Zotlöterer Gravitational Vortex Power Plant

In a fairly radical departure from the principles that normally govern hydroelectric power generation, Austrian engineer Franz Zotlöterer has constructed a low-head power plant that makes use of the kinetic energy inherent in an artificially induced vortex.

Zotlöterer was looking for an efficient way to aerate the water of a small stream when he hit upon this idea of a plant that not only gives air to the medium but also takes from it some of the kinetic energy that is always inherent in a stream.

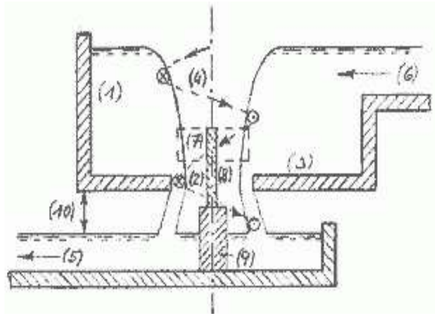
Austrian engineer, Franz Zotlöterer, has constructed a low-head power plant that makes use of the kinetic energy inherent in an artificially induced vortex. The plant can be installed with a water drop as little as 0.7 meters.

In Zotlöterer's system, the water's vortex energy is collected by a slow-moving, large-surface water wheel, making the power station transparent to fish. There are no large pressure differences built up, as happens in normal turbines. The cost of construction for such a plant is half that of a conventional hydroelectric installation of similar yield; and the environmental impact is positive, instead of negative.

How it Works

The aspect of the power plant reminds a bit of an upside-down snail. The water passes through a large, straight inlet, and then passes tangentially into a round basin, forming a powerful vortex (whirlpool), which finds its outlet at the center bottom of the shallow basin.

The turbine does not work on pressure differential but on the dynamic force of the vortex. Not only does this power plant produce a useful output of electricity, it also aerates the water in a gentle way.



Of course the use of water vortices has been pioneered by another Austrian - Viktor Schauberger, who was also known as the "water wizard". He floated hard-to transport heavy logs from remote regions of the Austrian forests, not accessible at the time by streets, to where they would be milled and processed. The feat was accomplished by carefully regulating the water's temperature and by inducing a rolling, longitudinal vortex motion in the water.

The aim of the invention is to create a hydroelectric power plant that is better and less expensive than previous embodiments. Said aim is achieved by a hydroelectric power plant which supports the formation of a stable gravitational vortex which tends to be formed also in the upper reaches directly in front of the turbine inlet of conventional river stations as a lost vortex and is therefore prevented as much as possible there. The inventive hydroelectric plant, however, ensures that the necessary current-related conditions are fulfilled for reinforcing the rotational movement of the water, which is created when the water flows off, in an unimpeded manner into a stable gravitational vortex without using pressure lines and directing devices. A turbine that rotates in a coaxial manner within the gravitational vortex and is impinged upon along the entire circumference thereof withdraws rotational energy from the gravitational vortex, which is converted into electric power in a generator

In addition, the inventive hydroelectric power plant allows the body of water that is used for generating power to be aerated so as to enhance the self-cleaning properties thereof and the water temperature to be reduced during the summer while decreasing the tendency thereof to be covered with ice during the winter and improving the water quality by activating the water.

Zotlöterer describes the many advantages of the gravitational vortex turbine power plant:

• At the discharge of the vortex, contaminants are evenly distributed through the water, which is also oxygenated, leading to improved efficiency of natural micro-organisms to decompose the contaminates: hence, cleaner water downstream.

• The increased contact area between the water and air results in better cooling evaporation during the warm season, and a perimeter of ice insulates the water in the cold season--all the while the turbine continues gently turning out the Watts.

• The temperature self-regulation capacity of the water is further enhanced by the concentration of the densest water at the middle of the vortex. Since water is densest at 4°C, water which is warmer than 4°C tends to be cooled when it is pulled into the vortex and cooler water is warmed by the mixing which the vortex causes. Biodiversity downstream is enhanced by the stabler temperatures.

Properties of the gravitation water vortex:

The gravitation water vortex

• increases the water surface area.

• maximizes the velocity of flow on the water surface area.

• disseminates homogeneously contaminants in the water.

"People from all over the world contact us because of our water vortex power plant– a technology which makes our rivers clear again and produce electricity." ~Franz Zotlöterer

• increases the contact surface of the disseminate contaminants for microorganisms and water plants

• aerates the water naturally, because of the high velocity of flow on the water surface area and the increased water surface area, to support the self-purification of water with microorganisms and water plants.

• increases the heat of evaporation and so water can reduce the temperature itself at rising temperatures in the summer.

• builds up a peripheral zone of ice in the winter to isolate the center of the vortex.

• concentrates dense water (water at 4°C) in the ring-shaped centre to ensure the survival of microorganisms as long as possible.

• decelerates the flow of water, so it can be used as an active retention pond.

• concentrate rotation energy in the ring-shaped centre and so it can be used for a water power pl

For more info:

http://www.zotloeterer.com