

## Laundry saves £30,000 from flash recovery

Commercial laundry Bates of London is reporting savings of tens of thousands of pounds in energy since installing FREME (flash recovery energy management equipment) plant, from Spirax Sarco.

According to Spirax Sarco's calculations, installing the new system would save over £30,000 – a figure verified by a consultant from the Carbon Trust, which secured funding for the project.

"Due to other projects that were commissioned around the same time, it's quite hard to put an exact figure on it, but it is noticeably contributing to the overall savings we are achieving," states Bates of London managing director Matthew Pantlin.

"Our boilers now run much more efficiently with the Spirax system installed [and] I am sure the equipment

will have paid for itself within two years," he continues.

"We've invested quite heavily in energy-saving equipment for both



environmental as well as costs saving reasons," adds Pantlin.

"We had already installed some equipment to reduce the amount of flash steam being released, but we still had some losses that generated a flash

plume. The Spirax Sarco system was installed as part of a wider energy saving drive and successfully eliminated the remaining plume."

Spirax Sarco points out that returning condensate from the steam distribution system to the boiler house and using it to heat the boiler feed tank is an extremely effective energy-saving measure. Every 6°C temperature boost in boiler feed water knocks 1% off a typical boiler energy bill.

However, up to half of the recoverable energy in the condensate can be lost to atmosphere as flash steam, generated as condensate, leaves the pressurised steam system and returns to ambient pressure.

Spirax Sarco's FREME overcomes this problem and, where practical, enables the usable heat in the condensate to be returned to the boiler.

## Thwaites' green upgrade is picture of efficiency

Yellow dump truck manufacturer Thwaites' paint line has been refurbished – and improved its efficiency, but also environmental sustainability, on the way.

Steve Trotman, of Thwaites, explains that the line was installed 15 years ago at its Leamington Spa plant, but sections of the paint booth were corroded. And he adds that costs for cleaning and waste disposal were increasing.

So Birmingham-based Delta Process Systems was invited to survey the situation. It found two manual spray booths with pump-less water-washed exhaust systems for capturing paint over-spray – using high fan pressure to lift and atomise booth water for the washing action.

To maintain water level, the booths relied on pressure sensors, but too little water meant the efficiency of the scrubbing process would fall, while too much water led to the fan pressure struggling against the motor power, so dropping the booth exhaust air volume.

Meanwhile, chemical dosing was controlled and monitored using denaturant and flocculent to de-tack the paint and float the particles. However, removing floating paint waste was a manual operation, carried out several times per shift.

Finally, the scrubbing section was highly corroded, with clearly visible signs of patchwork repairs.

All that has now been replaced with Delta's Aqua-Cleanse automated paint waste removal system, which separates booth water cleaning from the paint booth operation – transferring it

from the two booths to a dedicated area. Aqua-Cleanse relies on chemical dosing and utilises two stages of treatment: a denaturant fed into the booth water circulation system to convert the paint into non-sticky solid particles; and a flocculent fed into water being pumped from the booth into the system.

To ensure correct dosing, chemical feeds are automated and linked to the operation of the spray applicator, so that dosing only occurs when the booth is painting.

The system controls flow of water through a holding tank, which provides a calm-zone that enables the flocculent to adhere to suspended paint solids and allows solids to float.

With the addition of weirs, the surface flows gently towards a collection chute, with floating paint solids forming an increasingly dense raft of waste. A pneumatically driven scraper blade then removes and deposits the waste into a collection bag.

Separately, because the spray booth scrubbing systems were unfit for repair, the booths were converted to Delta Aqua-Flow booth design, which works with the Aqua-Cleanse system, so that no standing water is held on switch-off.

Trotman explains that the modified booths have been arranged back-to-back, with an intermediate corridor of 1.5 metres to allow access into the scrubbing chambers.

He also says that the existing large centrifugal exhaust fans were upgraded with new impellers, drives and bearings.



## Automation opens doors to cathedral

Using a motor from Rotor UK, design engineers from Drive Lines Technologies have developed a discrete and sensitive solution to motorising a huge medieval door at Ripon Cathedral in Yorkshire.

Visitors to the Cathedral Church of St Wilfrid in Ripon can now admire its medieval interior in greater comfort, following the installation of the Narthex Porch into the main frontage.

Drives engineer Patrick Logue explains that it was an essential part of the plan that the original door was retained, to maintain the historic front.

"The arch-shaped doors are 5.5m tall and over 2m wide, made of ancient oak and hung on what may be the original hinges," states Logue.

"The load was considerable and we also had to allow for possible wind load, but above all, we had to respect the antiquity and solemnity of the site, and



come up with a solution that was compact, quiet, discrete and which could handle the doors gently," he adds.

Logue considered specifying an off-the-shelf door mechanism, but was not that surprised to discover that there was nothing suitable on the market.

He decided that a powered, pivot-mounted lead screw was the optimum solution, as this would give a smooth, steady motion, and would be reliable,

long lasting and quiet in operation.

Speaking of the motor, he says: "We wanted something small and discrete that would be virtually invisible to the casual observer.

"Reliability was a given and we were also keen to find a standard motor that the cathedral's maintenance staff would be comfortable with. Fortunately, there was an existing three-phase supply on site, so we were not restricted to finding a single-phase solution."

Eventually, the design team opted for a three-phase, 0.6kW IEC frame motor from Rotor. "This may seem small, considering the job, but it is stepped down through a compact 50:1 ZF-Servoplan planetary gearbox," explains Logue.

"Even with the switchgear, we were able to produce an elegant and effective solution," he adds.

## Steel maker set to save £68,000 on pump energy

Tata Steel in Rotherham is set to save £68,000 a year on energy costs associated with pumping, following installation of five ABB drives from Halcyon Drives.

Ben Holroyde, a member of the engineering team, says that Tata Steel identified its flume flush pumps and filter feed pumps as prime candidates for energy improvement. All these units were driven by motors running direct-on-line, with no speed control and only simple logic to determine pump operation.

Tata Steel's engineers established not only that variable-speed drives would provide significant savings, but also that only one of the filter feed pumps should be needed.

A hired drive was installed for the trials, with current logged on one of the filter feed pumps, under the original, valve-based flow control. Results showed that, with two pumps running, annual energy consumed was over 355,000 kWh, at a cost of more than £46,000.

The variable-speed drive was then set up on one of the pumps, with control linked to a level transducer. Results confirmed that a single pump was adequate and that energy fell to just over 131,000kWh at a cost of £8,500 – saving £37,600.

For the flume flush pumps, a similar exercise showed that energy usage would fall from 565,000kWh to 323,000kWh, with costs falling from £73,500 to £42,000 – a saving of over £31,000.



## NSK's L-PPS bearings solve heat-induced failures

NSK's L-PPS bearing cage technology has improved long-term performance and cost for an unnamed manufacturer of screw compressors in the refrigerant sector, according to the company.

The bearings manufacturer says its client was receiving "frequent complaints", due to compressor failures, resulting from damage to bearings operating continuously at temperatures above 70°C.

It's an increasingly common problem in an industry demanding longer intervals between overhauls.

NSK says brass or polyamide bearing had been designed in, but that the brass cages were exhibiting stress corrosion cracking, while the operation of the polyamide cages was impaired by lubricant at high operating temperatures.

After examining the failed bearings, NSK recommended bearings with cages made from L-PPS (linear polyphenylene sulphide), a glass fibre reinforced plastic designed for use at up to 190°C, developed by NSK.

Following the introduction of the new bearings, complaints of failed bearings ceased. NSK says that, although developed for compressor applications, bearings employing L-PPS plastic cages are applicable in other applications where high temperature and/or special conditions exist.

Additional benefits claimed for the material are that its strength and chemical stability change little, even when used with compressor oil, refrigerator oil or ammonia gas.

