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First screw generator for water industry saves £127,000 a year

A revolutionary renewable energy method based on an Archimedes screw and an ABB motor and variable speed drive is saving Yorkshire Water over £127,000 a year in electricity costs.

The application, designed by Archimedes screw manufacturer Spaans Babcock in conjunction with civil contractor JN Bentley and installed at Esholt treatment works near Bradford, uses two Archimedes screw turbines in series. Each turbine is connected to an ABB 110 kW standard AC induction motor and ABB industrial drive used in a generator mode. The two generators produce a total of 180 kW of power and operate 24 hours a day, every day. The electricity generated from the hydro-turbines is used to reduce the imported power demand of the treatment works, saving £350 a day in imported electricity costs.

Set between the inlet works grit collectors and the new primary settlement tanks, a flow of over 2,600 litres per second is directed through a 1.8 metre diameter pipe to the screw generators. The first installation in the UK to use untreated sewage for hydro power generation, it has now been operating at the site perfectly for over six months.

Screw generators can be used in any situation where water flows from one level to another, such as rivers, industrial effluent plants and within or at the outlet from water treatment plants.

ABB was heavily involved in the development of the application, using its expertise to help Spaans and JN Bentley design the electrical side of the generator. Mark Brown, Sales Director of Spaans Babcock, says: "We chose to work with ABB because of the high level of technical expertise it can offer. They have a great deal of experience in the field of power generation, most notably wind power, which reinforced our confidence in the company."

The application uses an ABB industrial drive that is widely used in the water treatment industry, making it familiar to engineers.

Steve Moore of ABB says: "This is a fantastic application that helps the water industry improve and extend its use of green energy.

"Our role was to provide a matched package of variable speed drive and motor, guarantee the efficiency and provide the best technical advice for the application. We are still working on the Esholt installation, finding the best way to optimise the power output and monitoring the performance data to get the most out of the system."

ABB is working on other similar installations with Spaans and JN Bentley, including a 200 kW version for the Tees Barrage that will aid white water rafting training for the 2012 Olympics.

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pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 147,000 employees. www.abb.com



Caption: A revolutionary renewable energy method based on an Archimedes screw and an ABB motor and variable speed drive is saving Yorkshire Water over £127,000 a year in electricity costs.

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