



Transmission Planning in TGTRANSCO

- Objective of Transmission planning is developing and strengthening transmission infrastructure to meet Telangana's growing power demand with generation duly balancing load, reliability, and investment efficiency for the 10 years horizon.
- State Transmission Utility (STU) is required to consolidate the load forecast of all DISCOMs and prepare a comprehensive Transmission System Plan (TSP) covering a ten-years period.



Telangana, has recorded a peak demand of 18548MW on 27.03.2026. The main consumers are domestic, Industrial, agriculture and Lift Irrigation.

From 2025-26 onwards, Data centres with concentrated loads are coming up in large quantity to the tune of 7-8GW.

As a part of Telangana Clean and Green Energy Policy, 19GW Intra-state RE evacuation is planned by 2029-30.



Major Sources of Generation are Thermal, Hydel, Renewable Energy and CGS Share.

Contracted Generation Capacity is 23411.54 MW as on 31.03.2026.

Coal/Lignite- 53% , Hydel- 11%, Renewable -34%. and others- 2%



EXISTING SUBSTATIONS:

400KV- 29 Nos

220KV-106 Nos

132KV-258 Nos

EXISTING LINES:

400KV-7741 CKM

220KV-10356 CKM

132KV-13210 CKM





Transmission Planning deals with

- New 400 kV, 220 kV, and 132 kV substations and associated transmission lines
- Line Strengthening
 - Replacing existing conductors with high-ampacity conductors to increase line capacity
- Transformer Augmentation
 - Augmentation of ICT/PTR capacity in existing substations to handle growing demand
- Generation Evacuation
 - Dedicated schemes to evacuate power from new Thermal, Hydel, and Renewable Energy sources



Transmission Planning

- **Line/Transformer loadings** should be within the limits under both normal and (N-1) contingency conditions.
- **Voltage profile:** The Bus voltages should be within the permissible voltage limits as per CEA Transmission Planning Criteria 2023.
- **System losses:** comparatively less losses.
- **(N-1) contingency** study.



CEA Criteria 2023: Voltage Limits

Permissible Bus Voltage Ranges

Bus voltages must be maintained within the following limits under both normal and N-1 contingency conditions to ensure system stability and equipment safety:

Nominal Voltage	Minimum	Maximum
400kV	388 kV	412 kV
220kV	203 kV	240 kV
132kV	125 kV	142 kV

Inter-State proposals are dealt with CTUIL

Technical standards and guidelines as mandated by Central Electricity Authority Transmission Planning Criteria 2023



CEA Transmission Planning Criteria 2023

Substation Capacity & Fault Level Standards

All new substations constructed from **April 2023 onwards** shall be planned as per the following minimum transformation capacities and fault level ratings:

Voltage Level	Transformation Capacity	Fault Level
400kV	2500 MVA	80 kA
220kV	1000 MVA	63 kA
132kV	500 MVA	40 kA

These standards ensure substations are adequately sized for future load growth and system fault withstand capability, avoiding premature obsolescence



CEA Transmission Planning Criteria 2023 Major Guidelines

Sl.No	Voltage Level	Conductor	Loading in MVA (Ambient Temp:45 °C, Conductor Temp:75 °C)
1	132 kV	Panther	85
2	220 kV	Zebra	208
3	220 kV	Moose	234
4	220 kV	HTLS	600
5	400 kV	Twin Moose	850
6	400 kV	Quad Moose	1700
(As per Manufacturers)			
7	132 kV	Cable	200
8	220 kV	Cable	330
9	400 kV	Cable	1050



Transmission Planning Load Growth Projections As Per 20th EPS (Electric Power Survey) by CEA

Year	Peak Demand (MW)
2024-25	16877 17162 (As per Actuals)
2025-26	18138 18548 (As per Actuals)
2026-27	19529
2027-28	20968
2028-29	22488
2029-30	24215
2030-31	25639
2031-32	27059



Transmission Planning SOFTWARE USED:

- PSS[®]E software by SIEMENS is used for conducting load flow studies for 400 kV, 220 kV and 132 kV Network improvements, commonly used by Central and other State utilities.
- CYMEDIST software is used for studying 132 kV Substation proposals, based on the 33kV Network.



Planning Methodology



Studies are conducted on the PSS®E file obtained duly considering State Maximum Demand scenario and future load growth projections for 10 years period



Thank You