



ATTACHMENT OF PRE-HEATING SYSTEM USING EXHAUST STEAM OF TURBINE TO FEED WATER, FOR THERMAL POWER PLANT

Yemjala Raghu

Dept of mechanical engineering,
Sreenidhi institute of science and technology,
Hyderabad, Telangana, India.

Abstract: In the fore forward generation, the utility of electricity was increasing rapidly due to the usage of many equipment's to full fill the needs of human beings in their daily life. By remembering the usage of power, I made an advancement in the generation process where power was developed by means of thermal power plant which generate energy in the form of electricity, where the world was running through this medium to work.

In this paper I made an attachment of pre heating system to the water intake system to pre heat the water (to raise the temperature of water intake) by means of steam come out from the turbine this helps to utilize maximum amount of heat generated in the system. Due to this external equipment's working will be going to decrease like work for condenser as well as cooling tower were going to increase their life by means of this advancement.

1. Introduction

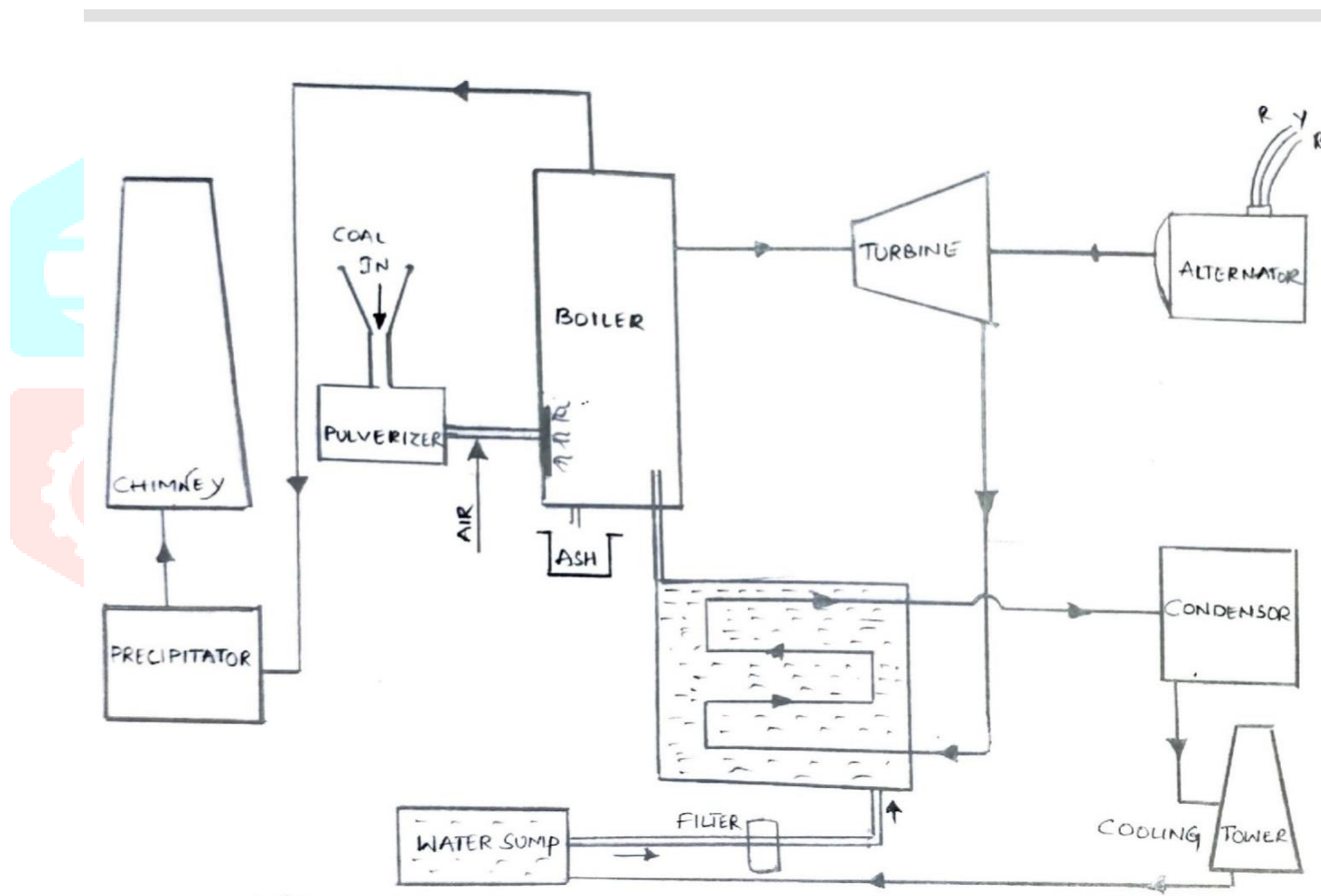
In general, we all well known about how thermal power plant works, like the raw material is feed into the furnace I.e., coal which is used for heating the boiler consisting of water in it to convert the liquid phase of water to the super saturated steam and the steam is fed to the turbine where the blades of turbine rotate by the contact of high pressurized steam coming from the boiler thus the blades of the turbine rotates and the shaft attached to it also rotated which id further connected to the generator which helps to convert the mechanical energy to electrical energy which can be stored in batteries or to transfer from one to other place.

For these processes we made an attachment of outlet of turbine to the inlet of boiler to increase the efficiency of turbine and to reduce the time taken to convert water to super saturated steam for the process of electricity generation due to this process the work will be decreased for condenser as well as cooling tower due to this we can go with natural cooling tower instead of forced type of cooling process.

2. Working process of power plant before attachment

As we all know that the process starts with burning of coal in the furnace to the storage of electricity. Beginning with the process of furnace the coal is added to heat the boiler as the boiler needs water to change its phase from water to saturated steam as thus the steam is passed to the boiler and then the blades of boiler start rotating to the thrust produced by the steam entering the turbine.

Then the steams reduce its temperature and pressure as at the outlet then the outlet is connected to the system of condenser where the steam is gets cooled and changes its phase from steam to water then in order to get the water to the normal temperature the process of cooling is carried by cooling tower which was the end of the process



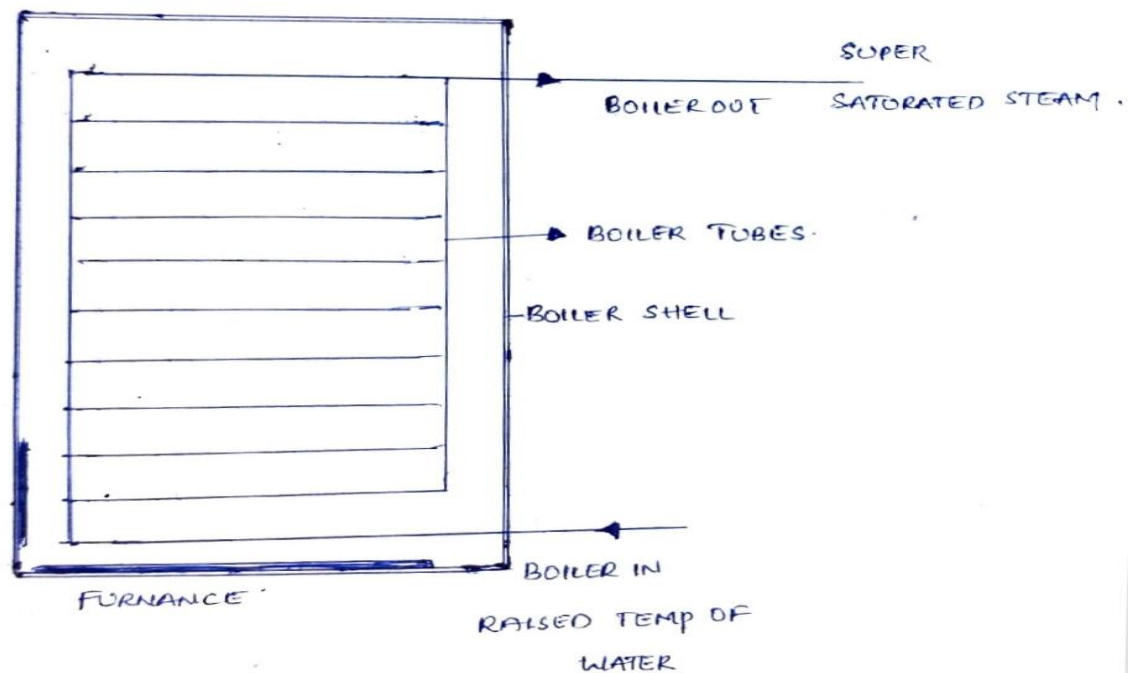
1. Shows the attachment of pre heating system using steam out of boiler

3. Working of power plant after attachment

The process of heating could be the same for both the processes before and after attachment. In the above figure it describes the attachment and modifications carried in the plant layout for the increase of efficiency as well as rate of production carried by the power plant.

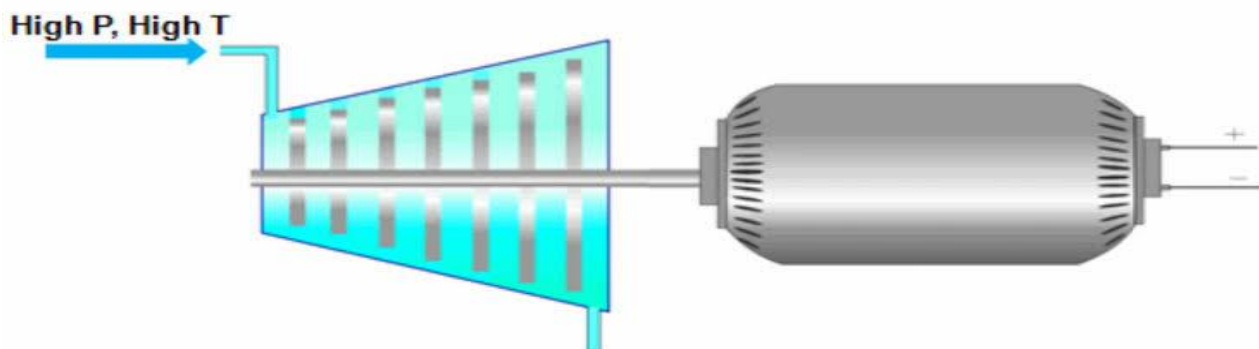
In the above process the steam coming out from the turbine is directly attached to the pipe of water intake system to the boiler after the Strainer so that the water have a contact with the

steam which carries convection process to transfer heat from the hot steam to the intake water at atmospheric temperature due to this rise of temperature the water was at appoint of heat were it changes its temperature so quick to the steam thus we can reduce the time taking for the boiler to convert the water into steam.



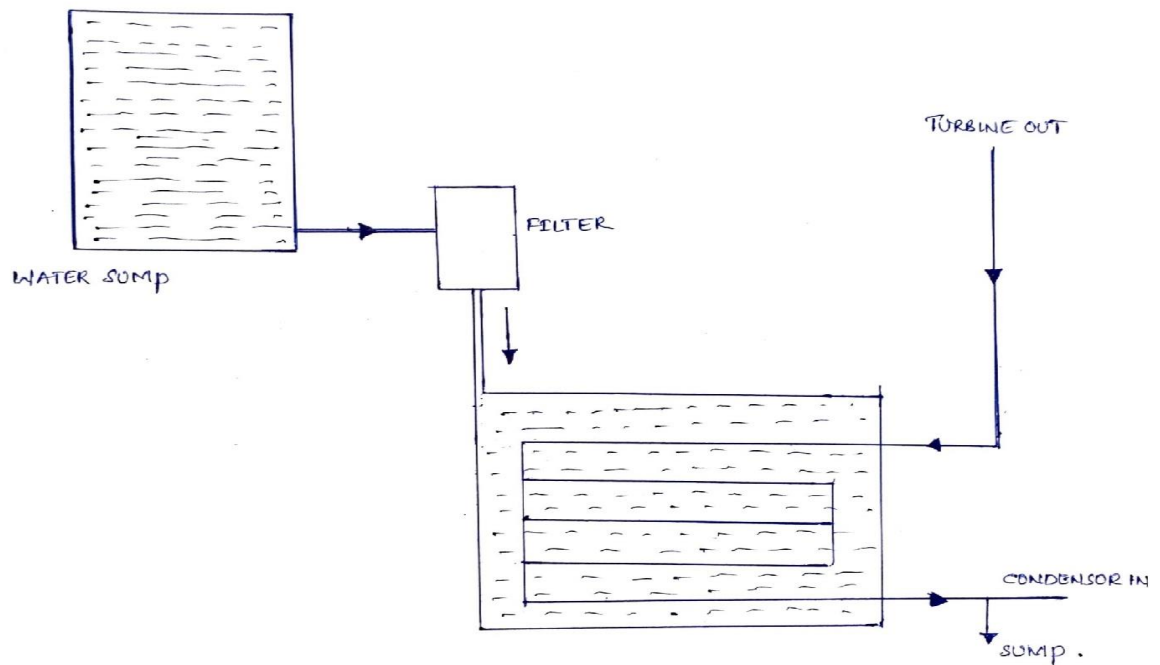
2.

Working of boiler



3. Inlet and outlet of turbine

The above figure shows the exit of turbine steam is extended to the in of pipe consist of water flowing to the boiler with the help of feed pump.



The process of attaching the steam pipe to the water to raise the temperature is defined graphically in the above diagram.

As the process is carried from the end of the turbine is not connected to the condenser and it was extended to the water intake pipe by the method of convection process, we can transfer the wastage heat to the water intake to increase the efficiency of boiler. This helps to increase the rate of production.

And thus, then as we can add the waste heat to the water and we can reduce the load work carried by the condenser due to this the cost carried for production going to be less because handling of waste heat was utilized by the water intake system.

RESULT AND CONCLUSION:

Thermal power plant resembles like generating the rate of electricity to fill the regular needs of the humankind in the society hence we made this major aspect as more confident by converting the wastage of heat regulated by condenser and cooling tower was utilized for the pre heating of water intake to the boiler thus this helps the system to generate electricity at lower rate rather compared to the process before attachment.