



Topic

Proactive Maintenance to Optimise Efficiency and Reduce Lifecycle Costs

Author

Valgard Bertschinger
Business Development Manager -
Operations



How proactive maintenance can optimise efficiency and reduce lifecycle costs of refrigeration plants

There is no doubt that the initial capital investment made by customers when purchasing and installing refrigeration plant is significant. However, this figure typically only represents around 15% of a refrigeration system's total lifecycle cost.

By far the largest ongoing operational cost is energy, with electricity accounting for over 70% of a plant's total lifecycle cost. Maintenance and servicing, including component replacement, accounts for up to 15% of the remaining financial expenditure.

Long-term lifecycle costs should always be taken into account in the initial design of a refrigeration system. The best components should be selected to suit the application and deliver optimum energy efficient operation throughout the expected lifespan of the plant, which is usually in excess of 20 years and can be up to 40 years for industrial refrigeration plant.



Once the design is completed, components have been selected and the system is built and installed, the foundations are set in terms of what it is possible to achieve during the plant's lifespan from

an efficiency point of view. Optimising the efficiency of a refrigeration plant doesn't stop at the commissioning and handover of the system. A proactive programme of planned preventative maintenance (PPM) is key to ensuring that plant is maintained at an optimum level of efficiency throughout its lifespan.

As one of the UK's leading aftercare providers for industrial refrigeration systems, Star focuses on asset management through proactive maintenance to maximise plant efficiency and reliability. Each PPM programme is carefully tailored to monitor efficiency and prevent drift from optimum performance in order to achieve the lowest possible running cost. Star's aftercare team continuously reviews and compares plant performance against the original design parameters and looks for ways to improve efficiency.

At our Monitoring Hub in Glasgow, specialist engineers use the latest technology to monitor plant health, to help avoid costly system faults and component breakdown. Remote monitoring enables senior engineers to regularly review operational data and alerts, which detect movement away from design conditions. These can provide an early warning of a reduction in efficiency and help identify potential future operational issues. Once data has been analysed remotely, remedial task lists are created for field engineers to attend to on site.



Star has recently invested in the development and implementation of Ethos, a smart remote monitoring

system which collects real time operational data to track plant performance 24/7. Ethos uses sophisticated software to create a 'digital twin' of each plant, automatically comparing current operational data with optimum performance.

Keeping a plant running at optimum efficiency parameters throughout its lifecycle has a significant effect on reducing ongoing energy costs. Ethos is proven to reduce annual energy consumption and associated costs by up to 30%.

As a refrigeration plant ages, there will inevitably be an amount of capital investment required to replace and overhaul key components. Star uses sophisticated technical analysis techniques to maximise the lifespan of the system and minimise costs. Analysing the metallic content of oil samples for example, can provide a useful early indication of component wear. Through regular vibration analysis on the compressor, engineers can accurately estimate when a bearing should be replaced or when the compressor should be overhauled. In turn, this level of system analysis enables engineers to extend the life of components and helps to significantly reduce operational costs.

One of the additional benefits of our proactive and predictive approach to aftercare is in assisting customers with capital expenditure planning. A five to ten-year capital plan is produced and regularly reviewed in line with plant performance and maintenance activities. This enables customers to accurately budget and plan for capital expenditure, to keep their refrigeration system operating at an optimum level of efficiency throughout its lifespan.

Maintaining optimum efficiency to reduce energy consumption and cut lifecycle costs lies at the heart of industrial refrigeration system maintenance. Beyond traditional PPM activities, Star's Operations team uses the latest remote monitoring and engineering technology to deliver proactive and preventative aftercare. This unique approach is proven to save energy and reduce running costs throughout the lifespan of the plant, delivering the best return on investment for our customers.

To learn more about how Star can help your business through proactive maintenance support, please contact Valgard Bertschinger at vbertschinger@star-ref.co.uk

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Star Refrigeration

Thornliebank Industrial Estate, Nitshill Rd, Thornliebank, Glasgow G46 8JW

Tel: 0141 638 7916 star@star-ref.co.uk

@StarRefrig

www.star-ref.co.uk



The Star Refrigeration Group

