Nozzle’s guide vane of the cross-flow turbine has been created based on the design of the JLA with a laboratory scale with two alternative types of Airfoil FX-69-PR-821 and Kennedy and Marsden. These all kind of guide vane was tested on a mini-plant that have been made to quantify the value of static and total pressure, torque and rpm with the different variation of angle of attack, the test was also performed using the Fluent CFD software. The result is a kind of Airfoil affect on pressure and efficiency of the turbine. Simulation results of the pressure rise both static and total pressure on the input and output. From the contours simulation results obtained that the largest flow velocity occurs in the guide vane type FX-69-PR-82 at an angle of attack $27^\circ$. Meanwhile, the smallest velocity occurs at JLA Vane guide with angle of attack $27^\circ$. Greatest efficiency of experimental results is 21.79%, occurred in the use of guide vane type Kennedy and Marsden airfoil on the angle of $14^\circ$. The smallest efficiency is 10.9%, occurred in the guide vane type FX-89-PR-821 at angle of attack $14^\circ$. For the results using torque data from simulation the greatest efficiency is 16.83%, occurred when using FX-69-PR-821 airfoil as a guide vane with angle of attack $27^\circ$, while the lowest efficiency 6.23% occurred when using FX-69-PR-821 airfoil as a guide vane at angle of attack $14^\circ$.

Keywords: nozzle, guide vane, cross-flow turbine, guide vane JLA, FX-69-PR-821 airfoil, Kennedy and Marsden airfoil, Fluent.