

Helping Mr Kipling Keep his Cool

A decision to install power and temperature monitoring systems on critical cooling plant at Premier Foods Carlton bakery has resulted in substantial energy savings for the baker of Mr Kipling's Cakes

When refrigeration engineers, IRS Ltd, were appointed as the preferred service provider to Premier Foods at their giant Carlton bakery near Barnsley, one of their first actions was to deploy temperature and electric current monitors on the bakery's cooling plant. The results identified major imbalances in the system which were corrected, resulting in energy savings of over £60,000 a year and a £25,000 reduction in maintenance costs.



Premier Foods is one of the UK's largest producers of branded foods, counting famous names like Ambrosia, Bisto, Hovis, Batchelors and OXO among its brands. But one of the best known is that baker of "Exceedingly Good Cakes" - Mr Kipling. Mr Kipling's cakes and a range of other products are produced at Premier Foods' giant bakery in Carlton near Barnsley, S. Yorkshire, where 16 production lines conjure up a range of fruit pies,

Vital

Cooling plays a vital role in the production processes, but is also needed for air conditioning in the huge production hall. Until 2009 the 16 production lines were served by four reciprocating compressors, which supplied chilled glycol for cooling products and ingredients. Air conditioning had been handled separately by a large centrifugal chiller, which was removed in 2009 because of its age and the type of refrigerant used. At the same time it was decided to combine the production and air conditioning glycol circuits and purchase a new screw compressor set to supplement the reciprocating systems. The updated system gave Premier's engineers sufficient cooling for the entire production hall from one glycol circuit.

Serious issues

When IRS was appointed as Premier Food’s preferred service provider for refrigeration and air conditioning systems at Carlton some 12 months later, it quickly became clear that the reciprocating compressor packs had serious issues, which were affecting their reliability and efficiency.

Working with Premier Foods’ engineers, IRS carried out numerous tests to determine the balance between the actual factory cooling requirements and the available duty of the cooling systems. IRS had also installed Pico temperature and electrical current monitors on all the main systems, logging readings every five minutes for approximately two weeks. The tests produced some surprising results. They showed that, while the reciprocating compressors appeared to be working flat out, they were only providing similar cooling duty to the screw set operating at partial load.

Elegantly Simple

The solution was elegantly simple, to reduce the setpoint on the screw compressor so that it was 2°C lower than the setpoint on the reciprocating compressors. So long as the screw set could maintain that temperature, the reciprocating compressors would not operate. This has meant that the bakery’s cooling requirements are now met principally by the screw compressor with the reciprocating compressors only coming into operation during peak demands. In fact one of the reciprocating compressors sets, consisting of two compressors, has been mothballed as it is no longer needed.

The reduced duty cycle of the unreliable reciprocating sets and the fact that it has been possible to take one set offline, has had a major impact on the maintenance and repair costs, saving around £25,000 a year.

IMPRESSIVE GREEN RECORD

The energy savings achieved by the new cooling regime add to the bakery’s already impressive record for reducing its carbon footprint.

In 2012 engineers at the plant managed to cut the gas bill by £110,000 a year after installing a heat recovery system on the equipment used to heat the ovens and offices.

The site has also managed to reduce its use of water from 440 cubic metres a day in 2011 to 330 cubic metres in 2012, a 25% reduction. The total amount of water saved across

Annual Estimated Savings	Before	After	Saving
Energy Costs			
Reciprocating Compressors	£97,000	£15,000	£82,000
Primary Pumps	£9,000	£9,000	£0
Condenser Fans	£4,300	£1,000	£3,300
Screw Chiller	£15,000	£40,000	-£25,000
Total	£125,300	£65,000	£60,300
Maintenance and Repair			£25,000
Total Savings			£85,300

Knowledge

Mark Parsons, Managing Director of IRS said: “This was a great result for Premier Foods. What we have done sounds very obvious in hindsight, but unless you are monitoring these systems closely, it is easy to assume that all is well – especially if everything seems to be running without problems.

“We are never happy until we understand an installation thoroughly and that usually involves regular monitoring so we are always acting from knowledge and not assumptions,” he said.

