

Distinguish, differentiate, compare and explain what is the difference between impulse and reaction turbine. Comparison and Differences.

De Laval Turbine (Impulse turbine)

In this type of turbine the steam is initially expanded in a nozzle. The high velocity jet of steam coming out of the nozzle is made to glide over a curved vane called blade. Pressure velocity changes in impulse turbine.

Parson's turbine (Reaction turbine)

In this type of turbine the high pressure steam does not initially expand in the nozzle as in the case of impulse turbine, but instead directly passes onto the moving blades. The blades are designed in such a way that the steam flowing between the blades will be subjected to the nozzle effect. The increase in velocity of the steam flowing over the blades develops a force. Pressure & velocity changes in reaction turbine.

The actual reaction turbine consists of a number of rows of moving blades fitted on the different rotors keyed to the turbine shaft with alternate rings of fixed blades rigidly fixed to the casing of the turbine. Both fixed and moving blades are designed in the shape of the nozzles. Therefore the expansion of the steam takes place both in fixed and moving blades.

Comparison and Difference between Impulse and Reaction Turbine

1. Impulse turbine works on the principle of impulse while Reaction turbine works on the principle of reaction i.e. backward force developed opposite to a certain action.
2. In impulse, the energy available at the inlet is only kinetic energy and the pressure is atmospheric. In reaction, the energy available at the inlet is both kinetic energy and pressure energy.
3. In an impulse, water flows along the tangent of the runner. Thus it is called tangential flow. In reaction, water flows in the radial direction through the runner. Thus it is called radial flow.
4. The impulse turbine is used for high heads ranging from 150 to 2000 m. The total head of the reaction turbine ranges from about 30 to 500 m.
5. It is possible to regulate the flow without loss in impulse turbine where as in reaction, it is not possible to regulate the flow without loss.