UNIT-IV STEAM CONDENSER

1.A steam condenser is a device used for condensation of steam at constant pressure, generally below atmospheric pressure.

2.It is a closed vessel maintained at vacuum.

3.Cold fluid is circulated to remove heat from steam and cause condensation.

Advantages of Condenser

- Reduces turbine exhaust pressure and increases specific work output.
- Supplies pure feed water to the boiler.
- Removes air and non-condensable dissolved gases from feed water.
- Reuses condensate as feed water and reduces cost of power generation.

Need for Condenser

- Steam from turbine exhaust is wet and at low pressure.
- Condenser creates vacuum at the turbine outlet.
- Vacuum improves turbine performance.
- Condensate can be reused as boiler feed water.

Main Types of Condensers

- Direct contact condensers.
- Surface condensers.
- In direct contact condensers, steam and cooling water mix directly.
- In surface condensers, they remain separate and heat transfers through tube walls.

Spray Condenser

- Cooling water is sprayed into the steam.
- Steam mixes directly with cold water and gets condensed.
- Exhaust steam mixes with cooling water to produce saturated water.
- **Barometric Condenser**
- Cooling water falls through baffles to expose a large surface area.
- Steam from below comes in direct contact with the water.
- Steam condenses and the mixture falls through a tail pipe to the hot well below.

Surface Condenser

- Most common type of condenser.
- Steam and cooling water do not come in contact with each other.
- Heat transfer occurs through the tube walls.
- Preferred where impure cooling water is available and condensate must be reused.

Working of Surface Condenser

- Cooling water flows through pipes or tubes.
- Steam surrounds the tubes.
- Heat is transferred from steam to cooling water.
- Condensed water is collected for reuse.
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Single-Pass Surface Condenser

- Cooling water crosses the condenser once.
- Simple arrangement.
- Insert Figure 6.5 here.
- Used in many practical applications