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# ABB drives help prevent harmful water hammer at pumping station

ABB variable speed drives are helping reduce the damaging effects of extreme water turbulence in the pipework, so-called water hammer, at a water treatment works in Scotland.

The drives were supplied and installed at the Howden Water Treatment Works near Selkirk, by ABB Drives Alliance member EDC (Scotland) in Renfrewshire. Howden is a new facility for Scottish Water, Borders Office, consisting of a borehole pumping station as well as the treatment works itself.

Consultants Ramsay + Primrose, say: "We have four pumps at the boreholes serving a common contact tank. The ABB drives are particularly useful on the high lift pumps because they allow us to set the rate of filling of the main storage tanks to approximately match demand. This limits the number of stops and starts required and reduces the damaging effects of surging, known as water hammer."

Water hammer occurs when the flow of water in a pipe is stopped suddenly, causing a shock wave to ripple through the water and impact on the structure of the pipes, leading to damage. Over time, this can result in burst pipes, causing possible injury to operators. Using a variable speed drive allows demand to be smoothed out, reducing the sudden stops and starts that lead to water hammer.

Eight ABB ACS 600 drives are used on the two applications – four on the pumping station and four at the treatment works. Two of the drives for the boreholes pump 5 million litres per day, with the other units pumping 6.6 million litres and 10 million litres per day respectively. The treatment works' four drives pump 5 million litres and 10 million litres per day in adjustable combinations. The rated duty of the works is 16 million litres per day.

Ramsay + Primrose add: "We set the filling of the tanks to match the demand, assisting with the regulation of the treatment demand of the system."

The soft start capabilities of the drives are also critical to the application, helping the facility meet the electricity utility's regulations on motor starts. To reduce the current at start-up, these must not exceed 68A at 11,000 volts and each motor must be started separately, with a two second minimum time between starts. Active harmonic filters limit the distortion to the supply at the point of common coupling.

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**Caption:** Variable speed drives from ABB are helping to prevent water hammer at Howden Water Treatment Works in Scotland.

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