**ENERGY ANALYSIS OF CYCLES**

A thermodynamic cycle is a sequence of processes that begins and ends at the same state.

Cycles that are repeated periodically play prominent roles in many areas of application e.g. steam circulating through an electrical power

The energy balance for any system undergoing a thermodynamic cycle takes the form

Since the system is returned to its initial state after the cycle, there is no net charge in its energy. Therefore

This conversation of energy principle must be satisfied for every thermodynamic cycle.

**POWER CYCLES**

A power cycle delivers a net work transfer of energy to their surroundings during each cycle.

The net work output from a power cycle can be expressed mathematically as:

Heat transfer of energy into the system from a hot body must be greater than the heat transfer out of the system to the cold body for a power cycle.

The energy supplied by heat transfer to a system undergoing a power cycle is normally derived from the combustion of fuel, a moderated nuclear reaction or solar radiation.

**REFRIGERATION AND HEAT PUMP CYCLES**

For cycles of this type is transferred from a cold system into the system while is discharged from the system into a hot body.

This requires a net work input and all quantities are related by the energy balance which for refrigeration and heat pump cycles takes the form

The objective of a **refrigeration cycle** is to cool a refrigerated space or to maintain the temperature within a dwelling or other building below that of the surrounding.

Coefficient of performance is used to measure the performance of a refrigeration cycle.

The objective of a **heat pump cycle** is to maintain the temperature within a dwelling or other building above that of the surrounding.

THERMAL EFFICIENCY