Presentation on towers
Power System I

Definition

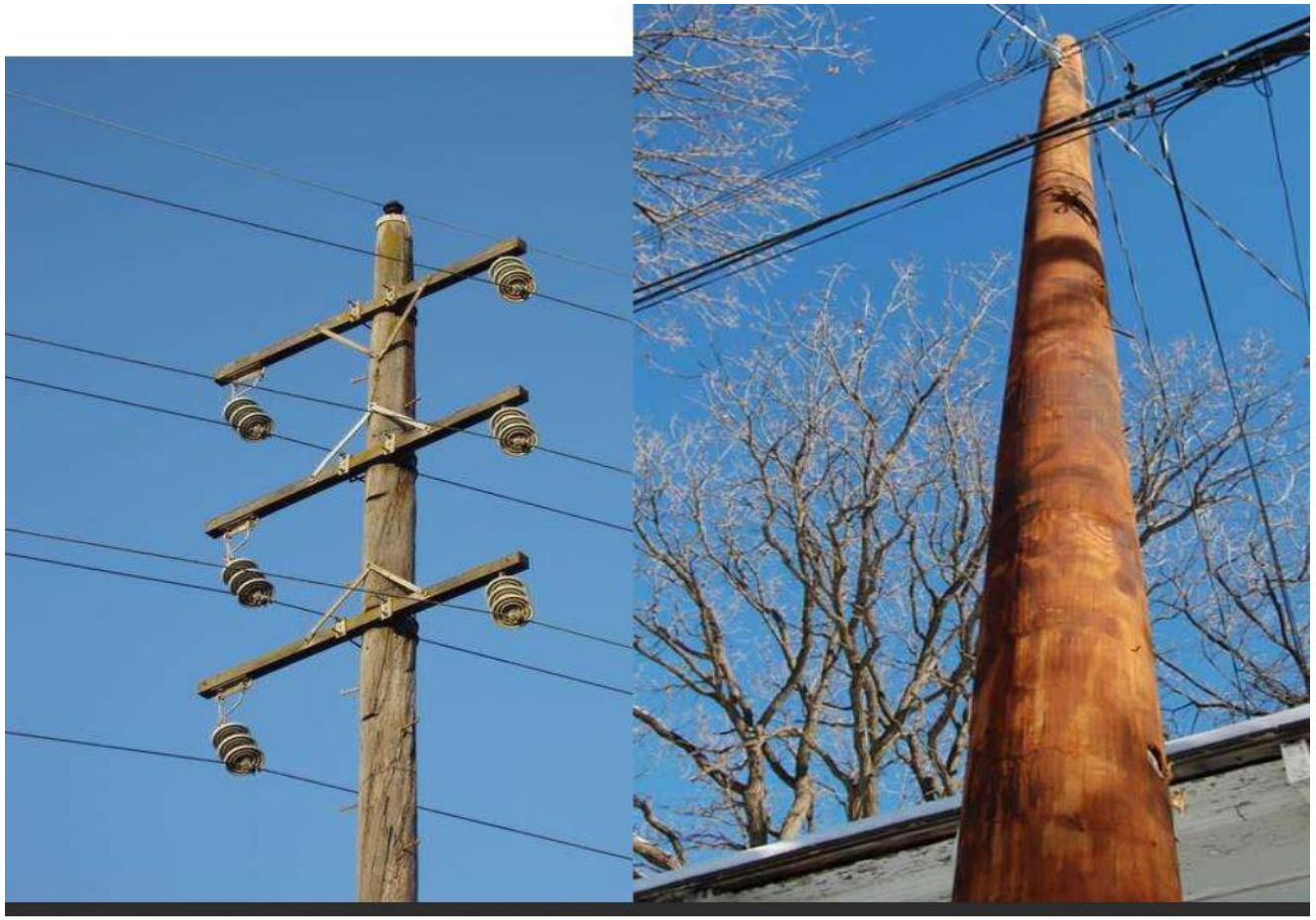
A Transmission tower or a pole is a structure used to support an overhead power line.

- Used high-voltage AC and DC systems
- Height range from 15 to 55 metres

Types

- Wooden poles
- RCC poles
- Steel tubular poles
- Steel tower

Wooden Towers



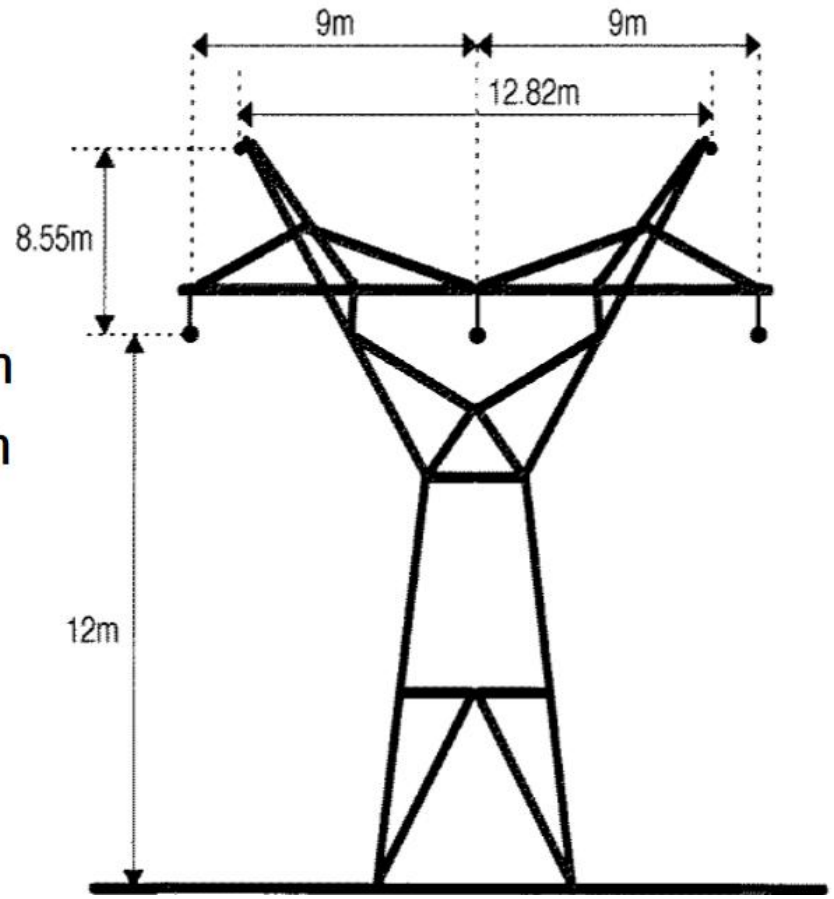
RCC Poles

Steel Tubuler pole

Steel Towers

Tower Design

- Tower height
- Base width
- Top damper width
- Cross arms length



Advantages and Disadvantages of different type of towers

- Advantages

  Design flexibility, high strength, light weight, long life, reduced maintenance costs, no damage due to fire Reduction in theft of energy.

- Disadvantages

  High cost

  Tubular poles designed to very difficult

  Tubular poles may be difficult to climb

  Wooden pole damage due to fire

  20kv above voltage don't use wooden poles

Safety measures

- ALL LIFTING TOOLS SHOULD BE LOAD TESTED AS PER STANDARD.
- WHILE LOADING AND UNLOADING THE TOWER PARTS
- Be CARE FULLY AVOID ALL TOWER ERECTION IN RAINY DAY.

References

http://stockarch.com/files/imagecache/Preview/11/05/power_cables.jpg

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Presentation
on
Insulators

Definition

Transmission line insulators are devices used to contain, separate or support electrical conductors on high voltage electricity supply networks.

Transmission insulators come in various shapes and types, including individual or strings of disks, line posts or long rods.

They are made of polymers, glass and porcelain--each with different densities, tensile strengths and performing properties in adverse conditions

Types

There are several types of insulators but the most commonly used are:

- pin type
- suspension type
- strain insulator
- shackle insulator
- Egg Type

Pin Type Insulator

As the name suggests, the pin type insulator is secured to the cross-arm on the pole. There is a groove on the upper end of the insulator for housing the conductor. The conductor passes through this groove and is bound by the annealed wire of the same material as the conductor.

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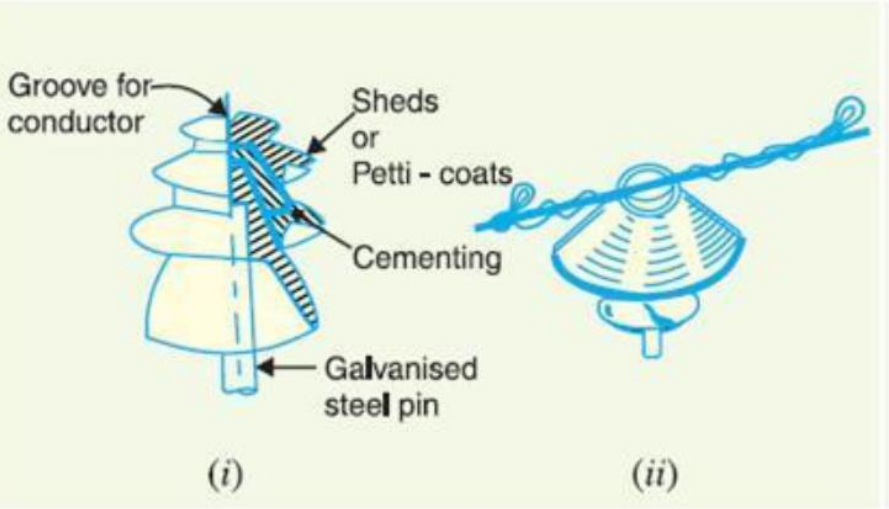
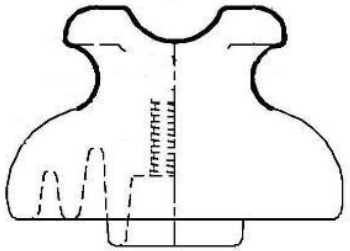
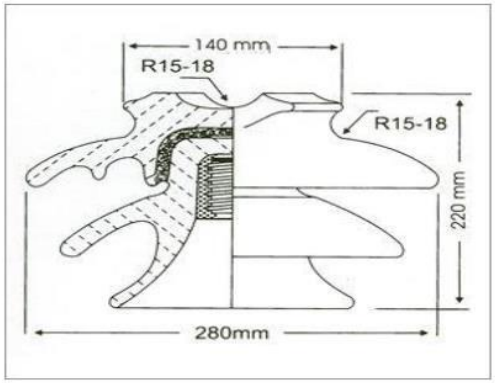
Pin type insulators are used for transmission and distribution of electric power at voltages upto 33 kV. Beyond operating voltage of 33 kV, the pin type insulators become too bulky and hence uneconomical.







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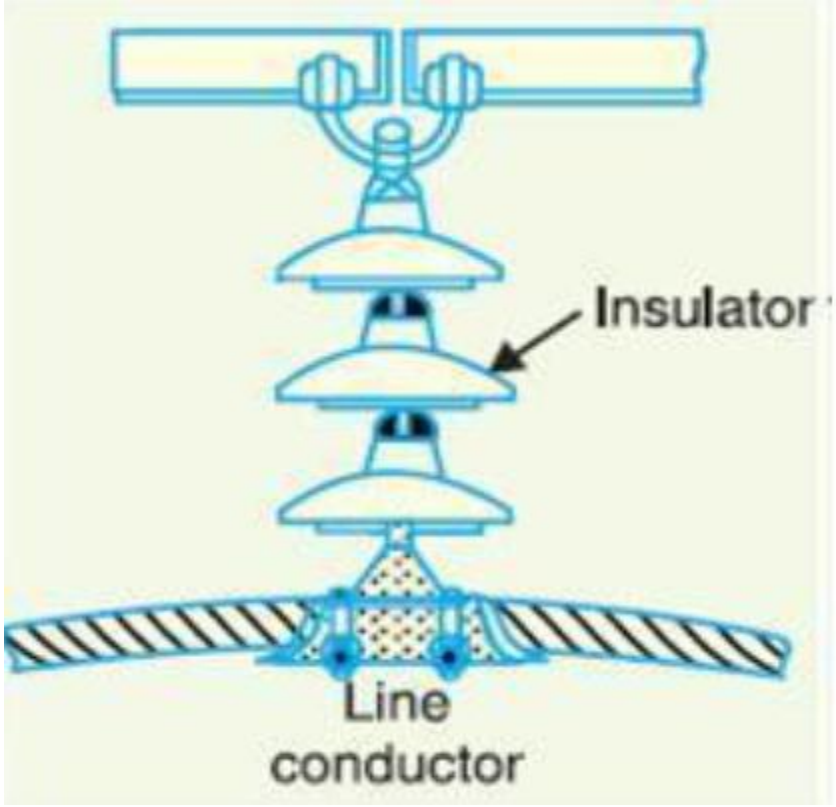
- Pin type insulators are used for the transmission of lower voltages. A single pin type insulator is used to transmit voltages up to 11 kV (kilovolts) and higher voltages require two-, three- or four-piece pin insulators. They are not economically feasible for 33 kV and higher transmission lines.
- Pin type insulators are secured with steel or lead bolts onto transmission poles. These are typically used for straight-running transmission lines

Suspension Type Insulator

- For high voltages (>33 kV), it is a usual practice to use suspension type insulators shown in Figure. consist of a number of porcelain discs connected in series by metal links in the form of a string.



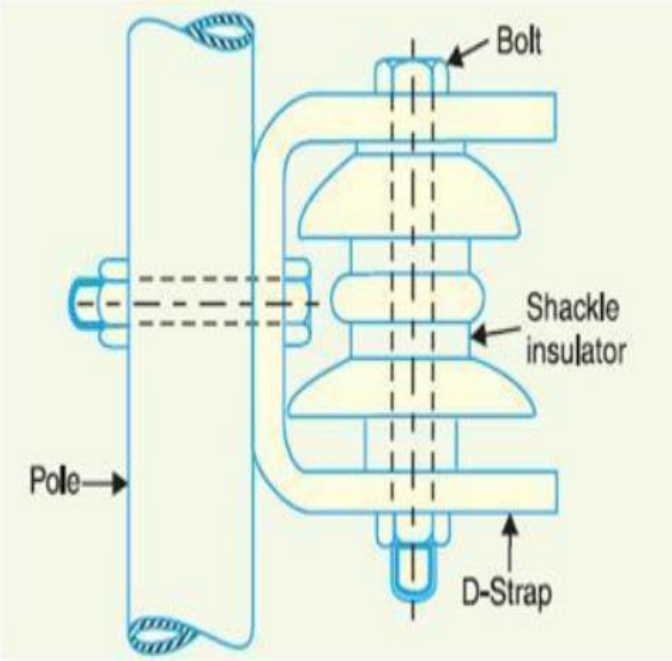
Strain Type Insulator

STRAIN INSULATOR

When there is a dead end of the line or there is corner or sharp curve, the line is subjected to greater tension. In order to relieve the line of excessive tension, strain insulators are used. For low voltage lines (< 11 kV), shackle insulators are used as strain insulators.

Shackle type insulators, similar to strain type insulators, are used on sharp curves, end poles and in section poles.

However, unlike strain insulators, shackle insulators are designed to support lower voltages. These insulators are single, round porcelain parts that are mounted horizontally or vertically. In early days, the shackle insulators were used as strain insulators.



Stay or Egg type Insulator

Stay insulators, also called egg insulators, are primarily used to prevent stay wires from becoming energized from accidentally broken live wires. They, therefore, function to provide insulation between stay clamps and transmission poles. Stay insulators are mounted at a height of at least 3 meters (118 inches) from ground level.

References

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