

# Pumps drive pay-back in 8 months and deliver 120 tonnes of carbon savings



**A major automotive gearbox manufacturer has realised energy savings of over £17,000 per year on the pumps driving one of their machine tool coolant fluid circuits.**

The company's local Danfoss Drives partner was recently called upon to conduct an energy survey of the machine tool coolant circuits which feed the machine shops with coolant solution. Waste-water is mixed with oil to create a low viscosity cooling solution that is sprayed over the cutting tools to cool and lubricate the cutting edges, thereby prolonging their lives.

This cooling emulsion is pumped round the machine shops to feed the various machine tools. Some high volume production tools require substantially more coolant than others. For this reason, while there is a low pressure ring operat-

ing at approximately 3 bar pressure, there is a 4 bar high pressure ring fed off that, boosted by a second pump, feeding the high volume production machines. Both the 37 kW low pressure and 30 kW booster pump motors were being run continuously at full, fixed speed.

**Inefficient system**

A preliminary survey and measurements revealed that the 37 kW pump, running continuously at full speed, was itself delivering in excess of the high pressure requirement, meaning that the low pressure ring was over pressurised, while the high pressure pump, working and absorbing energy, was not contributing in any meaningful way.

The system was operational in that it was delivering coolant to the machines but could not have been said to have been working within design parameters.

It was clearly identified that retrofitting Danfoss variable speed drives with pressure control feedback from the cooling circuits would bring the system under control and save sufficient energy to easily recoup the investment within one year.

**VLT® AQUA drives easily retrofitted**

The system was retrofitted simply and quickly with VLT® AQUA drives. Their compact size meant they fitted comfortably into the existing control cabinet and were easily integrated into the system, leaving the existing star/delta starters as an emergency bypass facility.

Danfoss 4-20 ma pressure transducers were fitted to both low and high pressure rings, immediately on the output of the pumps, to control the pressures at the design level, regardless of coolant demand on the shop floor.

**VLT® set-up software**

The integral PID controllers within the drives were quickly set up using Danfoss' MCT10 programming software. Total installation and commissioning barely disrupted production and added only minimally to the project cost.

**70% savings**

When commissioned the results exceeded predictions. Annual running costs fell to a projected £ 7,500, a saving of over 70%, delivering financial pay-back in less than 8 months. As energy costs continue to rise, even greater savings will continuously be delivered to the plant's bottom line. Savings also represent a significant carbon reduction in the fight against global warming.