \text{ no. of HVDC pole}) = \frac{\sum_{j=1}^p \frac{W_j(T_j - T_{NAj})}{T_j}}{\sum_{j=1}^p W_j}$$

$$AV_q(\text{Availability of } q \text{ no. of ICTs}) = \frac{\sum_{k=1}^q \frac{W_k(T_k - T_{NAk})}{T_k}}{\sum_{k=1}^q W_k}$$

$$AV_r(\text{Availability of } r \text{ no. of SVCs}) = \frac{\left[\sum_{l=1}^r \frac{0.5 W_{Ll}(T_{Ll} - T_{NAL})}{T_{Ll}} + \sum_{l=1}^r \frac{0.5 W_{Cl}(T_{Cl} - T_{ACL})}{T_{Cl}} \right]}{\left[\sum_{l=1}^r 0.5 W_{Ll} + \sum_{l=1}^r 0.5 W_{Cl} \right]}$$

$$AV_s(\text{Availability of } s \text{ no. of Switched Bus reactors}) = \frac{\sum_{m=1}^s \frac{W_m(T_m - T_{NAM})}{T_m}}{\sum_{m=1}^s W_m}$$

$$AV_t(\text{Availability of } t \text{ no. of HVDC Back-to-back Blocks}) = \frac{\sum_{n=1}^t \frac{W_n(T_n - T_{NAn})}{T_n}}{\sum_{n=1}^t W_n}$$

Where W_i = Weightage factor for i^{th} transmission line
 W_j = Weightage factor for j^{th} HVDC pole
 W_k = Weightage factor for k^{th} ICT
 W_{Ll} & W_{Cl} = Weightage factors for inductive & capacitive operation of l^{th} SVC
 W_m = Weightage factor for m^{th} bus reactor
 W_n = Weightage factor for n^{th} HVDC back to back block.

$T_i, T_j, T_k, T_{Ll}, T_{Cl}, T_m$ & T_n - The total hours of i^{th} AC line, j^{th} HVDC pole, k^{th} ICT, l^{th} SVC (Inductive Operation); l^{th} SVC (Capacitive Operation), m^{th} Switched Bus Reactor & n^{th} HVDC back-to-back block during the period under consideration (excluding time period for outages not attributable to POWERGRID for reasons given in Para 6 of the procedure)

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$T_{NA1}, T_{NA2}, T_{NA3}$ - the non-availability hours (excluding the time period for outages not attributable to POWERGRID taken as deemed availability as per Para 5 of the procedure) for i^{th} AC line, j^{th} HVDC pole, k^{th} ICT, l^{th} SVC (Inductive Operation), l^{th} SVC (Capacitive Operation), m^{th} Switched Bus Reactor & n^{th} HVDC back-to-back block.

Availability	No. of lines		Total Hours	Trippings	No. of tripped lines/PTRs/Reactors	Avg. Hours
0.998728	No. of 400KV lines	116	233.0323	23	21	
0.998644	No. of 220KV lines	303	641.6333	54	51	
0.998841	No. of 132KV lines	673	1116.4667	110	96	
0.998784	Total	1092	1992.0333	187	168	10.6526
			Actual	10.6526		
	No of PTR'S					
0.999246	No. of 400KV PTRs	110	19.816667	5	5	
0.999000	No. of 220KV PTRs	350	122.650000	14	13	
0.999396	No. of 132KV PTRs	690	15.883333	3	3	
0.999178	Total	1150	158.3500	22	21	7.1977
			Actual	7.1977		
0.999886	No. of Reactors	23	1.00000	1	1	

The Availability of AC Transmission system
TAPM(Transmission System Availability Factor for calender Month)

$$\frac{QXAvo+pXAvp+q}{O+p+q} \times 100 = \frac{((905 \times 1.0) + (187 \times 0.998762)) + (21 \times 1.0) + ((1129 \times 1) + (21 \times 0.999178))}{1092 + 21 + 1150}$$


1092+21+1150

Here				
Q (Total No of lines)	=	1092		
Avg(Availability of no n no AC lines)	=	0.996784	2262.743	2262.74
p (Total no of Reactor	=	21	2263	2263
Avg (Availability of p	=		0.999886	
no of Bus	=	0.999886		
reactors/Switchable				
Q (total no ICTS)	=	1150		
Avg(Availability of Q s	=	0.999178		
% TAPM	=	99.96 %		

K. S. 2113.2416/25.
Chief Engineer/Transmission

Acknowledgement Number:875379431290925

Date of filing : 29-Sep-2025

INDIAN INCOME TAX RETURN ACKNOWLEDGEMENT		Assessment Year
[Where the data of the Return of Income in Form ITR-1(SAHU), ITR-2, ITR-3, ITR-4(SUGAM), ITR-5, ITR-6, ITR-7 filed and verified]		2025-26
(Please see Rule 12 of the Income-tax Rules, 1962)		
PAN	AAFCT0166J	
Name	TRANSMISSION CORPORATION OF TELANGANA LIMITED	
Address	6-3-572, VIDYUT SOUDHA, KHAIRATABAD, KHAIRATABAD, HYDERABAD, 36-Telangana, 500082	
Status	6-Public company	Form Number ITR-6
Filed u/s	139(1)-On or before due date	e-Filing Acknowledgement Number 875379431290925
Taxable Income and Tax Details	Current Year business loss, if any	1 5,37,15,79,904
	Total Income	1A 0
	Book Profit under MAT, where applicable	2 4,58,03,52,556
	Adjusted Total Income under AMT, where applicable	3 0
	Net tax payable	4 81,77,51,198
	Interest and Fee Payable	5 0
	Total tax, interest and Fee payable	6 81,77,51,198
	Taxes Paid	7 1,02,28,61,413
	(+) Tax Payable /(-) Refundable (8-7)	8 (-) 20,51,10,220
	Accreted Income and Tax Detail	Accreted Income as per section 115TD
Additional Tax payable u/s 115TD		10 0
Interest payable u/s 115TE		11 0
Additional Tax and interest payable		12 0
Tax and interest paid		13 0
(+) Tax Payable /(-) Refundable (12-13)		14 0
<p>This return has been digitally signed by <u>VORUGANTI SRINIVAS</u> In the capacity of <u>Director</u> having PAN <u>AAJPV6913G</u> from IP address <u>183.82.105.142</u> on <u>29-Sep-2025 15:47:36</u> at <u>HYDERABAD</u> (Place) DSC SI.No & Issuer <u>8926141</u> & <u>26108486CN=</u> Mudhra Sub CA for Class 3 Individual 2022,OU=Certifying Authority,O=eMudhra Limited,C=IN</p>		
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Barcode/QR Code	AAFT0166J068753794312909251f527eeea6bcb63008533cb9dc567cf971cc7760	
DO NOT SEND THIS ACKNOWLEDGEMENT TO CPC, BENGALURU		

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