The Effects of Different Turbine Blade Shapes on the Output of Hydroelectric Power

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The future of hydro energy is here! You may have heard of government dams generating energy, but not many regular citizens have the money or means to build their own functioning hydroelectric dam. I am striving to give those people an affordable option. The purpose of this research is to determine the best blade shape to generate the most energy in milliamps. The method to completing the experiment was by 3D printing an original blade design and purchasing two more traditional blades. They were then connected to a generator and submerged underwater in a self-designed underwater turbine simulator. A strong current was simulated using a pond pump. A multimeter was used to measure the mA generated for each blade over 12 trials (36 total raw data points). There were two variables and one control. The results of the research showed that the red turbine had the highest average recorded milliamps at 11.475mA, while the yellow turbine (the control) had the lowest average recorded milliamps at 0.233mA. The blue turbine had an average recorded output of 1.580mA. The red turbine's average mA output was 581% higher than the blue turbine's average mA output and 2,440% higher than the yellow turbine. In conclusion, the red turbine did the best, as it had a large surface area of each blade and the blades were slightly curved in a scooped angle to catch more water. The yellow turbine might have been the most consistent by having the smallest range (0.4mA), but the yellow turbine was very low producing. On the other hand, the red turbine had the same range as the blue turbine (1.4mA). It is important to point out that the red turbine did almost 6 (581%) times better than the blue turbine in terms of mA readings.

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