



NIWC Hydrokinetic Turbine

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Team Low Flow

Project Statement

NIWC needs a system of original design that can provide power in parallel with their microbial fuel cell.

Specifications

- 3'x3'x3' envelope
- Capable of power generation at a water flow speed of 0.3 m/s
- Operational depth of 15m with a Factor of Safety of 2.00 on all components

Voltage & Current Output

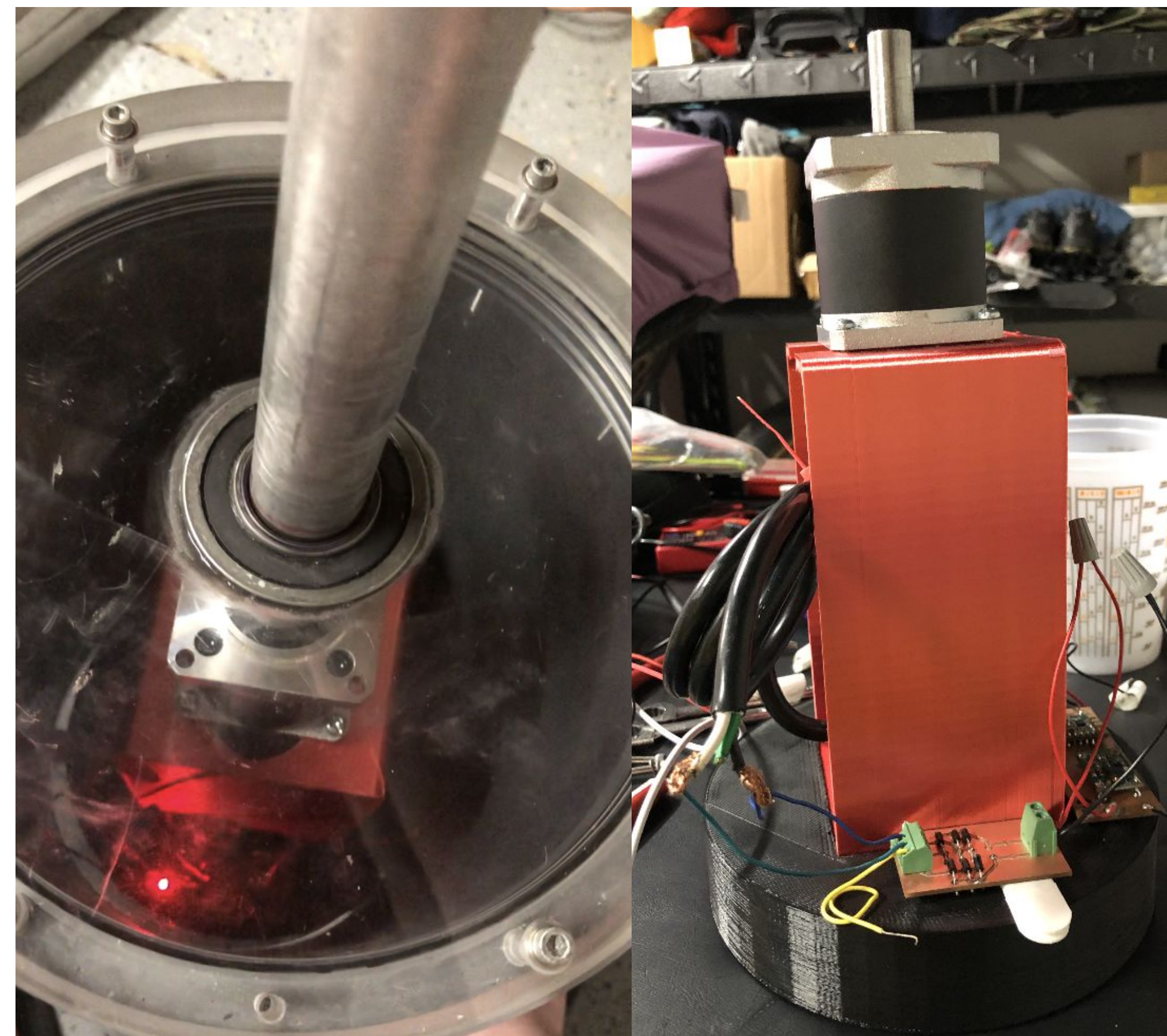
- 2.5 rpm gives a 1V output
- 5 rpm gives a 3V output
- 0.04 Amp average at 2.5 rpm

Waterproofing

The turbine was sealed with a layer of epoxy resin and sprayed with TotalBoat anti-fouling spray. The Prevco itself is waterproof and the shaft is sealed with a waterproof bearing with shaft/bearing and bearing/prevco connections filled with JB-weld and caulking.

Design Description

Savonius C-Foils in the interior with Helical Darrieus blades on the exterior. The Savonius foil's purpose is to catch the slow flow to start the spin and provide start-up torque. The Darrieus foils sustain a constant rotation and take over at high flow speeds. The rotational motion is transferred into the shaft that extends into the Prevco housing where it is increased by 15x before being used to operate a brushless DC generator.



Final Design



Acknowledgements

We would like to thank Dr. Alexander Lehman for his instruction and insight. We also thank Mike Lester for guidance within the machine shop. Lastly, we would like to thank Alex and Bashar from NIWC for allowing us to work on this project, and for their continued support throughout it.