ABB power survey helps the UK’s leading water company tackle costly reactive-power problems.

Background
Severn Trent Water provides water and waste services to more than eight million people in the UK. This makes it the world’s fourth largest water company. With an annual electricity bill of well over £25 million, the company found that it needed to limit the possibility of reactive power charges from Central Networks which supplies over 90 per cent of its electricity.

Working across the heart of Britain, the company operates over one thousand water and sewage treatment plants in an area of 21,000 square miles which stretches from mid-Wales to Rutland and the mouth of the Severn to the Humber.

Every day, Severn Trent Water supplies over 1,800 million litres of drinking water and treats over 2,500 million litres of waste water and sewage in plants packed with electric equipment such as motors, pumps and air blowers, all placing a major load on the local power distribution network.

When Central Networks, the local DNO, began to impose charges on excess reactive power, the company took steps to measure its power factor (PF) which shows how effectively electrical power is being used.

A distribution system’s operating power is composed of two parts: active (working) power and reactive (non-working) magnetising power. The active power performs the useful work, while the function of the reactive power is to develop the magnetic fields required by inductive devices such as transformers, motors, pumps, fluorescent lighting and computers.

If poor power factor is not corrected, the DNO has to provide the non-working reactive power in addition to the working active power. This can result in larger generators, transformers and other distribution systems.

Reactive power charges
From 2006, Central Networks started to impose excess reactive power charges for customers with a PF less than 0.95. The charge varies, according to the region and the voltage level, from £0.07 to £0.20 per reactive power unit (kVArh).

Severn Trent Water decided to undertake a thorough survey of its key sites to determine their actual PF. The company’s Energy Efficiency Manager, explains: “Power Factor charges could add something like 20 per cent to our electricity bill.”

“We identified a total of 18 sites in immediate need of a PFC survey and chose ABB for the work. The way they carried out the surveys, handled the installation of new PFC equipment and helped us further develop our own understanding of power factor implications has confirmed that we made the right choice.”
At each site, ABB carried out a detailed power factor survey, typically lasting three days and covering around 20 transformers. Where possible, Severn Trent Water’s own metering equipment was used. In some cases the nature of some processes meant that ABB engineers had to undertake ‘live work’.

Of the 18 sites surveyed, four required immediate action, while a further nine were identified as needing to be kept under observation.

Severn Trent’s Energy Efficiency Manager says: “The way that ABB shared information with us and suggested ways to improve the equipment we already had, rather than wanting to carry out unnecessary work to install new PFC equipment, gave us complete confidence that we were targeting the major investment at areas where it would have the maximum effect.”

“The project has been successful in improving the electrical efficiency at key sites and reducing our exposure to power factor charges. It has also helped to raise the profile of power factor as an important consideration for our day to day operation and ABB is now recognised as a preferred supplier for future projects.”

For more information please contact:
ABB Limited
Power Products
Phone: +44 (0)151 3578400

www.abb.com/uk