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World's first IE4 SynRM from ABB

South Staffs Water UK

ABB

World's first IE4 SynRM installation from ABB

South Staffs Water, Somerford Pumping Station, UK

Background

- Utility is one of UK's most efficient, yet still has £9 million per annum electricity bill, 90 percent of which is used for pumping water

Challenge

- 20-year old, 115 kW induction motor controlling a single vertical shaft borehole pump needed replacing
- Existing ACS800 variable-speed drive gave good energy saving
- Improve efficiency and lower maintenance costs by deploying latest motor technology



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Solution

- Replace existing drive and motor with IE4, ACS850 & 110 kW synchronous reluctance motor (SynRM package) retrofitted to borehole pump abstracting 2.5 million liters per day

Benefits

- 6 percent energy saving over existing induction motor package – when lightly loaded, power consumption even less
- 58 percent reduction in frame temperature hotspot
 - Lower winding temperature – increases reliability



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Benefits

- 28 percent reduction in DE (drive end) bearing hotspot
 - Lower bearing temperature – extends period between greasing and lifetime of bearings
- 75 percent audible noise reduction – lowers impact on environment and residents
- Used same frame motors for trial to give like-for-like comparison but technology allows for smaller frame size to be deployed



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What the water utility says...

“The results have far exceeded our expectations. Pumping accounts for some 90 percent of our energy spend, so a 6 percent reduction on one pump in a system that was already very efficient is massive news for us. Suddenly other applications that might have had low priority become easy targets within our Investment Programme. This is such a sizable leap forward in technology over traditional induction motors that we are now considering other applications across our sites.”



Keith Marshall, Supply Director,
South Staffordshire Water PLC

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