

## 5.1 DISTRIBUTION SYSTEMS – GENERAL ASPECTS

The electrical energy produced at the generating station is conveyed to the consumers through a network of transmission and distribution systems. It is often difficult to draw a line between the transmission and distribution systems of a large power system. It is impossible to distinguish the two merely by their voltage because what was considered as a high voltage a few years ago is now considered as a low voltage. In general, distribution system is that part of power system which distributes power to the consumers for utilization.

The transmission and distribution systems are similar to man's circulatory system. The transmission system may be compared with arteries in the human body and distribution system with capillaries. They serve the same purpose of the ultimate consumer in the city with the life-giving blood of civilization—electricity. In this chapter, we shall confine our attention to the general introduction to distribution.

### 5.1.1 Distribution System

That part of power system which distributes electric power for local use is known as distribution system. In general, the distribution system is the electrical system between the substation fed by the Transmission system and the consumer's meters. It generally consists of feeders, distributors, and service mains. Fig. 12.1 shows the single line diagram of a typical low tension distribution system.

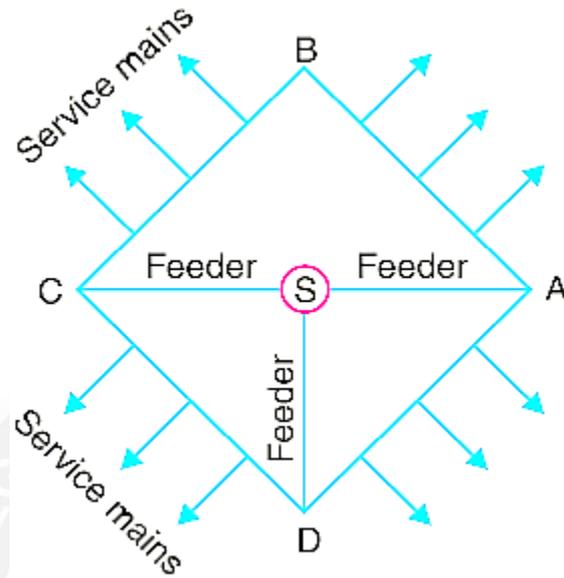
#### i) Feeders

A feeder is a conductor which connects the sub-station (or localized generating station) to the area where power is to be distributed. Generally, no tappings are taken from the feeder so that current in it remains the same throughout. The main consideration in the design of a feeder is the current carrying capacity.

#### (ii) Distributor

A distributor is a conductor from which tappings are taken for supply to the consumers. In Fig. AB, BC, CD and DA are the distributors. The current through a distributor is not constant because tappings are taken at various places along its length. While designing a distributor, voltage drop along its length is the main consideration

since the statutory limit of voltage variations is  $\pm 6\%$  of rated value at the consumers' terminals.



**Figure 5.1 Distribution System**

[Source: "Principles of Power System" by V.K.Mehta Page: 301]

(iii) Service mains

A service mains is generally a small cable which connects the distributor to the consumers' terminals