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ABB drives save Pfizer €28,000 a year on chiller applications

ABB motors and variable speed drives (VSDs) are saving Pfizer €28,000 a year on electricity costs for its chiller applications at its Ringaskiddy plant. Located in County Cork, Ireland, the plant produces a wide range of bulk pharmaceutical products for shipping to other Pfizer facilities worldwide for finishing and packaging.

The company had identified the plant chillers as prime targets for improving energy efficiency. The chillers use circulation pumps to pump heat transfer fluid to and from the cold storage tank. Pfizer process engineers had identified potential improved pumping efficiencies and had asked ABB drives and motors vendor Caltech, in association with EMSA Consultants, to investigate the possibility of reducing energy consumption on these drives.

An energy appraisal found that the application included three 45 kW motors and one 37 kW motor, all of them run with soft starters. For best efficiency of the process, the pumps needed to maintain a constant flow rate of 185 m³/hr, but the pumps were actually rated for 240 m³/hr. To achieve the optimum flow rate, gate valves were used to throttle the pumps.

Sean Lee of EMSA says: "In conjunction with Pfizer Process Engineering we decided that the best way of achieving both the optimum flow and energy saving was to open the valves fully and use variable speed drives to maintain the optimum flow. We found that we could achieve the desired flow rate by running the motors at 35Hz rather than 50Hz."

EMSA used ABB's Pumpsave energy saving calculation program, which predicted an energy saving of 50 per cent per motor, with cost savings for each motor of around €7,200, a total of over €28,000 per year. Based on a running time of 4,360 hours, this would give a payback time of two and a half years.

Pfizer was also able to take advantage of an Accelerated Capital Allowance scheme run by the Irish government that allows companies to write off 100 per cent of the purchase value of qualifying energy efficient equipment against their profit in the year of purchase.

A full turnkey solution provided by Caltech comprised new VSDs, installation, project management and supervision, drawings, commissioning and full handover to the client. New high efficiency ABB EEx de IE2 motors were also supplied and laser aligned with the pumps.

As well as energy saving, the project has had numerous other related benefits, such as a reduction in CO₂ emissions.

Says Lee: "Reliability will also be improved as high efficiency motors are less likely to break down and also should not require rewinding or need their bearings replaced for many years. Their cooler running temperature will also mean less mechanical stress."

As well as running the motors at lower speed, VSDs can be controlled by external signalling sources in order to maintain the best flow conditions. Pfizer hopes to eventually control the drives from the flow meters on the coolant pipelines, giving optimum flow control by matching the speed of the pumps to exact flow demand at all times.

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Caption: ABB motor and variable speed drives are saving Pfizer €28,000 a year on electricity costs for its chiller applications at its Ringaskiddy plant.

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