# FLUIDS LABORATORY
## College of Engineering

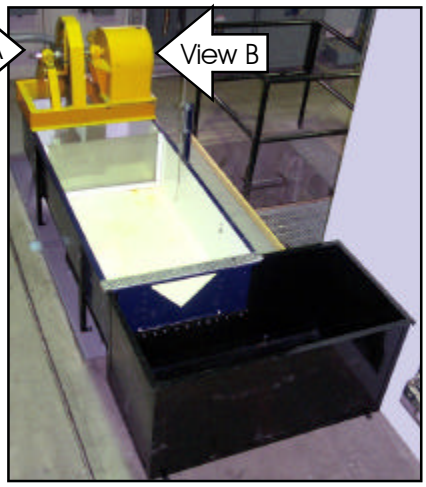
# Pelton Turbine

***Purpose:*** To determine energy conversion efficiency in a Pelton Turbine

***Test Design***

Energy is extracted from the turbine using a mechanical torque applied on the shaft of the turbine. The efficiency of the turbine is obtained by measuring the available hydraulic power and the power developed by the turbine.

View A
The Mechanical Torque




View B
The Turbine

***Measurement Systems***

Individual variables

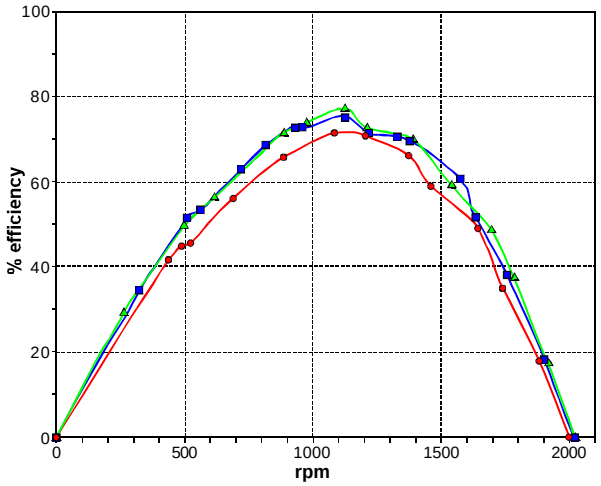
- Available head, *H* - pressure gage
- Discharge through the turbine, Q - triangular weir
- Temperature, *t* - thermometer
- Applied torque, *T* - mechanical brake & calibration pendulum
- Rotational speed, *n* - tachometer

Data reduction equation for the result: $\eta = \frac{2\pi nT}{\gamma QH}$

***Data Analysis***

- Determine the pressure head and discharge on the turbine
- Determine the torqueapplied on the shaft
- Calculate the efficiency of the turbine

***Results***




Results for three tests conducted at free-rotational speed of 2000 rpm. Under ideal conditions the maximum efficiency of the turbine isabout 85%