Task 2

Report

By

Anshul Singh

Research intern-Inspect

Aerial Inspection

Aerial Inspection is a process of inspecting various image data collected with the help of different types of UAVs/Drones and sensors at different places for better analysis and working of that field. Aerial inspection can provide information on many things not visible from ground.

Aerial Inspection is used in different fields such as:

1. Mining
2. Geographical Survey's
3. Self-Driving Cars
4. Agriculture
5. Large-Scale Area
6. Project Surveillance

Concept Used in Aerial Inspection:

The primary concepts that are used in aerial inspection are as follows:

1. UAVs
2. Image processing(for visual data)
3. Annotation
4. Computer Vision
5. Concepts of Machine learning
6. Data Analysis
7. Supervision system
8. Communication system

TOWER

Tower can be state as a building or a structure which is higher than its diameter and highly related to its surroundings that may be stand apart or stay together with a larger structure.

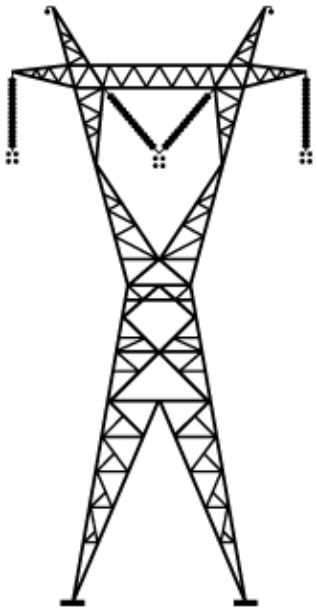
Different Types of Tower

There are different types of telecom tower. They are:

1. Waist-type tower
2. Double circuit Tower
3. Guyed Tower
4. Tublar steel pole
5. Guyed cross-rope suspension tower
6. Crossing

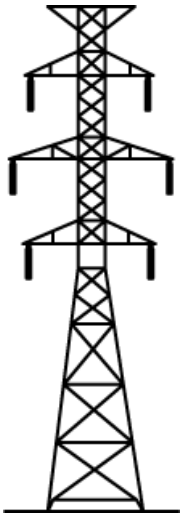
1. Waist-type tower :

This is the most common type of transmission tower. It's used for voltages ranging from 110 to 735 kV. Because they're easily assembled, these towers are suitable for power lines that cross very uneven terrain.



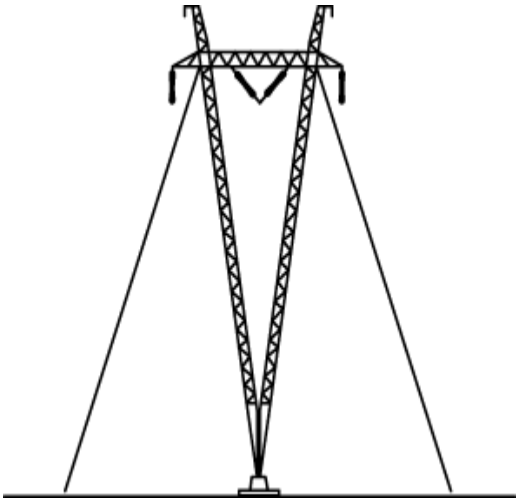
2. Double-circuit tower

This small-footprint tower is used for voltages ranging from 110 to 315 kV. Its height ranges from 25 to 60 metres.



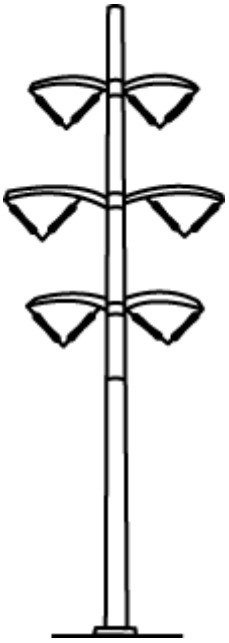
3. Guyed-V tower

This tower is designed for voltages ranging from 230 to 735 kV. It's used mainly for power lines leaving the La Grande and Manic-Outardes hydroelectric complexes. The guyed-V tower is more economical than the double-circuit and waist-type towers.



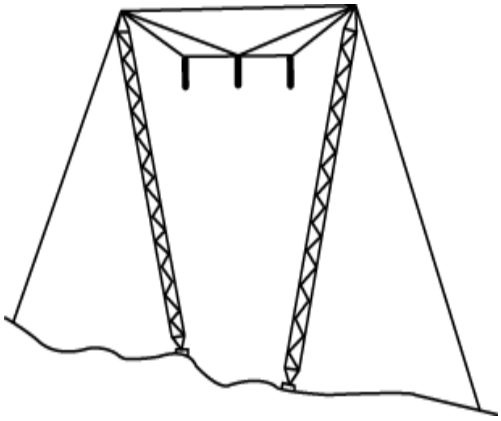
4. Tublar steel pole:

Featuring a streamlined, aesthetic shape, this structure is less massive than other towers, allowing it to blend easily into the environment. For this reason, it's being used more and more in urban centers.



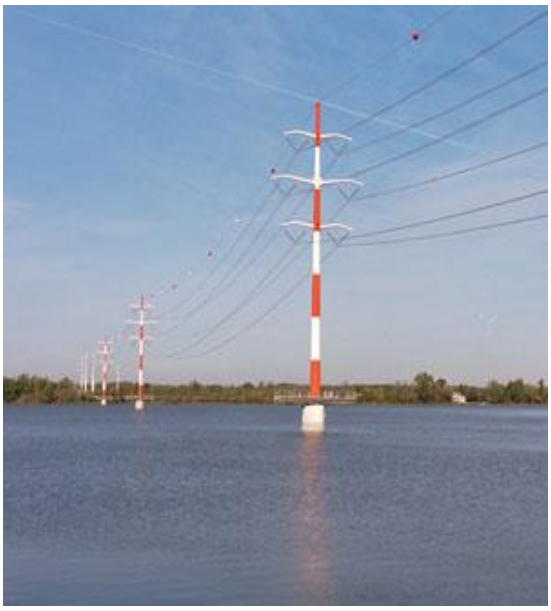
5. Guyed cross-rope suspension tower:

With its simple design, this tower is easy to assemble. It's used on some sections of power lines leaving the La Grande complex and supports 735-kV conductors. This type of structure requires less galvanized steel than the guyed-V tower, making it lighter and less costly.



6. Crossing

Used when overhead power lines must cross large water bodies.



Electric Tower

Electric towers are tall metal structure which holds electric cables high above the ground which enables the electricity to flow over long distances. Electric Tower are also called Electricity Pylons**.**

Types of Electricity Pylons

There are basically 3 types of pylons are there by function:

1. Anchor Pylon
2. Branch Pylon
3. Tension Pylon

1. Anchor Pylon:

Anchor pylons or strainer pylons are hired at branch locations as branch pylons and must appear at a maximum distance of 5 km, due to technical limitations in the conductor length.

2. Branch Pylon:

Branch pylon is a pylon that is used to start a line branch. The branch pylon is responsible for holding up both the main-line and the start of the branch line, and must be structured so as to resist forces from both lines.

3. Tension Pylon:

A tension tower with phase transposition of a traction current line for single phase AC 110 kV, 16.67 Hz.

Tower Inspection with drone

Communication companies with cell and radio towers, cities with electric towers, and other industries that use towers as part of their daily operations—all of these towers require regular maintenance, and before the maintenance work can be done, a preliminary survey must be conducted to determine where to work.

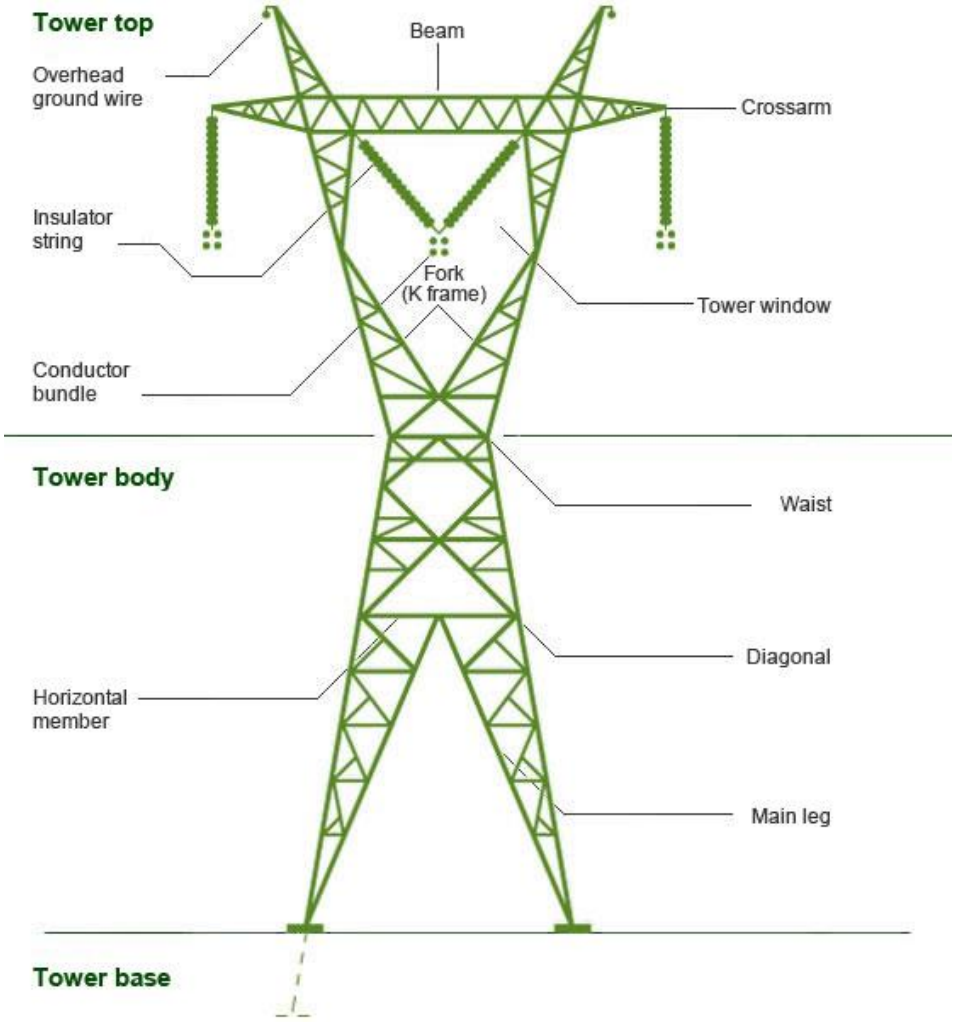
- In tower surveys, a drone can help identify potential climbing hazards, find structural damage, and help tower inspectors understand the tools they need prior to climbing.
- Once this information has been gathered, a tower inspector can follow up and address the issues revealed in the data, if any.
- Drone surveys serve to reduce the amount of time personnel are on the tower, increasing their efficiency and keeping them safe.

USE CASES

- We have to check for environmental or other hazard before climbing. The hazards could be bees, birds, structural damage etc.
- We have to identify damaged areas
- Pre work inspection helps to determine the tools and parts which are required for the fixing of the tower. This avoids the time which is wasted by returning to ground to find the best tool
- In case of structural emergency, we can investigate the structure's integrity before we climb.
- We can check whether it is safe to climb or not

Components of a Tower

The components of tower can be seen in the image below:



Hazards/risks while doing tower inspection:

Telecommunications towers, for example those used for cell phone communication as well as electric tower, require regular and thorough inspection and maintenance. While necessary, these inspections carry a high level of risk, particularly to inspectors who must scale these towers to gather the necessary data.

Some of the risks are:

1 Falling from height risk
2 Electric shock risk
3 Unwanted weather changes risk
4 Equipment failure
5 Structural collapse