

ABSTRACT

Microhydro Power Plant (PLTMH) is a small-scale power plant, especially in terms of the amount of electricity produced, hydropower plants below 200 KW are classified as micro-hydro. In the previous study, namely the manufacture of micro hydro power plants using Pelton turbines with 16 blades on the runner at a water discharge variation of 3.61 (l/s), the turbine efficiency was 4.69%. In previous studies, there were many factors that influenced the research, it was difficult to find land with rivers, it was difficult to get a stable water discharge due to the change of seasons which also resulted in the small efficiency obtained.

Based on this, a water pump speed control with the PID method has been designed in a Pelton Portable Microhydro Power Plant. Rotational energy in the turbine is obtained from the push of the water pump as a substitute for water pressure using the flow rate and water level. Using the PID method to get a constant water rate.

In this final project, Water Pump Speed Control has been designed using the PID method using the Arduino Uno microcontroller. This system is designed by using a voltage sensor that is connected to the battery while charging is running. The sensor will send the voltage value that is read into the microcontroller and will be processed by the microcontroller using the PID method to regulate the speed of the water pump so that the turbine can produce a stable voltage of 13V and a current load of 5 amperes when charging a 12V battery, based on the system, the charging value is obtained at $SP = 13V$ with $K_p=80$, $K_i=80$, and $K_d=4$, which resulted in $Overshoot=0$, $Resschime=100ms$, $Setlingtime=0$, and $Error\ steady\ state=1.5V$. The turbine efficiency obtained is 6.24%.

Keywords : *Micro Hydro Power Plant, PID, Portable, Peltone Turbine*