Right of Way (ROW) Challenge in Construction of Transmission lines & its Mitigation in India

SYNOPSIS :

At COP26 summit in Glasgow in Nov'2021, India has pledged 500 GW of non-fossil fuel based installed capacity by the year 2030 and agreed to meet 50% of its energy requirement by renewable sources. To meet this ambitious target, many Solar parks, Hybrid wind-solar power projects, Offshore wind plants are under development. Also, various new technologies are being introduced in grid like Battery Energy Storage System (BESS) & Green Hydrogen Energy to reduce the carbon footprint. Globally, the work is going on for developing the One Sun, One World, One Grid (OSOWOG). For the evacuation of this huge quantum of renewable power, matching transmission infrastructure shall be required. Moreover, gestation period of renewable power projects being less, building transmission infrastructure in shorter time is a big challenge being faced by planners. India is developing green energy corridors for evacuation of the renewable energy from generation point to the load centres by creating intra-state and inter-state transmission infrastructure through Regulatory Tariff Mechanism (RTM) as well as Tariff Based Competitive Bidding (TBCB) routes. Land acquisition and getting right of way (ROW) are becoming the biggest hurdles in constructing the transmission infrastructure in time due to rapid urbanisation and litigations issues. This paper aims to give information about the ROW and how it is a significant challenge for transmission utilities/ companies in Construction and O & M phase and the mitigation measures.

INTRODUCTION.

Power transmission and other infrastructure projects generally face various issues relating to environmental/ forest clearances/ approvals, land acquisitions, ROW as well as local resistance during their construction. The demand of electricity in India is increasing rapidly due to industrial development, increased rural electrification and urbanization. Accordingly, transmission & distribution networks are required to meet the increasing demand of electricity. With the strong emphasis on renewable energy sources which are mostly located in remote areas, their integration to the grid requires massive transmission infrastructure and that too, in a shorter time frame. The construction of Transmission lines is becoming more challenging day by day because of getting Right of way, acquisition of land and various statutory and environmental clearances. Due to increasing awareness and rapid urbanisation, it is getting very difficult to get Right of way and routing through urban area, public park, near schools, playground, forest area, wildlife corridor and in urban slums, metropolitan areas, public parks etc. pose severe challenge.

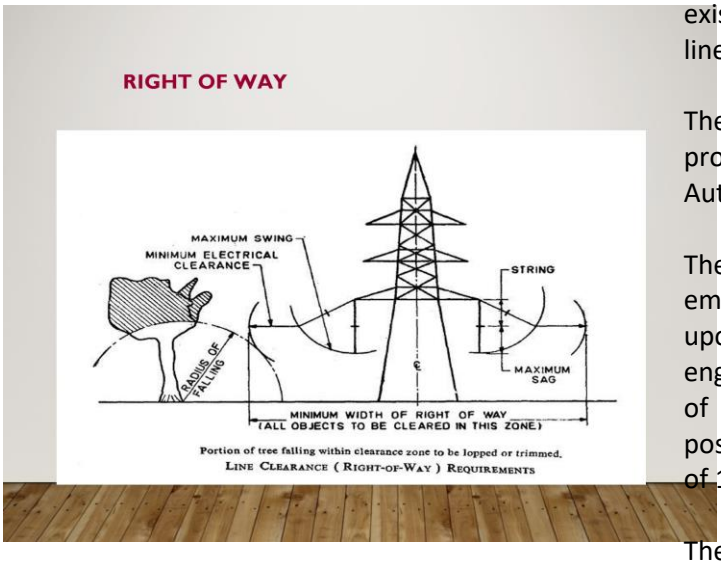
Govt of India vide circular dated 15.10.2015 developed the guidelines for ROW compensation payment for resolving the ROW and early completion of transmission projects which include the tower base land and corridor land value compensation.

The various laws/acts relating to ROW compensation, litigation and land acquisition are The Telegraph Act, 1885, The Electricity Act, 2003, The Land Acquisition Act, 1894, The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Amendment) Ordinance, 2014, The Forest (Conservation) Act, 1980, The Wildlife (Protection) Act, 1972, The Environmental (Protection) Act, 1986, The Indian Electricity (IE) Rules (77, 80(1), 80(2) for clearance), The Indian Limitation Act, 1963, The Work of Licensees Rule, 2006, Indian Standard IS-5613 etc.

Keywords- ROW (Right of way), Reconductoring, Uprating, Transmission line, High Temperature Low Sag (HTLS) Conductor, Ground Clearance, One Sun, One World, One Grid (OSOWOG), MOP (Ministry of Power).

A) Right of Way Corridor - Statutory Provisions

The Right of Way in a transmission line is basically a strip of land required by a utility for constructing, maintaining and protecting its transmission line. Right of Way also named as Transmission Corridor, is minimum safety corridor around power lines to meet the requisite safety clearances as well as the electromagnetic field exposure limits. It allows the utility to keep the power lines clear of tall trees, building and other obstacles that may interfere with line operation and to ensure safety of public and environment.



The important laws governing the Right of Way are the Indian Telegraph Act, 1885 and the Electricity Act, 2003. The provision contained in Section 12 to 18 of the Electricity Act, 1910 remained in force until the rules under Section 67 to 69 of the Electricity Act, 2003 are made. Also, the procedure and provisions under Section 12 to 18 of Electricity Act, 1910 were not adequate for major Generation or Transmission Projects. Hence, the express provision for speedy execution is made under Section 164 of the Electricity Act, 2003. (Previously under Section 42 of Electricity Supply Act, 1948).

The Section 67 of the Electricity Act, 2003 provides for a licensee to lay down, interalia, electric supply lines, electric plant and other works and to do all other acts necessary for transmission or supply of electricity. It also stipulates that a licensee shall cause as little damage and shall make full compensation for any damage caused and in case of any difference or dispute, the matter shall be determined by the Appropriate Commission.

The Section 68 of the Electricity Act, 2003 has the provisions relating to overhead lines. It interalia stipulates that where any tree or any structure or other object interrupts or interferes with, or is likely to interrupt or interfere with, the transmission of electricity or the accessibility of any works, an Executive Magistrate or authority specified by the Appropriate Government may, on the application of the licensee, cause the tree, structure or object to be removed or award compensation considering its existence before or after the placing of the overhead line.

The Section 69 of the Electricity Act, 2003 has the provision related to giving notice to the Telegraph Authority.

The Section 164 of the Electricity Act, 2003 empowers the Appropriate Government to confer upon any public officer, licensee or any other person engaged in the business of supplying electricity, any of the powers which the telegraph authority possesses under the Indian Telegraph Act, 1885 (13 of 1885) with respect to the placing of telegraph lines.

The important sections of the Telegraph Act are Section 10 & Section 16. The Section 10 of the Telegraph Act, 1885 empowers the transmission company to place towers in or upon any immovable property. However, while doing so the company shall not acquire any right other than that of user in the property. The company shall do as little damage as possible and after completion of work shall pay full compensation to all persons interested for any damage sustained by them by reason of the exercise of those powers.

The Section-16 of the Telegraph Act, 1885 assigns the District Magistrate power to clear the obstruction. If the obstruction continues even after making an order by the District Magistrate under sec.16(1), the obstructor shall be deemed to have committed an offence under Sec.188 (45 of 1860) of the Indian Panel Code.

It is the duty of the electricity company to decide and pay the compensation. While deciding the reasonable and realistic amount of compensation, the company may get it done from or with the help of following respective authorities:

Revenue Authorities: - For Crops, non-schedule Trees
Forest Authorities: - For Schedule Trees like Teak.
Horticulture Dept.:- Fruit Bearing Trees.
Agriculture Dept :- Value of Crop damage.
Rubber Board**:-** Rubber trees.

Dispute regarding sufficiency of compensation shall be decided by the District Judge after receiving application from any party concerned.

For felling of Trees, utility will have to take the permission from Tree officer under the Felling of Tree regulation act & Preservation of Tree Act. The forest approval is required for laying the transmission lines through Forest.

B) Transmission Lines Construction Phase ROW issues - MOP Guidelines

During Construction of the Transmission line projects, obstruction to pass over the private land, obstruction of cutting down trees/ crops, demand of heavy amount of compensation, demand of cost of land occupied by huge towers, legal complications/ litigations are encountered by Transmission Utility/Developers.

Voltage in (KV)	220	400 S/C (Horiz Config), ±500 HVDC	400 D/C, S/C (Vertical/ Delta Config)	765 S/C Horiz/ Delta Config/ D/C
ROW Width in Meters	35	52	46	85 / 64 / 67

As per the provision in the Electricity Act, 2003 read with relevant provision of the Indian Telegraph Act,1885 all the surface damages without acquisition of the subject land accrued to person while placing the tower and line are to be compensated. The Transmission lines are constructed under the ambit of the Electricity Act, 2003 with provisions stipulated in Sec 67-68 read with section 10 to 16 of the Telegraph act. The initial survey to be carried out for the estimated cost of the Compensation as well as Compensation Plan for the Temporary Damages (CPTD) is to carried out. The notice is to be served to the land owners for the construction of the line. The NOC from the land owners & Village Head /Grampanchayat will have to be taken for placing the towers.

The Transmission lines, constructed before 2015 in line with the Indian Electricity Act, 2003 read with Section 10 and 16 of the Indian Telegraph Act, 1885, do not have the provision for the Land value (Tower base & Corridor) and diminution of the land value compensation but only for surface damage (Zirat Compensation/ Tree/ Crop/ Hut & House) as verified by the District administration (does not include cost of land). So for enhanced compensation and tower base land value, the landowners used to approach the Courts and litigation process hampers the progress of transmission line construction.

The Ministry of Power, Govt. of India vide letter no 3/7/2015 Trans dated 15.10.2015 has issued Guidelines for determining the compensation towards, 'damages' as stipulated in section 67 & 68 of the Indian Electricity Act-2003 read with Section 10 and 16 of Indian Telegraph Act 1885 which will be in addition to the compensation towards normal crop and trees. These MOP Guidelines are the game changer for resolving the ROW.

As per these guidelines, the Damage compensation shall consist of compensation@ 85% of the land value for tower base area (between 4 legs) and maximum 15% towards diminution land value in width of ROW of the line corridor as determined by District Magistrate or any other authority based on Circle rate/ Guideline value / Stamp Act**.** It is pertinent to mention that Ministry of Power, Govt of India has left the rights to States /UTs for taking up decision regarding adoption of the guidelines considering that acquisition of land is a State subject. In line with this, various states like Assam, Karnataka, Madhya Pradesh, Gujarat, Kerala,

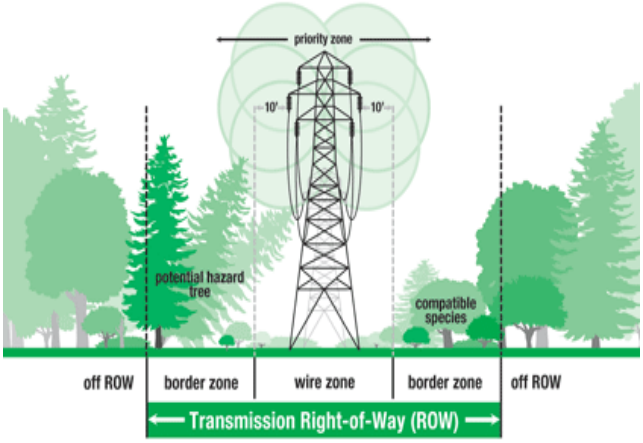
Jharkhand, Tamilnadu and Chhattisgarh have adopted these MOP guidelines as same (85% for Tower base & 15% for the Line corridor). In case of urban areas, additional compensation in form of 'Non-usability allowance' up to 15% of the land value for the width of ROW corridor would also be applicable.

Some of the states that have adopted the MOP guidelines are listed below:-

Name of State.	Methodology
Maharashtra	Tower Base @2 Times (200%) of Ready reckoner rate. Line Corridor tip to tip @15%ready reckoner Circle market rate/Circle rate.
Andhra Pradesh	Tower Base 100% & Line corridor 10%.
Meghalaya & Odisha.	Tower base @ 100 % Line Corridor – 15%
Uttarakhand & Uttar Pradesh.	Tower Base 85% & Line Corridor Nil.
Tripura	100% tower base payment under land acquisition & No land payment for corridor.
Nagaland	100% tower base payment & No land payment for corridor.

The Compensation does not mean the acquisition of the land but only right of use the property. The Telegraph Act, 1885 gives legal tres-pass required for exercising the powers to lay transmission lines. Notices under the electricity act serve to land owners for the surface damage and land ownership confirmation & the consent for the ROW compensation is used to be taken from land owner. District collector and Implementing agency serves the Notice under the electricity act 2003 clause no 164 & Clause no 68(6) of part VIII of Indian Electricity Act, 2003 for the purpose of foundation & stringing purpose. The compensation towards land, Demolition of houses and rehabilitation of Hut/House is the responsibility of owner, compensation is duly assessed by PWD or authorized valuation agency/ Certified Chartered Engineer. In some cases during the construction of the line, if some Schools/ Houses/ Play grounds /Huts /Colleges etc. are encountered the final transmission line route and disputed party approaches the court, the transmission company has to pay the required compensation or divert the route, based on the court decision.

C) Right of Way (ROW) hurdles in O & M stage of Transmission lines: -



During the Operation and Maintenance stage of transmission line also, the surface damage compensation or any pending ROW issue of construction stage has to be addressed by Transmission licensee. The hut and house compensation may also be required to be paid in O & M stage under the order of district collector/ Honorable Court. The landowners first getting the compensation from the line owner and within the span of 3 years approaches the district court/High court for enhancing the surface damage compensation amount and land value as well as diminution of land value. For regular tree cutting work, compensation is required to be paid to landowner by Line owner. Normally trees that grow higher will be cut. For example, trees higher than 3m will be cut to maintain proper ROW under the transmission line, and trees or plants can grow below 3m. The condition and clearance height may differ from country to country.

It is also observed that in some cases which are under litigation, some section of the Transmission line which is constructed and commissioned need

to be shifted as per the order of Courts or any regulatory body. Even for carrying out the replacement of the earth wire by optical ground wire (OPGW) , severe ROW are being faced by the Utilities.

In O & M stage, sometimes land owners demand enhance compensation on the base of prospective yield theory method, growth/girth of that tree during vegetation clearance work. They may also ask for diminution of Land value, Tower base land value even though it is not applicable as per the Telegraph Act , the Electricity Act, 2003 & IS 5613 to the transmission lines constructed before Oct 2015. These laws don't have provision for the Land value & diminution of land value as well as prospective yield theory. Further, notification /Guidelines issued by MOP for the Land compensation is applicable for the lines constructed after Oct 2015.

D)Factors Contributing to ROW :-

i)Span length.
ii)Sag of Conductor (Depends on type of conductor used and maximum operating temperature of the conductor and span length).
iii) Minimum Horizontal safety clearance.
iv)Length of Cross arm length/distance from Centre line of tower (Depends on swing angle, wind velocity ,metal clearance cage width or tower body
v)Configuration of insulators and length of insulators string.(I,V,Y)
vi)wind velocity and angle of swing.
vii)Configuration towers(SC/D/C/Horizontal/Delta).
viii)Electrostatic field below bottom most conductor(10kV/m) and at edge of ROW (5kV/m) at vegetation effect for transmission line corridor and social and environmental study is necessary while designing transmission lines.

E) Approaches for reducing ROW by adapting New Innovative Technologies : -

i) Compact tower design with Insulated cross arm.
ii) Use of Suspension towers with V-string or Tension towers in urban and forest area to reduce ROW.
iii) Use of XLPE Underground EHV Cables**.**
iv) Gas Insulated Transmission Lines (GITL).
v) CICA (Composite Insulated Cross arm) reducing cross arm.
vi) Raising of tower height to reduce the tree cutting**.**
vii) 400kv Hollow core composite post Insulator inner FRP tube.
viii) Use of covered Conductor up to 66kV level. Caging of Conductors.
ix) Possibility of use of VSC based HVDC.
x) Use of Multi Ckt/Multi-Voltage Monopole/Special towers.
xi) Upgrading of the existing line to higher voltage or multi voltage in same ROW.
x) Increasing Utilization of the Existing transmission lines through Uprate & Upgrade.
xi) Use with HTLS conductors and some special conductors.
xii) Use of micro pile foundation and special type tower design.

F) Mitigation of ROW

i)Transmission line projects have some location impact on the villagers whose lands are affected for construction of transmission towers and stringing of conductors and on the natural resources like crops and trees wherever the Transmissions line passes through the agricultural land and forest area. Thus the main strategy /focus would involve undertaking the activities that benefit the persons/villagers, generally impacted by the activities that will help to

reverse any adverse impact on the environment and ecology so transmission license implement the CSR (Corporate Social Responsibility) like distributing the medicines and conducting Health Checkup camps regularly as well as supporting the women empowerment and education system as well as various charity work in ROW affected area on voluntarily basis.

ii)Encouraging Land Owners to cultivate low growth trees below tree meters like Fruit and flowers instead of bamboo /Long tree in line. The farmers will get the extra income and fruitful relationship with Transmission licensee.

iii) The utilities deputing some local officer as a Tower Mitra to mitigate the ROW & educate the villagers regarding the Usefulness of the Transmission system and its safety.

iv)ROW can be mitigated by adapting New Innovative Technologies.

v) The Construction work is to be planned in off season when their is no standing crop.

vi) The various ROW is to be resolved with the involvement of third party with specific conditions.

vii) The maximum cases shall be taken in fast track court or in Lok Adalat.

CONCLUSIONS: -

Demand growth is increasingly driven by residential and commercial sector, with fast growing cities & increasing urbanization. Building new transmission infrastructure to meet peak demand is extremely difficult due to high population density and Right of Way (RoW) challenges. With the strong emphasis on renewable energy sources which are mostly located in remote areas, their integration to the grid requires massive transmission infrastructure and that too, in a shorter time frame. Getting RoW for transmission lines is becoming increasing difficult & very serious concern for Transmission Companies. As land owners demand enhanced compensation payment because of their ulterior motive guided by greed and for unlawful pecuniary gain, all the matters are to be taken by District Courts & further to High Court/Supreme Court/APTEL. The new Guidelines issued by MOP in 2015 plays a very crucial role to mitigate the ROW issues in Construction phase by paying the tower base land value and corridor land value after confirming their ownership and available circle rate. Transmission lines are constructed under the ambit of the Electricity Act,2003 with provision stipulated in Sec 67-68 read with section 10 to 16 of the Telegraph act before Oct'2015 don't have the provision for the land compensation so new guidelines will be the game changer to resolve the ROW and early completion of the Transmission line corridors. The various innovative technology and measures are being implemented by transmission companies for mitigation of ROW.

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ii) IS Code 5613.

iii) Electrical Power system Book by C.L.Wadhava.

iv) CBIP Transmission Line Manual.

v) Indian Electricity Act-2003 & Telegraph Act-1885.

vi) Guide lines issued by The Ministry of Power, Govt. of India vide letter no 3/7/2015 Trans dated 15.10.2015.

vii) Guidelines for payment of compensation in Regards to Right of Way (ROW) for transmission line in Urban area dated 16.07.2020.

Authers Snapshot :-

Sh Shri Rajesh Gupta is a Graduate Electrical Engineer from Delhi College of Engineering and also holds an MBA from FMS, Delhi University.

He has valuable experience of 34 years in different facets of Power Sector. He has worked in various capacities in NTPC and POWERGRID in the areas of design & optimisation, construction, operation & maintenance, project management and consultancy assignments of many EHV AC & HVDC transmission projects. He was one of the key members in various domestic as well as international consultancy assignments with Nepal, Kenya, Ethiopia, Tajikistan under World Bank/ADB funded projects. He has co-authored technical papers in various National and International forums.

He has been appointed as a NETCL Director on our Board with effect from 29th September 2021.

Mr. Harshal Malewar is a graduate in Electrical Engineering from Govt. College of Engineering Chandrapur (GCOEC) in 2006, Maharashtra, Nagpur in 2006 & has correspondence MBA in Power Management in 2010. He is Certified Chartered Engg from Institute of Engineers India. He has diversified experience of more than 15 years in the Power Transmission & Distribution with various power sector companies such as RECTPCL, MSETCL, Sunflag Steel & Power, Jyoti Structures Ltd and Currently working in NETCL (POWERGRID & OTPC JV). He has good exposure in Project Monitoring, Contracts & Procurement, Project Management, O &M and Construction of EHV Substations & Lines. He has authored & co-authored technical papers in various National and International forums like CBIP, CIGRE & Published papers on national journals of power sector. He is working as Deputy Manager in NETCL (JV of POWERGRID & OTPC).