The goal of Team Constant Contact is to design and construct the most efficient vertical-axis turbine for renewable energy in marine applications. During the initial testing phase, multiple turbine types will be tested to determine the most efficient configuration for our application. During the second phase, our team will fabricate a buoy configuration using the chosen turbine and deploy it for field testing. The entire project will be completed within the $1200 budget provided by Florida Tech.

Our Team

Joshua Lappen  OCE  jlappen@fit.edu
Travis Schramek  OCE  tschrame@fit.edu
Michael Smit  OCE  msmit@fit.edu

Advisor:

Dr. Stephen Wood  OCE  swood@fit.edu

Florida Institute of Technology
Department of Marine & Environmental Systems
150 W. University Blvd.
Melbourne, FL 32901
Phone: (321) 674-8096

Ocean Engineering
Senior Design 2009-2010
Abstract:

The goal of Team Constant Contact is to design and build a vertical-axis current generator. This project will test new, revolutionary turbine configurations. It will also create a test bed for an accurate comparison between different configurations of turbine blades. This project will be completed in two stages: Initial Testing, and field testing.

Phase I: Three vertical-axis turbine configurations will be tested: The Darieus Turbine, the Gorlov Helical Turbine, and the Servonious Turbine. Comparison of these blades will be based on RPMs, overall electricity production, as well as cost and difficulty of manufacturing. To perform controlled testing of the turbines, the structure will be mounted forward of a pontoon boat.

Phase II: The blade housing will be converted into a buoy system. Adequate floatation will be added along with an anchoring system. The structure will be oriented so the blade’s axis will be perpendicular to the water’s surface. This set up will be field tested in an area with optimal current speed for the blade chosen.

This project can be directly applied to modern societies thirst for cleaner power. The ocean offers vast opportunities for generating renewable electricity. This project will not only provide a finished product, but will create a structure for future testing and comparison of blade design.

Turbines To Be Tested:

Darieus Turbine
The Darieus turbine is a lift type turbine consisting of multiple airfoils. This type of turbine is currently used in many wind applications. Fluid flow around the air foils results in lift, spinning the turbine.

Gorlov Helical Turbine
The Gorlov Helical turbine is a revolutionary design that optimizes the angle of attack of a Darieus type turbine. Studies indicate that this turbine is currently the most efficient low head turbine in the world.

Servonious Turbine
The Servonious Turbine is a drag-type turbine. It is one of the oldest styles turbines in use.