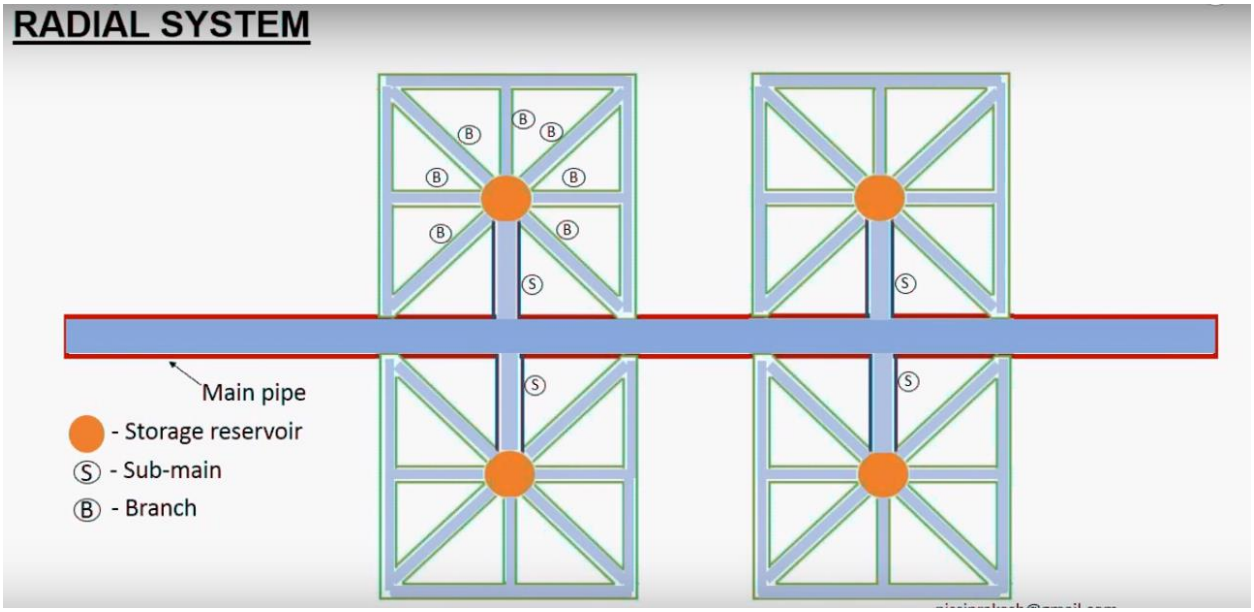
These are the four distribution feeder systems we have to speak about

1. **Radial**
2. **Parallel feeders**
3. **Ring main**
4. **Meshed system**

The Advantage and the disadvantage of radial and ring distribution systems



Advantages of the radial distribution system

- Simplest as fed at only one end.
- The initial cost is low.
- It is useful when the generating is at low voltage.
- Preferred when the station is located at the center of the load.
- More economical for some areas which have a low load requirement
- require less amount of cables
- It has a low maintenance

Disadvantages of the radial distribution system

- the end of distributor near to the substation gets heavily loaded.

• When load on the distributor changes, the clients at the distant end of the distributor face serious voltage fluctuations.
• As users are dependent on single feeder and distributor, a fault on any of these two causes interruption in supply to all the users connected to that distributor

Advantages of the ring distribution system

• In ring power is supplied from both ends as compared to radial
• In case of a fault in the radial circuit the entire system goes off unlike in ring where by in case one end gets a fault the other end still keeps on supplying power
• Compared to the radial system, the voltage drop is less along the distribution line
• More subscribers can be installed to the system than the radial system
• Less voltage fluctuations can be seen at client's terminals. Voltage fluctuations in high loaded areas can be reduced using a tie line

Disadvantages of the ring distribution system

• Ring is very expensive n requires more materials than radial
• Radial circuit is more economical
• High maintenance cost
• It is not usable when the client is located at the center of the load

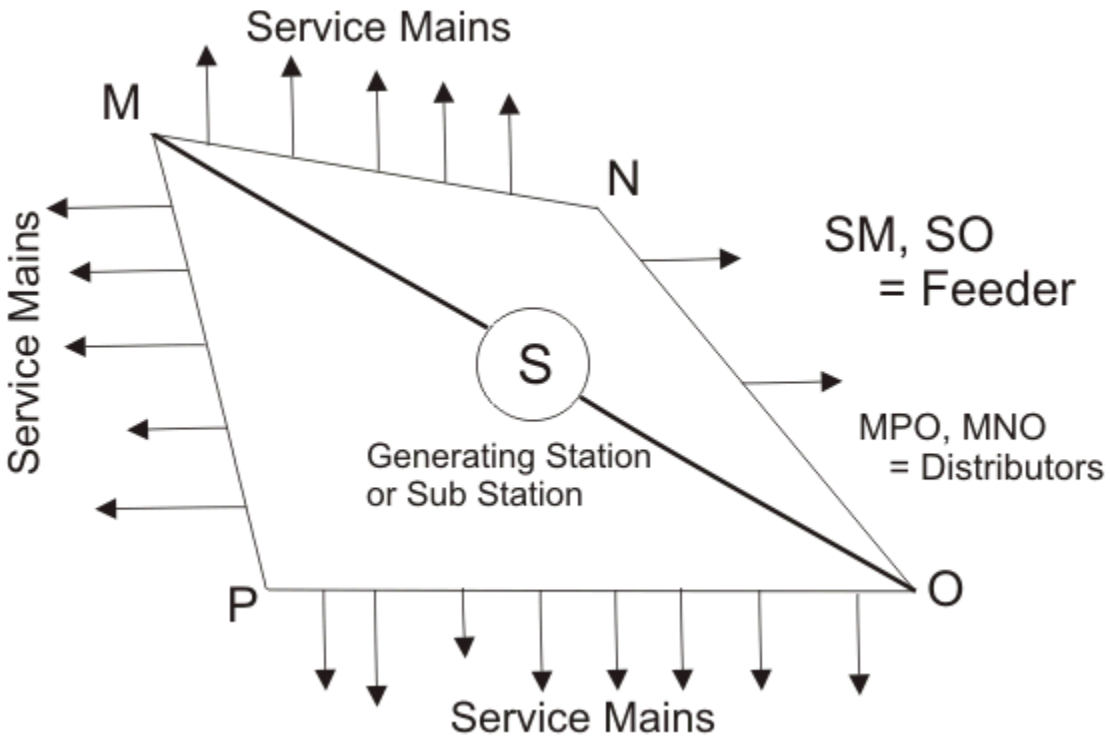
Electrical Power Distribution System

The main function of an **electrical power distribution system** is to provide power to individual consumer premises. Distribution of electric power to different consumers is done with much low voltage level. Distribution of electric power is done by distribution networks. Distribution networks consist of following main parts

1. Distribution substation,

2. Primary distribution feeder,
3. Distribution Transformer,
4. Distributors,
5. Service mains.

The transmitted electric power is stepped down in substations, for primary distribution purpose. Now these stepped down electric power is fed to the distribution transformer through primary distribution feeders. Overhead primary distribution feeders are supported by mainly supporting iron pole (preferably rail pole). The conductors are strand aluminum conductors and they are mounted on the arms of the pole by means of pin insulators. Some times in congested places, underground cables may also be used for primary distribution purposes.

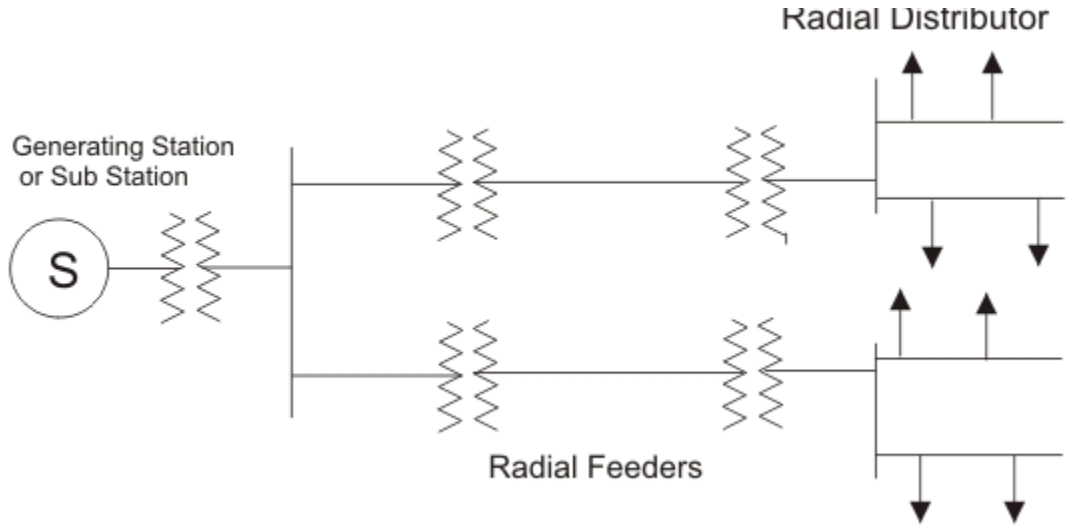


Distribution transformers are mainly 3 phase pole mounted type. The secondary of the transformer is connected to distributors. Different consumers are fed electric power by means of the service mains. These service mains are tapped from different points of

distributors. The distributors can also be re-categorized by distributors and sub distributors. Distributors are directly connected to the secondary of distribution transformers whereas sub distributors are tapped from distributors. Service mains of the consumers may be either connected to the distributors or sub distributors depending upon the position and agreement of consumers. In this discussion of **electrical power distribution system**, we have already mentioned about both feeders and distributors. Both feeder and distributor carry the electrical load, but they have one basic difference. Feeder feeds power from one point to another without being tapped from any intermediate point. As because there is no tapping point in between, the current at sending end is equal to that of receiving end of the conductor. The distributors are tapped at different points for feeding different consumers; and hence the current varies along their entire length.

Radial Electrical Power Distribution System

In early days of electrical power distribution system, different feeders radially came out from the substation and connected to the primary of distribution transformer.

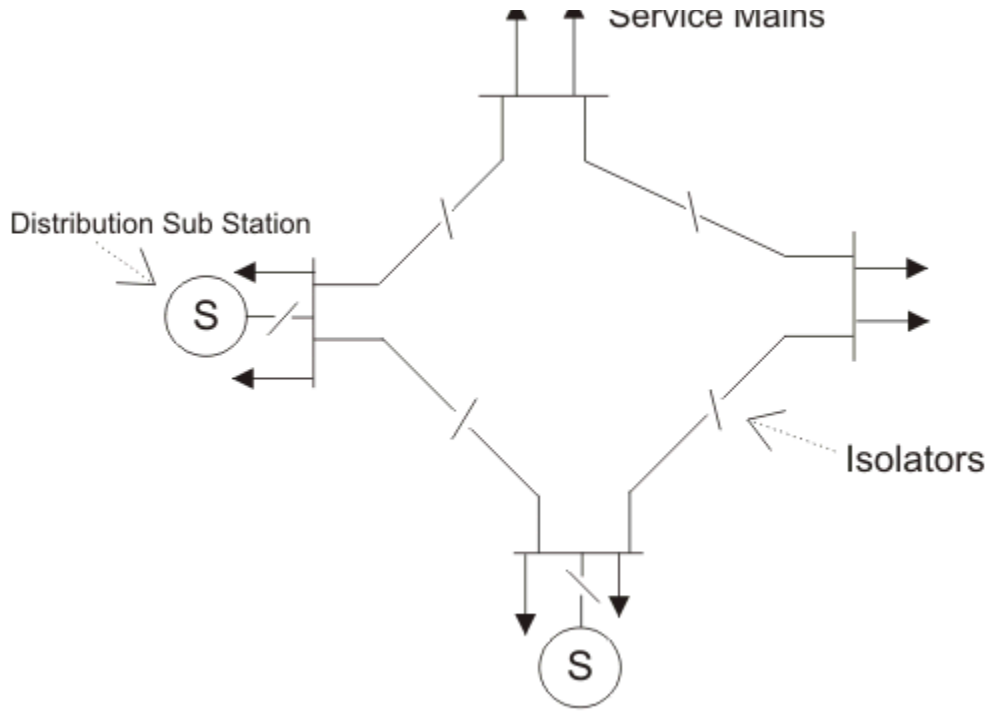


But **radial electrical power distribution system** has one major drawback that in case of any feeder failure, the associated consumers would not get any power as there was no alternative path to feed the transformer. In case of transformer failure also, the power

supply is interrupted. In other words the consumer in the radial electrical distribution system would be in darkness until the feeder or transformer was rectified.

Ring Main Electrical Power Distribution System

The drawback of **radial electrical power distribution system** can be overcome by introducing a **ring main electrical power distribution system**. Here one ring network of distributors is fed by more than one feeder. In this case if one feeder is under fault or maintenance, the ring distributor is still energized by other feeders connected to it. In this way the supply to the consumers is not affected even when any feeder becomes out of service. In addition to that the ring main system is also provided with different section isolates at different suitable points. If any fault occurs on any section, of the ring, this section can easily be isolated by opening the associated section isolators on both sides of the faulty zone transformer directly.



In this way, supply to the consumers connected to the healthy zone of the ring, can easily be maintained even when one section of the ring is under shutdown. The number of feeders connected to the **ring main electrical power distribution system** depends upon the following factors.

1. Maximum Demand of the System: If it is more, then more numbers of feeders feed the ring.
2. Total Length of the Ring Main Distributors: It length is more, to compensate the voltage drop in the line, more feeders to be connected to the ring system.
3. Required Voltage Regulation: The number of feeders connected to the ring also depends upon the permissible allowable, voltage drop of the line.

The sub distributors and service mains are taken off may be via distribution transformer at different suitable points on the ring depending upon the location of the consumers. Sometimes, instead of connecting service main directly to the ring, sub distributors are also used to feed a group of service mains where direct access of ring distributor is not possible.