

Rancang Bangun Penyimpan Energi Listrik Skala Kecil Berbasis Hidromekanika Menggunakan Turbin Cross Flow (*Design of Small-Scale Electrical Energy Storage Based on Hydro-Mechanics Principal Using Cross Flow Turbine*)

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ABSTRACT

Design of small-scale electrical energy storage based on hydro-mechanics principal using cross flow turbine is a study to design and build electrical energy storage systems, also to determine the efficiency of system and a diagram of the energy flow in this system. The method of design begins with the identification of the problem, literature review, design, construct and evaluation. The design of energy storage that is used in this study is consist of the upper reservoir, lower reservoir, penstock, suction pipe, centrifugal pump, cross flow turbine, transmission systems and generator. This was descriptive research with observation parameters consist of testing the function of components, electrical energy charging and discharging electrical energy. The results of the design based on the consideration and selection of produce design height difference of 2.5 m, the reservoir volume 1000 liters, 220 Volt AC generator at an angular speed of 1200 rpm. From the test results it shows that the total charging energy is 103.903 Wh for 23 minutes. The total energy of discharge is 2,270 Wh for 13 minutes. Losses energy systems is equal to 101.633 Wh. So the design of electrical energy storage based on hydro-mechanics produced total system efficiency of 2.18%.

Keywords: *Hydro-Mechanics, Energy Storage, Electricity*