

Ricoh saves £100,000 with plant-wide drives

Office equipment manufacturer Ricoh reports savings of more than £100,000 per annum at its plant in Telford since installing ABB variable-speed drives.

Ricoh energy specialist Andy Smith (pictured, left) explains that the 52-acre site has a large number of air handling units (AHUs), and water circulation pumps and compressors, contributing to a utility spend of £1.25 million pa.

He says the plant initially trialed two hired ABB drives – one on a pump and one on an AHU – to prove their abilities.

“The results were very favourable, encouraging us to evaluate all possible motor-driven applications on site for energy-saving potential,” says Smith.

“Our project prioritisation process evaluated criteria such as CO₂ saved, technical complexity, risk and return on investment,” he explains.

Having identified drives as among the keys to energy saving, because of their simplicity and payback, he says the firm



embarked on a programme of retrofits, 90% of which have been done.

Smith says a total of around 70 drives now run a variety of applications around the site, with an average payback time of around six months per installation.

He also claims that Ricoh improved control over several of its processes. An example is the laboratory, where toner is tested. To achieve optimum tests, temperature and humidity must be constant to within 0.5°C, which has been

achieved by controlling air flow.

An ABB drive-controlled humidifier also ensures that humidity varies by no more than 1.5in. “An important feature in this application was flux optimisation,” comments Smith. “Even at 50Hz, with no speed reduction, this reduced power from 5.5kW to 3kW.” And running at 35Hz, consumption was further reduced to just 1.6kW – a three-month payback.

“We use three drives to synchronise two conveyors with a 22kW plastic granulator that grinds plastic parts for recycling,” says Smith. “Linked to a PLC, this allows us to run the granulator on-demand. Run time has been reduced by 95%, dramatically cutting energy use and increasing equipment service life.”

He also refers to the ABB drives’ supervised relay output, which allows them to control motors dependent on the status of connected equipment, and their Modbus compatibility, which allows control over a PLC network.

Tamar Foods cuts HVAC energy by 23%

One of the UK’s largest producers of pastry-based products is reporting 23% energy cost savings on its HVAC plant, following installation of ABB variable-speed drives.

Tamar Foods, which manufactures five million sausage rolls, pasties and pies every week for major supermarkets, installed the equipment at its Callington, Cornwall plant.

“The project was suggested to us by Inverter Drive Systems and we asked them to proceed with a free energy survey of our applications to pinpoint the largest savings,” explains Thomas Parrott, health, safety and environmental manager for Tamar Foods.

IDS says the plant’s HVAC system was found to account for around 15% of total electricity consumption at Tamar, so recommended retrofitting the HVAC system with 11 ABB standard drives, with ratings from 15 to 45kW.

“Because we use sub-metering, we are able to distinguish the energy costs of the HVAC and refrigeration systems,” says Parrott. “Before installation of the



drives, we were using 2,600kWhrs a day for the HVAC system. After the installation, this fell to 2,000kWhrs – a saving of around 23%.”

Another obvious candidate was the 45kW chilled water pump on the company’s refrigeration system. All products at the plant are chilled before despatch and the refrigeration system accounts for approximately 60% of the

plant’s total energy consumption.

IDS installed a 45kW ABB drive on the chilled water pump and, says Parrott, this is now saving the company 43% on the pump’s electricity costs, with a payback time of less than 12 months.

“As well as the large saving, the short payback time is also welcome,” comments Parrott. “Because of the economic climate, we need to have payback times of less than two years.”

He also indicates that Tamar Foods has achieved additional benefits from the drives installation, including an increase in motor life, and reduced maintenance and labour costs.

“These are fantastic savings for us,” he says. “They also save CO₂ emissions and have contributed to us winning the Best Managed Large Business at the Cornwall Sustainability Awards.

“This puts us ahead of our rivals and improves our standing with the major supermarkets, which are all keen to source products from suppliers who can demonstrate a more sustainable production process.”

Absolute Energy levels on guided wave radar

Absolute Energy is reporting increased uptime and reduced energy costs since changing to Emerson's Rosemount guided wave radar (GWR) to monitor water level in a condensate receiver.

The giant ethanol plant, near Lyle, Minnesota, USA, installed the system on a sieve dehydration process and reckons it has helped avoid shutdowns costing up to \$20,000 an hour, as well as potential equipment damage costing more than \$200,000.

"Our condensate receiver levels went from being a constant headache to hardly noticeable, because the GWR is so reliable," states Travis Rosenberg, maintenance manager at Absolute.

"The increased reliability has helped us to lower the risk of equipment damage, increase plant availability, decrease energy and utilities costs, and reduce maintenance costs," he adds.

Rosenberg explains that the condensate receiver is critical to



continuous operation of the heat exchanger and molecular sieve dehydration process.

If water levels get too high in the receiver, temperatures in the heat exchanger drop, which can cause wet ethanol to enter the molecular sieve beds. This forces the process to be shut down, while the ethanol-water mix is reprocessed.

If temperatures dropped in the heat exchanger and the upset occurred before the wet process stream was sent into the sieve beds, the heat exchanger had to be shut down and restarted – taking 20–30 minutes.

However, if the upset occurred and the sieve beds got wet, the process had to be shut down for 36 and 48 hours, because the beds had to be regenerated and restarted.

Previously, level was measured using differential pressure transmitters. However, excursions from high vacuum to low pressure made it challenging for DP, because fill heights in the wet legs varied too much, leading to 20% errors.

Hence the move to Emerson's Rosemount 5301 GWR transmitter and the 9901 chamber for externally mounting – enabling the instrument to be isolated for routine maintenance, while keeping the plant operational.

Poultry power generates brass from muck

Green technology firm Ener-G is using chicken litter and maize to help a Hereford chicken farm become more eco friendly and generate additional income from renewable energy.

Great Ynys Farm in Hereford, which has 125 acres of arable land and a 90,000 broiler chicken operation, will use anaerobic digestion (AD) to convert chicken litter into biogas for renewable electricity and heat generation in a combined heat and power operation.

The renewable electricity generated will power the poultry houses and the AD plant itself, with an impressive 90% surplus sold to the National Grid. Additionally, captured waste heat will provide warmth for the chicken houses, eventually eliminating the requirement for fuel oil and propane gas. Generation is scheduled to begin on 1 August.

Susan Shakesheff, director of Ynergy, the farm's new green power company, explains that her new AD plant can process 700 tonnes of poultry litter and 1,000 tonnes of cattle slurry, mixed with 3,000 tonnes of maize silage per annum.

Using the maize reduces nitrogen levels in the digestion process and prevents build-up of high concentrations of ammonia that would otherwise arrest the biogas production, she states.



The new plant will provide 250kW of electricity, sufficient to power 450 homes, and 200kW of heat – so qualifying for payments from the government's Feed in Tariff and Renewable Heat Incentive programmes (14p per kW on electricity generated and 6.5p per kW for heat).

Shakesheff says that plans are in place to convert the heating system in the farm's broiler houses within the next few months to utilise heat from the biogas generation process. She reckons payback on the initial investment will be achieved within one year.

Incidentally, the digestion process also produces a residue of 5,000 cubic metres of odourless organic liquid fertiliser that will be injected into the soil to provide an enhanced nutrient source for the maize crop. Shakesheff explains that the farm already uses its poultry litter as a fertiliser, but that, by digesting it, methane losses to the environment during spreading will be eliminated.

"We are proud to be at the forefront of the move to anaerobic digestion, and to improve our sustainability and energy self sufficiency, while securing a new income stream," states Shakesheff. "We are able to find a superior alternative for utilising our chicken litter and are helping neighbouring dairy farmers to recycle their cattle slurry."