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WARRINGTON, UK, MAY 26, 2016

# ABB drives cut energy costs and improve reliability at Susworth Pumping Station

A surface water pumping station expects to cut the energy use of two submersible pumps by between 10 and 15 percent following the installation of ABB variable speed drives (VSDs).

The VSDs also avoid the cost of installing a new transformer and improve the reliability of the site's pumping system.

Susworth Pumping Station, located in Lincolnshire, is managed by the Shire Group of internal drainage boards. The station, which discharges into the River Trent, uses the submersible pumps to transfer surface water runoff from the low lying catchment, protecting people, property, agriculture and the aquatic environment. The pumps are rated at 65 kW and 75 kW, with a combined full load current of 202 A. Both pumps run at 950 rpm.

The pumping station's electrical supply is via a remote pole transformer rated at 100 kVA. Because of the transformer's rating, only one pump could run at a time, even during periods of prolonged rainfall.

The solution was to use VSDs to run pump one at 41 Hz, drawing 38 kW with pump two running at 37.5 Hz, drawing 28 kW. This means that both pumps run at 80 percent capacity, with 29 A spare, over the full load current for both pumps.

Running at this capacity means that the transformer is not overloaded and together the two pumps achieve a higher pumping volume than a single pump working at full rate.

The Shire Group's JBA Consulting worked with the authority's maintenance contractor, Lincoln Electrical Services, to find the solution.

Peter Mayo, managing director at Lincoln Electrical Services, comments: "We were asked to obtain several quotes for the work of improving the pumping system, and the proposal offered by Inverter Drive Systems was the best. They were keen to conduct a trial to prove the benefits of their solutions to us."

Inverter Drive Systems (IDS), an ABB authorised value provider, installed two 75 kW ABB general purpose drives and conducted a four week trial to determine the motor's best speed for optimum pumping.

During the trial, the normal pumping rate during non-storm conditions was optimised to achieve the lowest energy use for each cubic meter of water pumped. This has been set to match natural flow in the dyke, avoiding surges and unnecessary starts.

Following the trial the VSDs were fitted in a permanent installation.

Because both pumps can be run at the same time, the pumping system is more reliable and can run in fully unmanned mode. Sharing the load between the pumps means that there is no need to invest in a costly transformer, achieving further savings.

With lower speeds and soft starts, the VSDs place less stress on the motors, helping reduce wear.

Better control of the outflow also alleviates ditch erosion by avoiding water pressures that would damage the bank. Controlling the pressure also allows the water to push past the flap on the non-return valve, while avoiding the rapid drops that could cause the flap to fall back suddenly, potentially damaging it.

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**Caption:** Susworth Pumping Station expects to cut the energy use of two submersible pumps by between 10 and 15 percent following the installation of ABB variable speed drives.

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