

**Eg:** For 2000MW plant, the land requirement may be of the order of 200-250 acres. As the cost of the land adds up to the final cost of the plant, it should be available at a reasonable price. Land should be available for future extension.

- **Transportation Facilities:** The facilities must be available for transportation of heavy equipment and fuels e.g near railway station.
- **Labour supplies:** Skilled and unskilled laborers should be available at reasonable rates near the site of the plant.
- **Ash Disposal:** Ash is the main waste product of the steam power plant and with low grade coal, it may be 3.5 tones per day , some suitable means for disposal of ash should be thought of. It may be purchased by building contractors, or it can be used for brick making near the plant site. If the site is near the coal mine it can be dumped into the disused mines. In case of site located near a river,sea or lake ash can be dumped into it.
- **Distance from populated area:** The continuous burning of coal at the power station Produces smoke, fumes and ash which pollute the surrounding area. Such a pollution due to smoke is dangerous for the people living around the area. Hence, the site of a plant should be at a considerable distance from the populated area.

### **Major Components of a Thermal Power Plant**

- **Coal Handling Plant**
- **Pulverizing Plant**
- **Draft or Draught fan**
- **Boiler**
- **Ash Handling Plant**
- **Turbine and Generator**
- **Condenser**
- **Cooling Tower And Ponds**
- **Feed Water Heater**
- **Economiser**

- **Super heater and Reheater**
- **Air pre heater**
- **Alternator with Exciter**
- **Protection and control equipment**
- **Instrumentation**

## **BOILER**

- ❖ A boiler (or steam generator) is a closed vessel in which water, under pressure, is converted into steam. The heat is transferred to the boiler by all three modes of heat transfer i.e. conduction, convection and radiation.
- ❖ Major types of boilers are: (i) fire tube boiler and (ii) water tube boiler
- ❖ Generally water tube boilers are used for electric power stations.

### **Fire Tube Boiler**

- The boiler is named so because the products of combustion pass through the tubes which are surrounded by water.
- Depending on whether the tube is vertical or horizontal the fire tube boiler is divided into two types
  1. Vertical tube boiler
  2. Horizontal tube boiler
- A fire tube boiler is simple, compact and rugged in construction. Its initial cost is low.
- Water being more and circulation being poor they cannot meet quickly to changes in steam demand.
- As water and steam, both are in the same shell, higher pressure of steam are not possible, the maximum pressure which can be had is  $17.5 \text{ kg/cm}^2$  with a capacity of 15,000kg of steam per hour.

