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Leixlip Water Treatment Works saves €500,000 a year with ABB drives

Leixlip Water Treatment Plant is saving over €500,000 a year on its pumping costs thanks to the installation of ABB variable speed drives.

The Leixlip Water Treatment Works in Co. Kildare is the second largest water treatment facility in Ireland. With a capacity of 175,000 m³ a day, it supplies over 30 percent of the drinking water requirements of the Greater Dublin Region, serving Fingal, Kildare and the northern part of Dublin City.

The treatment works has six pumps in two sets of three, one used for duty and the other on standby. In each set of three motors, two were controlled by soft starts and one was controlled by a variable speed drive (VSD). The control method used was to vary the speed of the one pump with the VSD and bring in the others as required. All three motors were running constantly to keep up with demand.

The pumps have butterfly valves which were throttled to maintain the required head. Pat Nolan, plant supervisor for Leixlip, says: “We were prompted to look at our energy use because costs had risen substantially.”

Contractor AECOM (formerly Earthtech) and ABB were asked to investigate the pumps’ energy use and come up with a solution to reduce it. The investigation found that the three motors had an absorbed power of 1,690 kW, a total made up of two soft start motors drawing 620 kW and the VSD driven motor drawing 450 kW.

The proposal concluded that major savings could be achieved by opening the valves and employing four more VSDs. AECOM says: “We certainly had no objection to using more ABB variable speed drives. We have been using them for ten years and were happy to continue using the same supplier. The drives have always been very reliable.”

Four 710 kW ABB cabinet built drives were installed in place of the existing soft starts and now work in conjunction with the two drives previously installed. Each new drive was installed without any disruption to the plant, maintaining full operation at all times. Before each drive was installed the associated motor was sent off-site to be fitted with insulated bearings on the non-drive end to resist the bearing currents generated by the drives and prevent the damage these could cause. It was also necessary to transfer the previous control logic and safety relays from the soft starts to the new VSDs. All this additional work took careful project management to ensure Leixlip was 100 percent operational at all times.

Following installation of the drives, all three motors run at the same speed, providing a flow of 5,700 m³/hr - the balance of the plant’s capacity is routed via other methods, such as gravity feed.

The new absorbed power is 1,326 kW, a saving of 364 kW. With 24 hour, 365 day operation, this was a saving of 3,179,904 kWhrs. With energy costing 0.16 c per kWhr, this gives a total saving of €508,784 per year and a payback time of less than a year.

“The savings were very significant and even more than we expected,” says Pat Nolan. “Another benefit was the reduced wear and tear on the discharge valve through using the variable speed system.

John Conboy, drives & motors manager for ABB, says: “The initial control logic at Leixlip made sense when the plant was built, however, with energy costs increasing all the time it is certainly worth investigating further opportunities for efficiency. The savings here are incredible”

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Caption: Leixlip Water Treatment Works is saving over €500,000 a year on its pumping costs thanks to the installation of ABB variable speed drives.

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