CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

Misbah M. Syed

Project Number

J0221

Project Title

Efficient Design of Oscillating Water Column to Maximize Power Generated from Ocean Waves

Abstract

Objectives/Goals

The objective of my project is to find the effect of change in diameter on the amount of power generated by an oscillating water column.

Methods/Materials

My project method is to use a digital multi meter to measure the voltage and the current readings for the different oscillating water column designs to determine the peak power output. The materials I used were 2in., 3in., 4in. diameter ABS pipes, ABS cap hubs, rubber packing, 80mm computer cooling fan, digital multi meter, electrical color tapes with varying colors, and alligator clip cables.

Results

The 4-inch diameter oscillating water column produced more power than the 3-inch diameter oscillating water column. The modified 4-inch diameter oscillating water column (which has a short length of 2-inch diameter on the top closer to the fan) was the most efficient.

Conclusions/Discussion

The conclusion I reached was that diameter plays an important role in the efficiency of an oscillating water column. The modified 4-inch diameter oscillating water column produced the most energy because the waves force the air from 4-inch diameter pipe into a narrower 2-inch diameter space and the pressurized air exits through the fan causing it to spin faster thereby generating more power.

Summary Statement

I found that the diameter and design of the oscillating water column plays a critical role in the amount of power generated.

Help Received

I conceptualized and designed the oscillating water column models by myself. I took some assistance from my parents in building the model and while conducting the experiments