

# COMPARISON OF TRANSMISSION TOWER AND MONOPOLE

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**Abstract:** *The transmission of electricity is the process by which large amount of electricity produced at power plant and it transported over long distance for the use of different work and consumers. Generally steel transmission tower and monopole are used to transmit electricity to power utilizer. Where transmission tower is framework construction made of galvanized steel and aluminum sections. This type of transmission tower is used for all type of high voltages line. But it found that the non-availability of land for installation of conventional lattice transmission tower. To defeat this type of practical problem a new concept of transmission line is used, that is MONOPOLE. This research work show how the monopole is more effective than conventional lattice transmission tower by comparing some standpoint of transmission line.*

**Keywords –** cost, (ROW) right of way, transmission tower, monopole

## I. INTRODUCTION

Electricity is most resourceful and convenient form of energy. Per capita consumption of electricity is assume to be a yard-stick for analyze the growth of economy and state or a country. Power generation, transmission and utilization is now days growing widely all over the world. Generally transmission line supported by lattice tower or monopole. The more is reliable tower, the more is reliable transmission line. The tower supports the conductor, insulator and ground wire. It also helps to maintaining the clear distance between live conductors and live conductor and ground. It is very important to know the maximum sag and maximum conductor temperature under no wind condition, for calculation of clearance to ground. But due to high cost of right of way (ROW), this impart of large quantum of power through an optimum corridor. This result increase the high voltage value of transmission line and use of narrow base tower and poles. Also the tower design and line shall be such that it will minimize impact on environment & ecology. This research works trying to manipulate the technical problem occurs during design and planning of transmission with comparing few aspects of conventional lattice tower and suitable monopole for transmission line

## II. TRANSMISSION TOWER:

- I. Transmission tower is conventional tower used for the transmission line. Generally lattice type of tower structure made up of steel and aluminium sections. Now days, installation of transmission tower line getting in problem. Mostly when transmission line is passes through green corridor.
- II. The cost of (ROW) right of way is day by day increasing. So, changing a path of transmission line is found to be costly. It is tough to changing of transmission line path for hilly region due to above reason.
- III. As per the (FCA) Forest Conservation Act ; if transmission line is passing through a forest area, while construction of transmission line through forest, for that permission has taken from the local forest officer. During construction of transmission line, deforestation of path is done. Then power authorities have to do a-forestation for that deforested area, and it is costly to buy new area and do a-forestation.
- IV. It is also found that for higher voltages, as the voltage of transmission line increases, the insulation required between the conductor and earth is increases. This is ultimately increases the cost of line support.
- V. As the voltage increases of transmission line, the required clearance between ground and conductor is also increases, so that height of the tower is required high. Also the more distance required between the conductors. That means cross arms should be long, indirectly increasing section and cost of transmission line and getting heavy design.
- VI. The transmission lines, visually pollute the area where they are installed, moreover this tower suffers from problems like terrorism, destruction and lightning. Also it effects on the way of birds and low flying drones and flying aircrafts can be found dangerous.

## III. MONOPOLE:

- I. Monopole is tapered tabular poles made up of steel or aluminium material. It provides viable alternative to transmission line in India.
- II. Transmission monopole can be installed in locations where less amount of space is available, as it required smaller foot print. It can also installed in place with existing corridor already used by other project such as highways, roads, railway, river.
- III. In ruler areas, poles would increases the more availability of land to the farmers or less deforestation. Usage of restricted space for monopole, provide direct design which result in optimizing the total line cost. Shorter length of line minimize the losses of electricity and result in saving over conductor, insulation hardware and foundation and erection cost.
- IV. As monopole are environmental friendly structure. This are compatible with environment and remove visual pollution.
- V. It can assembled in horizontal or vertical, having proper equipment's and trained persons. For transmission line poles can installed in 1 to 3 hours or multiple structure can be installed in one day.
- VI. As monopole assembled in horizontal direction on ground with all components, lifted with cranes and erected vertically on the foundation which reduces installation time than compared with the vertical installation and required less installation cost.
- VII. Monopole is more flexible under heavy loads. Multi side or rounded shape profile induces less wind load. Galvanization on monopole acts as effective corrosion protection against environment changes.

#### IV. CONCLUSION :

From the above study of comparison of lattice tower and monopole, it is found that the monopole construction is easier and optimum in cost. In future it is better to go for construction of monopole than conventional transmission tower. Also monopole easy for maintaining, and safe for environment. As it required minimum criteria for design of monopole and installation, monopole stand for better option to the transmission line.

#### VI. REFERENCES

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