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# Optimisation projects cut drive costs for South West Water

South West Water has cut the energy and maintenance costs of variable speed drives in a series of optimisation projects.

South West Water (SWW) has saved up to £25,000 on the running costs of its variable speed drives (VSDs) following a series of optimisation projects that have also avoided the added expense of needing to replace drives early.

Working with ABB Value Provider APDS on several of SWW's sites, the projects also cut energy costs by up to £25,000 per drive per annum and reduced the frequency of filter changes.

SWW identified an energy saving opportunity at its Restormel Water Treatment Works near Lostwithiel in Cornwall. The eight drives at this site are of three ratings, 315 kW, 485kW and 523kW. The VSDs control the motors used to run the reservoir pumps, altering the speed of the motors to meet the actual pumping demand. The drives operated their cooling fans constantly, even when the drive was not being used for pumping.

The fans are used to maintain various parts of the drive enclosure at temperatures within the drive's operating range. The fans involved were the door fan, the main drive fan and the fan used to cool the LCL harmonic filters.

Working with ABB and APDS, a solution was developed using an ABB timer circuit on the internal 115V supply that would switch the fans off, via a relay, half an hour after the drive is shut down. The resultant savings in energy costs amount to around £1000 for each of the eight drives. With the retrofitted solution costing £1000, payback time for each drive is only 12 months.

As well as wasting energy, this constant operation also caused a problem with clogging of the filters on the door fan. Situated in a wooded area, cooling fans suck in the pollen and the filters become clogged with this and other biological debris, reducing the cooling efficiency of the fans.

Shayne Fielding, Efficiency Manager for SWW, says: "The clogging of the filters meant we had to replace them five times more often than we would expect. At £130 per filter this was a significant added expense. Blocked filters also reduce the cooling effect. Raising the temperature of a variable speed drive by 10C can halve its life."

Other treatment works include Littlehempston, Tamar Lakes and Pantacridge. At Pantacridge, the drives run on a duty/standby arrangement where one drive is always running and the other is always on standby. By preventing fans from running on the standby drive, it was calculated that around £900 per year could be saved.

APDS has also used flux optimisation at most of the 120 sites where ABB drives are fitted. This technique maintains the speed of the pump motors at 44 to 46 Hz via a feedback loop to achieve the Best Efficiency Point of the pumps on the pump curve. Flux optimisation provides the motor with the optimum voltage for any operating speed and load. This reduces the flux current needed and improves the efficiency of the motor.

Adds Fielding: “The reduced energy costs are welcome - depending on the loading of the drive and the power rating, some drives can save up to £25,000 in energy costs. However, the major benefit is the significant reduced capital costs from avoiding early replacement of the drives. These cost savings help towards keeping customer bills as low as possible.”

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**Caption:** The optimisation projects across various South West Water sites have reduced annual operating costs by up to £25,000 per drive per annum

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**For more information please contact:**

**Layla Hewitt**  
**Marketing Communications**  
Phone: 01925 741517  
Email: [layla.hewitt@gb.abb.com](mailto:layla.hewitt@gb.abb.com)

**ABB Ltd.**  
Daresbury Park  
Daresbury  
Warrington WA4 4BT