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## Making two phases into three

Northumbrian Water is saving up to £50,000 by running its 3-phase equipment from a two-phase supply with the help of an ABB ACS400 drive.

The company's Winston village pumping station near Barnard Castle in Northumbria is on a split phase supply. Bob Dixon, Project Manager for Northumbrian Water, says: "This is a problem for many of our sites in rural areas. The electricity supplier often finds it impractical to provide a 3-phase supply to the more remote sites, making use of a split-phase arrangement instead."

A standard UK 3-phase supply will typically consist of a star connected 3-phase arrangement, with 120 degrees between phases, with neutral connected to the star point. This commonly gives 415V between phases and 240 V between phase and neutral.

By contrast, a split phase arrangement has only two phases available, 180 degrees apart. This gives 480V between phases and 240 V between phase and neutral.

Dixon added: "Essentially, this is a farm supply, which unfortunately does not have the capacity to run our larger pumps."

Winston village pumping station has two duty standby submersible pumps on a sewage pumping application. The pumps are 3kW units designed for 3-phase, yet the supply to the site is 480 V split phase. "Upgrading the supply to 3-phase would have cost up to £50, 000," says Dixon.

ABB Drives Alliance partner Slater Drive Systems (SDS) solved the problem. Using an ABB ACS 400 drive, SDS used the existing 2-phase supply to create a synthetic 3-phase supply.

Stuart Combe of SDS says: "This is quite a specialist job as not many electrical engineers will come across this arrangement in their careers. SDS pioneered this solution, which has now been approved by ABB and given their support."

Bob Dixon estimates that the drive is also saving 20 percent on the energy cost of running the pumps at Winston village, compared to the old fixed speed method. As well as this, the application benefits from the drive's soft start, saving mechanical wear on the motors.

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**Caption:** An ABB drive, supplied by ABB Drives Alliance member Slater Drive Systems, is helping Northumbrian Water to save up to £50,000 by running its 3-phase equipment from a 2-phase supply.

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