

Design and Build A Semi Cylinder Savonius Water Turbine In The Flow In Pipe-line

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ABSTRACT

Utilization of irrigation pipe flow in rice fields as a small-scale hydroelectric power plant can be used as an early effort to reduce dependence on electrical energy by PLN. The main role in the construction of a hydroelectric power plant is a turbine, a turbine that is right for operation at the flow in pipe-line is needed to produce the maximum power coefficient and ease of construction. The study used a Semi Cylinder savonius turbine to be applied to the flow in pipe-line with the addition of a deflector or without deflector. The test results and calculations show that the savonius Semi Cylinder turbine has the best performance with an efficiency of 11% in the no-load generator test with the addition of a deflector. The best electrical efficiency is 7.54% in the same test. The greatest mechanical power and electrical power in the semi-cylinder savonius turbine are 43.735 Watt and 0.325 Watt, respectively. It is known that the use of a deflector in a semi-cylinder savonius water turbine in the flow in the pipe has an effect on increasing the speed of water flow just before it hits the turbine rotor, causing an increase in the turbine rotor rotation by an average of 32,069 %, an average mechanical power increase of 53,320 %, and an increase in generator power of 58,272 %.

Keywords : Turbine Savonius, Semi Cylinder, Pipe, Deflektor