

O.S. Karpova, I.V. Stepanets
O.N. Moroz, research supervisor
A.I. Borodina, language adviser
PetroVasilenko National Technical University of Agriculture, Kharkiv

Generation of Electricity Using Water Supply Lines

For many decades large hydropower objects - hydroelectric power stations - have been used for the production of electricity in China. But engineers have long been interested in the waters flowing in the water supply lines as a potential source of energy. However, pipes let a much smaller amount of water pass, due to their small diameter. This has a negative impact on power generation.

Recently engineers from the Department of engineering services and water supply (WSD) of the Polytechnic University of Hong Kong (PolyU) have developed and presented a device which will make it possible to receive electricity from the energy of the water flowing in the water pipes.

Hong Kong has a water supply network with the total length of pipes in 7800 kilometers. These pipes must be under constant supervision in order to ensure the integrity and proper functioning of the network. To start the surveillance equipment a new device is used, which is a small turbine, installed directly in a pipe and driven by the flowing water. Its developers claim each so small that turbine is able to generate 80 volts, which is enough to power four fluorescent lamps.

The turbine consists of a small hydropower generator, immersed into water which makes it possible to compensate for the residual water pressure, and a hollow central rotating shaft with eight blades, which minimizes the loss of energy. To increase the amount of generated energy, the engineers placed the device at the outlet of the pipe, where the flow of water accelerating, as a rule. In order to ensure a high quality of drinking water the turbine has no parts which require lubrication.

At the present time the new device is being tested in a number of places throughout Hong Kong. According to the estimates of developers, the turbine established at the water supply network will make it possible to save 700 kilowatts of electricity and reduce carbon dioxide emissions by 560 kilograms every year.