

## ENE 327 – Pumps and Compressors

### WEEK 6: PERFORMANCE CHARACTERISTICS

#### PERFORMANCE CHARACTERISTICS

In a pump, the output at a given speed is the volumetric flow rate of the fluid and head delivered to the fluid. Then, the fundamental characteristics of a pump are a plot of the head against the volumetric flow rate at a constant speed.

However, this performance can be only achieved by a power input, which involves efficiency due to energy transfer.

The mechanical quantities associated with the machine are:

- a) the size of the machine,  $D$
- b) rotational speed,  $N$
- c) power,  $P$
- d) efficiency,  $\eta$

The pump performance can be only achieved by a power input, which involves efficiency due to the energy transfer.

For this reason, it is also useful to plot the power,  $P$  and efficiency,  $\eta$  against the volumetric flow rate,  $Q$ .

A typical set of performance characteristics for a pump is shown in Figure 1.

For a turbine, the output is the power developed at a constant head for a given speed.

For this reason, the fundamental characteristic is a plot of the power against the speed at a constant head.

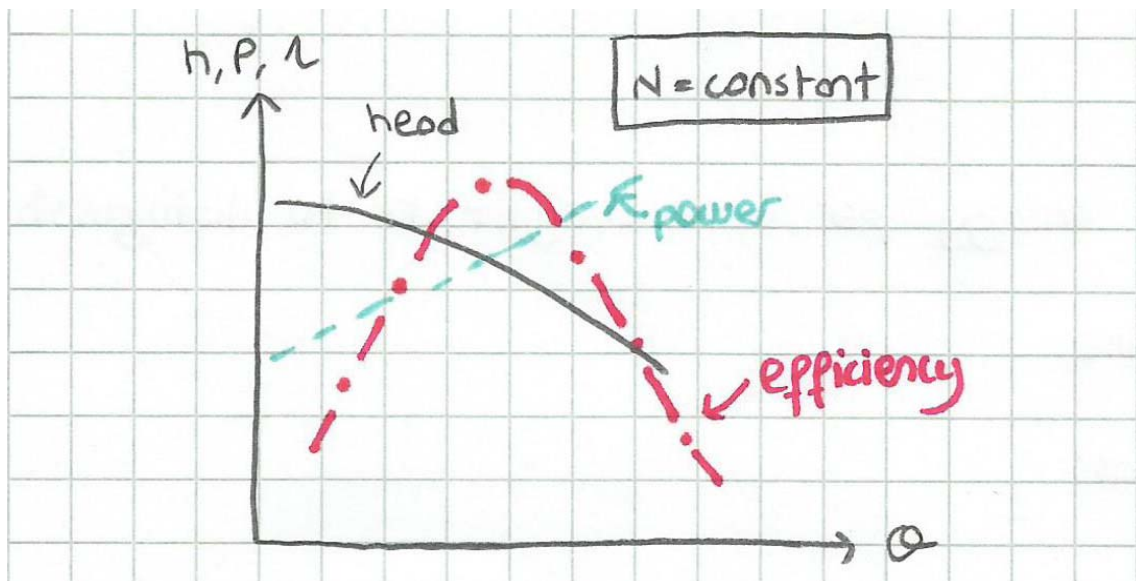


Figure 1: A typical set of characteristics of a pump

In this case, the volumetric flow rate of the fluid is the input. Hence, to complete the set of characteristics the volumetric flow rate and the efficiency are plotted against the speed.

A typical set of performance characteristics for a turbine is shown in Figure 2.

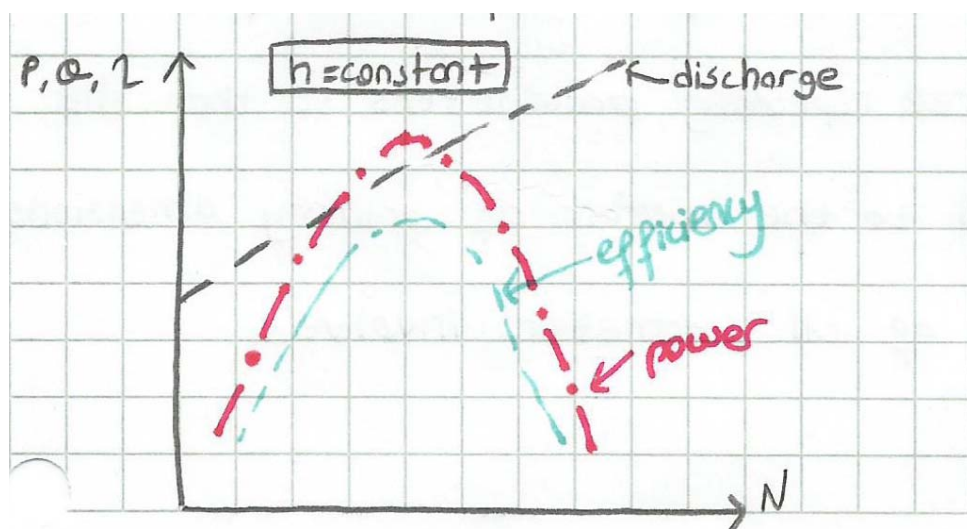


Figure 2: A typical set of characteristics of a turbine

## REFERENCES

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