

Nozzle Diameter Variation on Performance in the Design of Build Pelton Turbine

Ir. M. Joko Wibowo, M.T *as cheif counselor* and Ahmad Fahriannur, ST., MT *as a member counselor*

Roni Hidayatullah
Study Program of Renewable Energy Engineering
Majoring of Engineering

ABSTRACT

Efforts to meet electricity needs have been developed both in terms of technology or optimizing the potential of new energy to produce electricity. The development of PLTPH is a solution to produce electricity in areas that have not yet been reached by electricity. This study aims to one of the efforts to meet the electricity needs by making a Pelton turbine and to determine the effect of the nozzle diameter parameters on the resulting performance. This research was conducted on August 4, 2019, at the Tajek Village in Pakis Village, Panti Subdistrict, Jember Regency by utilizing the irrigation flow. The research method used is an experimental method by making turbines. The results of making the turbine are then tested to determine the resulting performance. The results showed the influence of the diameter on the performance of the turbine produced, the greater the diameter of the nozzle used, the turbine rotation, voltage, frequency, torque, and turbine power decreases with the addition of load power on the generator. The best results of making the nozzle are 2.7 cm in diameter with the test results of 141 V voltage, turbine rotation 219.25 rpm, current 0.21 A, frequency 48.75 Hz, torque 4.55 Nm, and turbine power 104.4 watts using lamp loads TL 120 watts. The performance of the turbine produced by the turbine has an efficiency of 42% of the potential power generated by 379 watts.

Keywords: *energy requirements, pelton turbine, nozzle, performance*