How Does Flow Rate Affect Hydropower?

Worley, Craig

The purpose of this test was to see if the flow rate of a hydropower plant would change the electrical output. This is significant because, it could result in more power being produced from the hydropower plants, and hence it would lessen our dependence on fossil fuels. In my hypothesis, I thought that the four-liter per minute flow rate would produce the most amount of energy, as it would be the apex of the predicted square root function I expect the date to follow. To test my hypothesis, I built a stand that allowed me to test this theory. I then created three caps with different holes that allowed me to change the flow rate from 2 to 4 to 8 liters per minute. I ran each independent variable 30 times to get a good statistical average. The two liters per minute produced about 28.719 watts and followed (y=-6.2912x+4.4379) which had an “R value of 0.93906. The four liters per minute produced about 34.012 watts and followed (y=58.824x2-57.031x+13.404) which had an “R-value of 0.97612”. The eight liters per minute produced about 17.768 watts and followed (y=66.658x2-55.515x+10.496) which had an “R value of 0.79563. My hypothesis was accepted for being the most efficient. The P-value and one-way ANOVA proved that my results were statistically different proving that the four-liter per minute test was best. If we were to implement this system we could be able to produce more energy and hence lower our dependence on fossil fuels.

Awards Won: