- **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

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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 kg/cm^2 with a capacity of 15,000kg of steam per hour.

- For the same output the outer shell of a fire tube boiler is much larger than that of a water tube boiler.

- In the event of a sudden and major tube failure. Steam explosions may be caused in the furnace due to rush of high pressure water into the hot combustion chamber which may generate large quantities of steam in the furnace.

- Fire tube boilers use is therefore limited to low cost small size and low pressure plants.

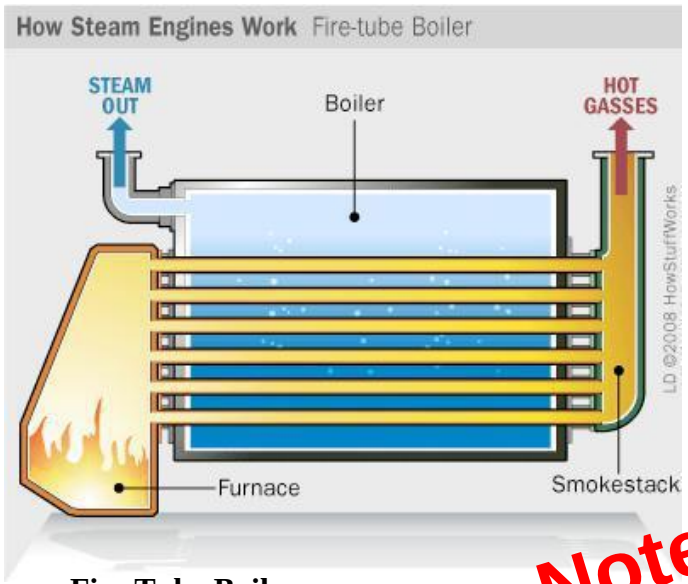

Figure : Fire Tube Boiler

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<u>Water Tube Boilers</u>

- In this boiler, the water flows inside the tubes and hot gases flow outside the tube .

- Water tube boiler are classified as

    1. Vertical tube boiler
    2. Horizontal tube boiler
    3. Inclined tube boiler

- The circulation of water in the boiler is may be natural or forced.

- For Central steam power plants large capacity of water tube boilers are used.

- The tubes are always external to the drum they can be built in smaller size and therefore withstand high pressure.

- The boiler drum contains both steam and water, the former being trapped from the top of the drum where the highest concentration of dry steam exists.