

UNIT – 1**GENERATION SYSTEMS**

Energy is the basic necessity for the economic development of a country. Energy exists in different forms in nature but the most important form is the electrical energy. The modern society is so much dependent upon the use of electrical energy that it has become a part and parcel of our life. Electrical energy is superior to all other forms of energy due to the following reasons:

- + Convenient form
- + Easy control
- + Greater flexibility
- + Cheapness
- + Cleanliness
- + High transmission efficiency

Sources of Energy

Electrical energy is produced from energy available in various forms in nature. It is desirable to look into the various sources of energy. These sources of energy are:

- the Sun
- the Wind
- Water
- Fuels
- Nuclear energy.

Units of Energy

Mechanical Energy – Newton-metre or joule

Electrical Energy – kWh (kilowatt hour)

$$1 \text{ kWh} = 36 \times 10^5 \text{ joules}$$

Bulk electric power is produced by special plants known as generating stations or power plants. A generating station essentially employs a prime mover coupled to an alternator for the production of electric power as shown in fig.1.1.

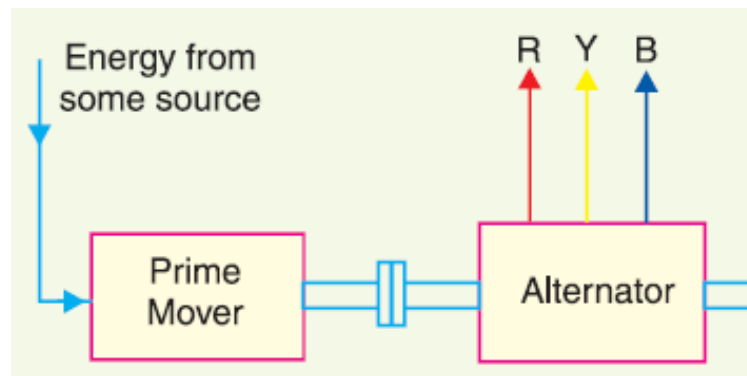


Fig 1.1 Electricity generation arrangement

(Source: 'Principles of power system,' V.K.Mehta, Rohit Mehta)

Depending upon the form of energy converted into electrical energy, the generating stations are classified as under:

- a. Coal based thermal power stations
- b. Hydroelectric power stations
- c. Diesel power stations
- d. Nuclear power stations