Simulation Study on Cross Flow Turbine Performance with an Angle of 20 Â° to the Variation of the Number of Blades

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Abstract	Water turbine is one of the important components in the development of renewable energy in Indonesia. Indonesia has the potential of 94 GW to be sourced from hydro energy. The development of the water turbine will positively impact the development of renewable energy in Indonesia. On the other side would help achieve the government's target on the composition of new renewable energy was increased to 23% - 31% in 2050. This study has used a water turbine type of cross -flow and simulation using the ANSYS CFX Solver Application. The purpose of the research that has been carried out is to determine the best number of blades in the cross -flow turbine to produce maximum performance in the water turbine. The runner design used has 80 mm in diameter, 130 mm in length, and 20 degrees blade angle. Variations in the number of blades were carried out on blades 32, 36, 40, 44, and 48. This simulation has been carried out under steadystate conditions and the turbulent Shear Stress Transport type. The cross -flow turbine operates at a water velocity of 3m / s. The results show that the Coefficient of Power Maximum generated for blades 32, 36, 40, 44, and 48 is 20%, 21.85%, 18.96%, and 13.47%. These results show that the cross -flow type hydro -turbine generates the maximum performance with a runner with a number of blades 40.
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