

ABSTRACT

Picohydro power plant generator is renewable power plan with power output below five kilowatts. This power plant is applied at mountainous area with a small stream as energy sourcing. However, in the implementation still found technical problems so that needed a special review in design of PLTPH tester as a solution of that problem. Therefore that is required a testing system to found variables that associated with cause of the problem.

In this final project, a PLTPH efficiency testing system is designed with closed channel flow system for laboratory scale measurement. The variables that tested in this project are water flow rate, pressure, voltage, and electric current. Form these data then obtained static characteristics, dynamic characteristics, and efficiency of PLTPH tested. Form the research result obtained static characteristics are the average of input pressure is 6649 Pa with standard deviation 135, the average of input water flow rate is $9,27 \times 10^{-4} \text{ m}^3/\text{s}$ with a standard deviation of $1,36 \times 10^{-5}$, the average of output voltage is 1.21 V with a standard deviation of 0.04, the average of output current is 0.053 A with a standard deviation of 0.006. The dynamic characteristic is that the response time of the output voltage reaches steady is 78 seconds, while the response time of the output current reaches steady is 64seconds. The efficiency of PLTPH tested is 0,76 %.

Keyword: PLTPH efficiency testing system, laboratory scale measurement, static characteristics, dynamic characteristics, efficiency.