

## **Topic: Electric Power Systems**

### **Paraphrasing and summarising**

#### **A. Paraphrase the following text keeping in mind that:**

- a. The length of your text should be approximately the same length as the original.**
- b. The meaning of your text should be the same as that of the original.**

"Electric power can be easily and efficiently transported to locations far from production centres and converted into desired forms. Therefore, electric power can satisfy the requirements of a variety of users widely spread around the intended territory".

Saccomanno, F. *Electric Power Systems. Analysis and control*. Wiley-IEEE Press: Hoboken, NJ, 2003, p. 2.

#### **B. Write a simple definition of an Electric Power System by using appropriate information from the following excerpt.**

##### **Excerpt 1**

"An electric power system is a network of electrical components used to supply, transfer and use electric power. An example of an electric power system is the network that supplies a region's homes and industry with power—for sizeable regions. This power system is known as the grid and can be broadly divided into the generators that supply the power, the transmission system that carries the power from the generating centres to the load centres and the distribution system that feeds the power to nearby homes and industries. Smaller power systems are also found in industry, hospitals, commercial buildings and homes. The majority of these systems rely upon three-phase AC power—the standard for large-scale power transmission and distribution across the modern world. Specialised power systems that do not always rely upon three-phase AC power are found in aircraft, electric rail systems, ocean liners and automobiles.

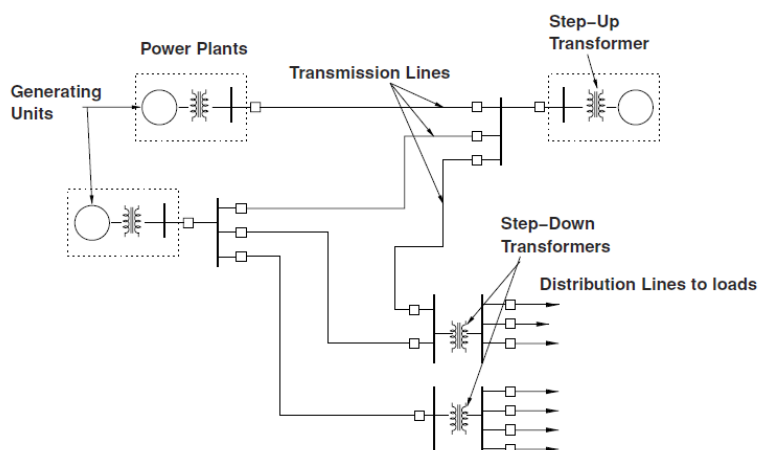


Figure 1.1 Cartoon of a simple power system

Electric power originates in 'power plants'. It is transmitted by 'transmission lines' from the power plants to the loads. Along the way the voltage is first stepped up by transformers, generally within the power plants, from a level that is practical for the generators to a level that

provides adequate efficiency for long-distance transmission. Then, near the loads the electric power is stepped down, also by transformers, to a voltage useable by the customer.

This picture is actually quite simplified. In modern utility systems there are thousands of power plants connected together through networks and many more connections to loads than are indicated in Figure 1.1. The connections to actual loads are usually more like what is shown in Figure 1.2. At the distribution level the connection is 'radial', in that there is one connection from the source of electric power (the 'grid'), and that is broken down into many load connections. Usually the distribution primary line is at a voltage level intermediate between the transmission level and the voltage that is actually used by customers".

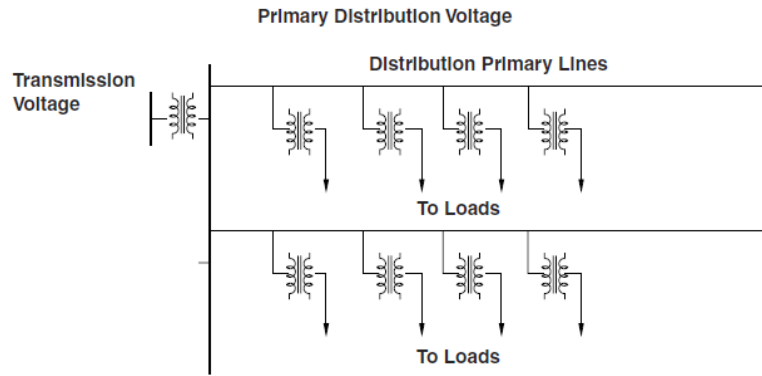


Figure 1.2 Distribution circuits

Kirtley, J. L. *Electric Power Principles. Sources, conversion, distribution and use*. Wiley: Chichester, U.K. 2010, pp. 2-3