

ABSTRACT

The energy continuous in indonesia is increasing. The fossil energy as an energy source is highly limited. it will run out in the future. The development of eco-friendly alternative energy is one of the best ways to reduce the fossil energy. It can guarantee the energy availability supply continuously in Indonesia. Waste Heat is one of alternative energy which has not been widely used optimally. By using thermoacoustic engine, the energy of waste heat can be used to trigger bi-directional turbine. This research was aimed to plan and make bi-directional wells turbine airfoil NACA 0024 which has the most optimal amount of blade and diameter.

Thermoacoustic engine can generate energy wave from waste heat conversion into acoustic power. It happened because there was a temperature gradient difference between Hot Heat Exchanger (HHX) and Cold Heat Exchanger (CHX) through wire mesh. The wave generated could trigger bi-directional wells turbine.

The bi-directional wells turbine test result by using airfoil NACA 0024 with blade amount and diameter variation showed that the highest rotation belonged to the six blades turbin and 0,5 in diameter the 15 cm distance and the 1700 rpm speed. This test was carried out by using 2 inch resonator with the 20.9474 kW/m² acoustic intensity and 45.3114 watt acoustic power.

Keyword : Thermoacoustic, Bi-Directional Turbine, Wells Turbine