



### ECONOMISER :-

(27)

It is a mechanical device which preheats the fluid to reduce energy consumption by means of heat exchangers. In a steam boiler, it is a heat exchanger device which heats up fluid (or) recover residual heat from the combustion product.

The feed water from the feed tank is supplied to the economizer. The economizer used in a boiler preheats the feed water, then it is supplied to the economizer by a feed pump. The economizer is used to preheat the water before it is going to the boiler.

Generally, the flue gases passed through the main boiler and the superheater will be in hot condition. The heat energy present in the flue gases can properly be used to improve thermal efficiency of the boiler.

The feed water is pumped to the economizer through a heat exchanger, so the feed water comes to the boiler at high temperature. The heat required to raise the steam become less.



## AIR PRE-HEATER :-

It is a device used to heat air before performing another process. The location of air preheater is just before chimney. It helps to increase the thermal efficiency of the process. The preheater can be used by alone (or) to replace the steam used.

### Types :-

1. Tubular type.
2. Regenerative Air Preheater.

#### 1) Tubular type :-

It is built into the boiler flue gas duct. It consists of the straight tube bundles which pass through the outlet duct of the boiler. It can be opened at each end outside of the ducting. Inside the duct, the hot furnace gases pass around the preheater tubes. They transfer the heat from the exhaust gas to the air inside the preheater. Ambient air is forced by a fan through duct at one end of the preheater tubes and at other end, the heat air from inside the tubes emerges into another set of duct.

#### 2) Regenerative air preheaters :-

The partial amount of steam is bled and supplied to the heat exchanger and the heat energy present in the bled steam is supplied to air preheater which is similar to regenerator used in Rankine cycle. It has two types as follows.

- i) rotating - plate regenerative air preheaters
- ii) stationary - plate regenerative air preheaters.