Water Siphoning as an Alternative Hydroelectric Renewable Energy Source

Gilles, John

The engineering goals of this project involved utilizing water siphon technology in order to improve modern hydropower designs by engineering and innovating a more efficient, economical, and environmentally friendly renewable energy solution. A model was constructed to portray how water can be siphoned by many tubes from a high elevation of water in a river to a lower elevation in the same river without ever impeding water flow like hydroelectric dams. This elevation drop, found at existing dam sites or natural waterfall locations, allows descending water to spin turbines and produce energy. In order to engineer the most efficient form of energy production and also take into account varying geographical locations, two tests, which studied the effects of water temperature and siphon tube outlet height on voltage output of the model, were conducted. The tests determined that more electricity was generated with increased water temperatures and greater siphon outlet heights. A 42.2 ? water temperature averaged a voltage output of 2.4 millivolts while a 1.7 ? water temperature only averaged 1.8 millivolts. The 30 cm siphon outlet height had a mean voltage output of 3.2 millivolts while a 3 cm height had an average voltage output of 2.3 millivolts. ANOVA statistical tests were conducted to support both claims. Electricity output calculations were also computed comparing the proposed siphon technique of energy creation to that of a hydroelectric dam. Future plans include constructing a large scale model to calculate exact energy outputs and implementation costs.

Awards Won: