

KNOW + HOW

Issue 33

ASSET MANAGEMENT

How to achieve optimal plant performance with a deeper understanding of asset management, predictive maintenance, product life cycle and the impact they can have on risk management.

IN DEPTH:

Where are you now, where do you want go?

ERIKS explains how operating and maintaining your process and production equipment should never be a straight-line journey.

IN FOCUS:

Modern Trends on Asset Management

How data, automation and collaboration are changing organisational structure with the aim of improving plant efficiency and reliability.

DEBATE:

Going green with electric cars is all well and good but have we got the power to cope?



The SKF Bearing Life Cycle

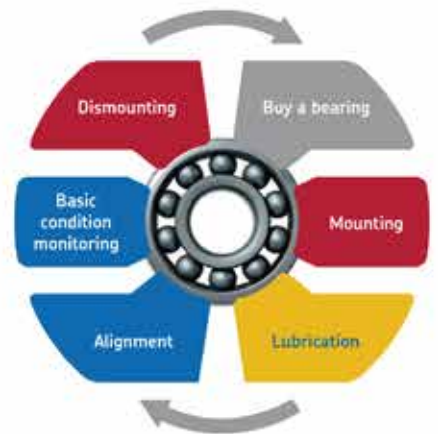
Help your bearing achieve its maximum service life

Every bearing has a certain service life potential. However, research has shown that, for various reasons, not every bearing achieves it. Important stages which have a major impact on a bearing service life can be recognised during the bearing's lifecycle. These stages are mounting, lubrication, alignment, basic condition monitoring and dismounting.

The stages in a bearing life cycle are extremely important for achieving the maximum service life of the bearing. By applying the

right maintenance practices and using the correct tools, you can considerably extend your bearing's service life and increase plant productivity and efficiency.

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SKF



KNOW +HOW Welcome



It's hard to believe that we are already four months into 2018, particularly when you consider the snow, cold and Beasts from the East that we have suffered. After all, it's not easy anticipating the arrival of spring when winter won't let go.

Having said that, the ghastly weather that we endured for the first three months of the year did serve as an important reminder of the importance of forward-planning and preparation. How many of us have marvelled at the tidal wave of bus and train cancellations at the first sign of frost, or grumbled in frustration as we go to grit our drives, only to discover that the container is empty?

This issue will, therefore, look at asset management: the concept of using foresight, insight and strategic thinking to avoid disruption or damage to productivity and routine. While we're not promising that it will offer a magic cure for the sometimes-delicate British transport system, we are pretty sure that it will help you to stock, maintain, monitor and predict with the best of them.

On page 34, for example, we take a look at why maintaining and rotating spares stock is as important as the upkeep of your in-line equipment. Page 30 reveals how scheduled surveys can uncover all manner of hidden surprises in places you may not have

thought to look, while page 16 examines why reliability and safety cannot exist without one another.

This issue's debate, which you can read on page 46, looks at electric cars and how we can manage their biggest asset: electricity. It's great that we are finally taking our carbon emissions seriously, but without the right infrastructure in place, the ambitious plan for petrol and diesel-free roads from 2040 may be nothing more than a fairy tale.

Regular readers may also have noticed our shiny new website, which was launched earlier this year. As well as information on our products and services, you can also access our range of KNOW+HOW content from past and present issues. Take a look at eriks.co.uk, and be sure to let us know what you think!

Richard Ludlam
Editor-in-Chief



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UK SURVEY AIMS TO DELVE DEEPER INTO **PRODUCTIVITY AND** **CULTURE IN MANUFACTURING**



A major national survey has been conducted by SWMAS (part of Exelin) to delve deeper into the UK's productivity puzzle.

With a special focus on 'productivity and culture', the Winter 2017/18 (Q3) Manufacturing Barometer survey has asked UK SME manufacturers to have their say on everyday productivity in the sector.

The survey has posed questions to get management teams to consider what measures, processes and investments they use to boost performance and efficiency.

It has also sought to find out how SMEs are faring, with firms invited to provide updates

on performance, plans for investments and recruitment intentions.

The findings are expected to help inform government of the support needed by the UK manufacturing sector to meet productivity and growth objectives.



REPORT REVEALS HOW **MANUFACTURERS ARE** **COMMUNICATING** WITH CUSTOMERS AND SUPPLIERS

The route to smarter manufacturing for SMEs, a recent study conducted by The Manufacturer and Oracle/Netsuite, explores the views of UK manufacturing SME executives and decision-makers towards intelligence and connectivity.

According to the study, 90% of UK SME manufacturers are using paper, email, faxes and phone as their primary methods of communication. Furthermore, only 18% of SMEs collaborate with suppliers using an internally hosted portal and just 3% use a collaborative hub.

Its findings have therefore revealed that manufacturing SMEs are yet to embrace smart, data-driven communication and collaboration systems to correspond with their customers and suppliers, despite the advent of digital technology.



EPSRC WELCOMES **YEAR OF ENGINEERING** WITH SUPPORT OF PROJECTS

The Engineering and Physical Sciences Research Council (EPSRC) has announced its support of the Year of Engineering by investing £6.6m in 28 pioneering new research projects.

As part of the Year of Engineering, hundreds of UK organisations will be hoping to inspire the next generation of engineers by bringing young people face-to-face with engineering experiences and role models.

The projects that EPSRC are supporting are from 17 different universities, and could potentially transform fields ranging from autonomous vehicles to energy storage and healthcare technology.

Research areas include the use of diamond quantum technology to investigate neurological diseases such as Alzheimer's Disease, and the investigation of new solutions to antimicrobial resistance in

UFI HELPS TO IMPROVE VOCATIONAL SKILLS IN MANUFACTURING WITH **£1M GRANT**

The Ufi has distributed a share of its £1m Manufacturing Skills Fund (MSF) to the Coventry-based MTC, one of the UK's High Value Manufacturing Catapult centres. The fund, which was opened in October last year, aims to develop the use of digital technology for vocational learning in the manufacturing sector.

The six-figure donation will be used by the MTC to design an online resource to help manufacturing SMEs to identify skills gaps and embrace emerging digital technologies. This comes at a time when demand for UK manufacturing is at its highest for a decade but there is concern over a widening skills gap in the manufacturing sector.

Other recipients of the Ufi's Manufacturing Skills Fund were the National Composites Centre and the Association of Employment and Learning Providers.



DIAMONDS ARE A HAND'S BEST FRIEND

Patented Dyneema® Diamond Technology makes the new THORMASAFE Diamond Cut gloves – exclusive to ERIKS – the most effective cut-resistant gloves on the market.

Many workplace injuries occur because workers won't wear safety gloves. That's because traditional steel and glass fibre versions are hot, heavy, brittle and uncomfortable. So the new Diamond Cut range has been designed for comfort as well as protection.

There are 5 gloves in the range, all complying with the new EN388:2016 standards. Options are cut level B or D, with a choice of uncoated, polyurethane or nitrile foam coating.

The coated versions all meet the highest abrasion- and tear-resistance ratings, whilst the uncoated Diamond Touch B is a highly dexterous touchscreen-compatible glove.

Combining micro-particles within very thin, pliable fibres, and adding a unique high-strength, highly durable polymer, Diamond Cut gloves are not only extraordinarily strong and lightweight, but also radiate heat away from the hand for extra wearer comfort.



HIGH-SPEED DEVELOPMENTS

The advances being made in High Speed Steel (HSS) cutting tools show no signs of slowing down, with Dormer Pramet's Shark Line taps clearly setting the pace.

The high wear resistance, hardness and toughness of HSS makes it the ideal material for cutting tools in mass production environments. Able to resist vibrations regardless of work-piece clamping conditions, HSS can also prevent mechanical shocks at tooth level in milling operations. Even varying lubrication conditions and thermal changes are no problem.

Now two new designs from Dormer Pramet extend the capabilities of its Shark Line program of material-specific taps.

Manufactured from a High Speed Cobalt Powder Metallurgy Steel (HSS-E-PM) substrate, these tough and stable taps offer superior grind-ability of structural, carbon and low alloy steels (Shark Line E412) and stainless steels (E414). Both new taps feature a 48° spiral flute angle for smooth, fast, chip evacuation, making them ideal for threading deep blind holes up to 3xD.





MORE **TORQUE ACCURACY** WITH **LESS POWER**

The latest version of the Rexnord Monitorq process torque measurement device dispenses with batteries, and provides increased torque signal accuracy at 1% of full-scale torque.

Comprising a strain-gauged torque ring and an E-90 Sensor, the system uses state-of-the-art inductive power from the sensor, which also receives the radio signal from the ring.

The signal is then converted into an output signal proportional to the torque, and can be connected directly to a control system or displayed on a dedicated screen.

The Monitorq is designed to be integrated into a drive line at any point, using standard power transmission products such as couplings, pulleys and gears.

Once installed, it can enhance equipment performance by – for example – providing overload protection to production or process control, or condition monitoring as part of a preventative maintenance programme.

A BREATH OF **FRESH AIR**

The latest grinder from Bosch offers an effective new solution to the problem of dust collection.

As the OSHA begins to look more closely at silica dust regulations, the need for a concrete surface grinder which can deal with the dust issue has never been greater. The next-generation Bosch CSG15 Concrete Surfacing Grinder with Dedicated Dust Collection Shroud is the tool for the job.

The addition of an effective dust guard system doesn't make the grinder any less manoeuvrable. It can still grind flush against walls, and reach areas that walk-behind units can't.

The CSG15 five-inch grinder not only protects users and the environment with its dedicated dust-collection shroud. It also protects itself, with a sealed motor, sealed switch, double-sealed ball bearings and two lip-sealing rings.

The result is a longer operational life of concrete grading, surface preparation and other tough concrete applications.

SEIZE LESS STAINLESS

The anti-corrosion properties of stainless steel have led to its widespread use in the food industry. However its susceptibility to pick-up, galling and seizure is a downside in machinery joints and fasteners. Rocol has the answer.

New Rocol FOODLUBE Anti-Seize grease has been specially developed for the food industry, and optimised for use on stainless steel. The latest addition to Rocol's Kosher certified, NSF and ISO21469 registered FOODLUBE range, FOODLUBE Anti-Seize retains its consistency and doesn't set firm, even in high temperatures or humid environments. This makes it ideal for use in areas where regular wash-downs, controlled machine assembly or easy dismantling are required.

Suitable for joints, threaded fasteners, fixings, screws, bolts, nuts and washers, a single 500g tin of the grease will lubricate up to 1,000 fasteners. Helping to protect components in stainless steel and a variety of other metals, FOODLUBE Anti-Seize makes dismantling easier, reduces unscheduled downtime, protects components and extends machine life.



IN DEPTH



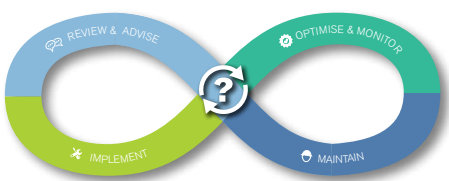
**WHERE DO
YOU GO
FROM HERE ?**



Where you go next with your operating assets depends on where you are now and where you want to get to.

Operating and maintaining your process and production equipment should never be a straight-line journey. If you're going to optimise its efficiency and minimise its Total Cost of Ownership, it demands product lifecycle management from beginning to end – and then back to the beginning again.

Asset Cares Program



INTERVENTION

Take corrective action to adjust process back to target

OPERATION

Ensure the asset performs as required in operation

Though product is at the heart of everything ERIKS does, it's not an end in itself.

You don't take care of a hammer because you want a well-maintained hammer. You do it because you want to be able to knock in nails effectively. In the same way, ERIKS takes care of the products customers use, because we want to help them achieve their strategic goals. We want to make industry better.

That's why it's important to look at the bigger picture of product lifecycle management.

Where are you now?

Review and Advise

The first step is to review the current condition and performance of the asset you're concerned about. Is it doing what it's supposed to do, and delivering against your requirements? If not, ERIKS has the industry experience, and the product and application expertise, to advise you on the most effective solution or choice of options to achieve your goals.

This could be something as simple as the repair of a failing component. It could be adaptation and customisation of the asset to make it more effective in your application. Or it may be a complete overhaul or upgrade.

Whatever the required solution, ERIKS' know-how, engineering skills and product range will help you to implement it.

The best gets better

Implementation

The solution applied to your asset will be the best available to meet your needs and budget, and to fit your strategy. But that doesn't mean it can't be improved over time.

Once the asset is repaired or upgraded, or a new one installed, ERIKS will adjust its working parameters and control systems to help you optimise its operational efficiency and minimise its Total Cost of Ownership. And even then, we don't walk away.

ACHIEVE YOUR STRATEGIC GOALS AND MINIMISE YOUR TOTAL COST OF OWNERSHIP

Operating conditions change. Production requirements vary. Components bed-in or wear. That's why it's essential to monitor the condition of your assets to provide the information you need about their ongoing condition and performance.

We call this approach **"Foresight and Insight."**



Foresight and Insight

Optimise and monitor

Foresight comes from data and experience. Data informs, experience guides, and the result is knowledge indicating the rate of change, location and severity so we know when something is going to happen.

Insight then goes even further. It means that you not only know when it's likely to happen, using the data and our knowhow you know what's likely to happen, you know to what extent – and as a result you know how to be prepared to deal with it.

That doesn't mean you sit back and wait for it.

Maintain

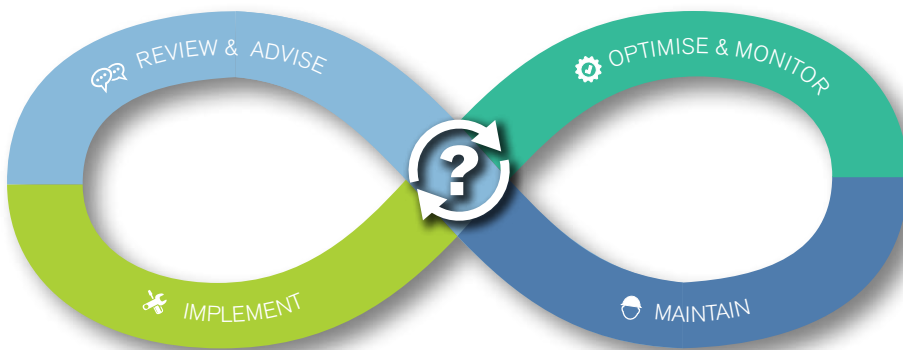
An essential element of product lifecycle management is maintaining your assets in accordance with the manufacturers' schedules – often aided by the foresight and insight provided by condition monitoring. ERIKS' engineering maintenance expertise can provide the specialist support and flexibility you need to keep your assets operating at their optimum efficiency for their entire service life.

What goes around... ..comes around.

And that doesn't just mean rotating equipment.

Sooner or later – and with careful maintenance it should be later – any asset will reach a point where it's no longer efficient, is unsafe, is at risk of obsolescence, or is simply at the end of its life. When that happens, you've come round again to the point where you need to review its current condition and performance, and ask yourself if it's doing what it's supposed to do and delivering against your requirements. If not, then you need advice on the most effective solution, or choice of options, to achieve your goals.

And as we've also already said above, ERIKS has the industry experience, and the product and application expertise, to advise you. So where do you go from here? Your local ERIKS Service Centre.



OPTIMUM
EFFICIENCY
FOR THE
ENTIRE
SERVICE LIFE





IN FOCUS

**STRESS FREE
ASSET
MANAGEMENT**

MODERN TRENDS ON ASSET MANAGEMENT

How data, automation and open collaboration are changing organisational structures

When it comes to asset management, are you a dawdler or best-in-class? If your business has not invested in new IT and technological infrastructure to support asset management in the last five years, then the answer may surprise you.

The manufacturing world adores its acronyms. For busy, time-stretched professionals, they are a great way to convey meaning quickly and succinctly. The problem is that they are often used as a form of code, incomprehensible to those not in the know. This often makes new developments within manufacturing practice difficult for some to grasp.

Asset management is no stranger to the acronym onslaught. Ten years ago, the concept of EAM (or Enterprise Asset Management) was introduced as a means of focusing an enterprise's time, efforts and resources on harnessing asset performance in a way that would make a significant, positive impact on the bottom line.

It has since come to encapsulate how we understand asset management, although it is less relevant when considering the practical elements of strategy and implementation.

This responsibility falls on Enterprise Resource Planning (ERP), which entered the day-to-day manufacturing language as technological structures became more sophisticated, and more advanced. It essentially embodies the idea of a fully-integrated business management system that covers functional areas across the business, from logistics and production, to finance and accounting.

Processes, information and data are organised and collated into one database or user interface, offering unprecedented

insight into an organisation, its functionality and its performance. This level of oversight could not be possible without the digital, communicative technology that we now use in all aspects of our daily lives, and the capabilities will only expand as Industry 4.0, cloud computing and the Industrial Internet of Things become more prevalent.

Harnessing digital technology to enhance asset performance

If we understand ERP as an umbrella term for modern asset management structures, we can then evaluate the different capabilities and requirements that exist within its remit.

Data is the key to unlocking asset management in the digital age. It is how data is collected, stored, managed and analysed that dictates the success of asset management from company to company. While there is not enough room here to look at how data can be collated from department to department, there are three aspects of asset management at a manufacturing level that provide indispensable information for manufacturers of any sector.

Condition monitoring of vital equipment

Condition monitoring essentially informs an asset management strategy by improving a business's understanding of its assets, how they are functioning, and whether or not they are detrimental to productivity in the long, medium or short-term.

Condition monitoring is more than sticking a sensor on a machine, however. It's a consistent evaluation of machine performance across areas that may not



have been considered at first glance. Even variations in vibration, temperature or noise can provide valuable insight into what is, or is not, functioning as it should.

Data logging and analysis of a conveyor, for example, could reveal a pattern of behaviour, wherein the conveyor slows down periodically. In examining the problem further, a maintenance engineer may discover that the component presumed to be the cause of the problem has actually functioned correctly, and it is another component that keeps failing.

Basing decisions on information such as this can help to inform a spares strategy that balances a healthy supply of stock, with budgetary control.



Using data to build a spares strategy

Equipment used on the factory floor will require spare – or back-up – components, to minimise downtime and make sure that any faults or breakdowns are dealt with quickly and efficiently.

Without an informed spares strategy, businesses are left with one of two options: either they stock everything they could possibly need, or they make reactive purchasing decisions based on the needs of the moment. Neither of these are ideal. The first, because it places constraints on budgets, space and staff. The second, because it relies on stock being readily available from third-party suppliers, without factoring in issues such as obsolescence or delivery.

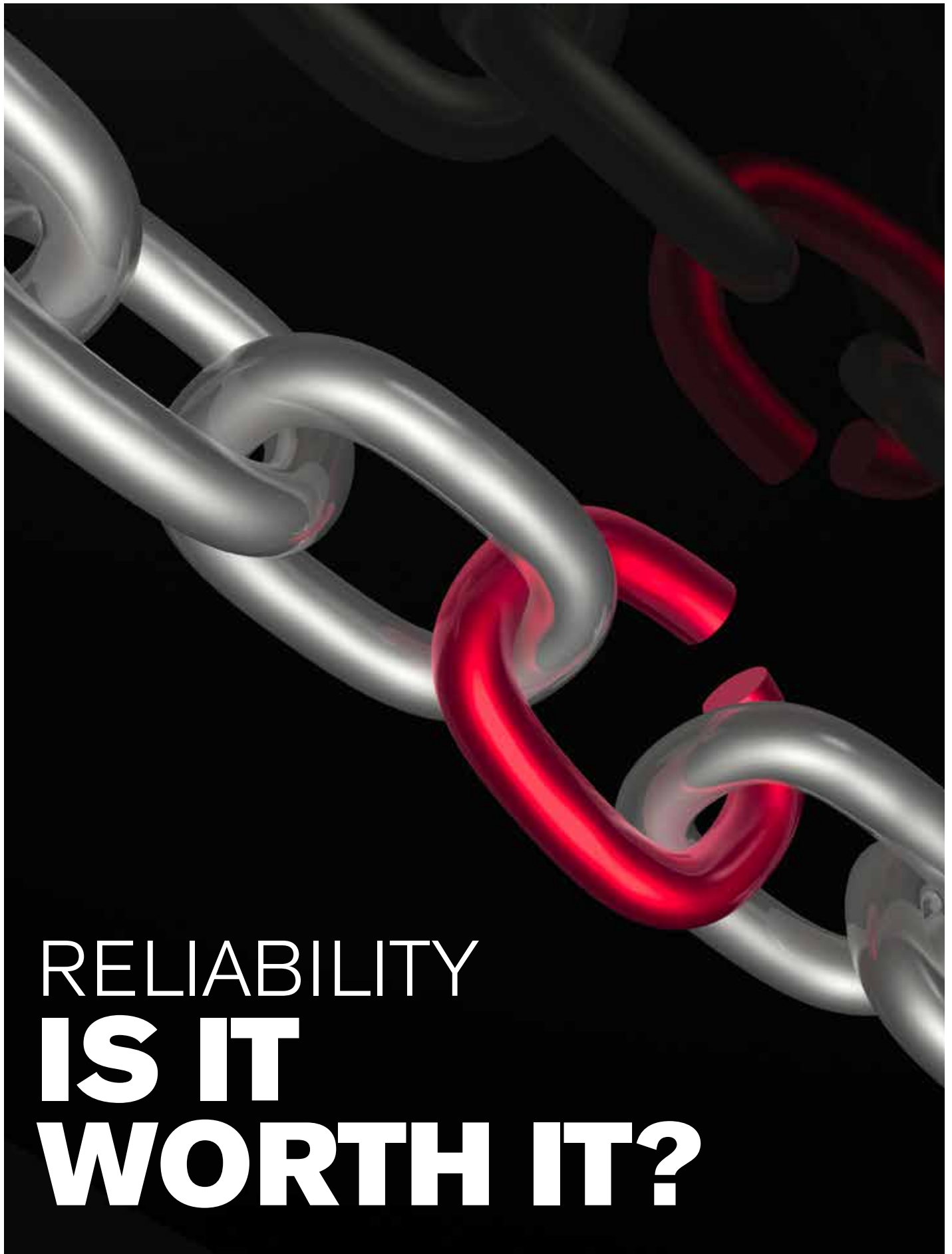
Due to the level of insight provided by condition monitoring data, for example, businesses can identify critical components that are most likely to fail, as well as key components that are difficult to source, which will then be prioritised for purchase. Once in the store room, a database can collate all the spares available, monitoring life expectancy, condition and rotation to ensure that spares are maintained in a production-ready condition.

From insight to foresight

Perhaps the most exciting trend in asset management is the ability, not only to monitor, but to predict which assets will be needed, and when. This is made possible by the level of data to which we now have access, which helps us to identify patterns, changes and warning signs before they become a problem.

The impact this could have on a business should not be underestimated. Not only does this allow organisations to stay one step ahead of their assets at all times, but it also reduces the likelihood of downtime, damage or loss of production. It is this capability that will define the proactive, rather than reactive, asset management strategies of the future. Data, digital and Industry 4.0 will all make this possible.

Many manufacturers may be concerned that such capabilities extend beyond the remit of their business. ERIKS offers a first-class service in asset management development and implementation, using the latest tools and techniques to achieve maximum value. To find out more, or to arrange a consultation, please visit the asset management page on the services section of our website.



RELIABILITY
**IS IT
WORTH IT?**



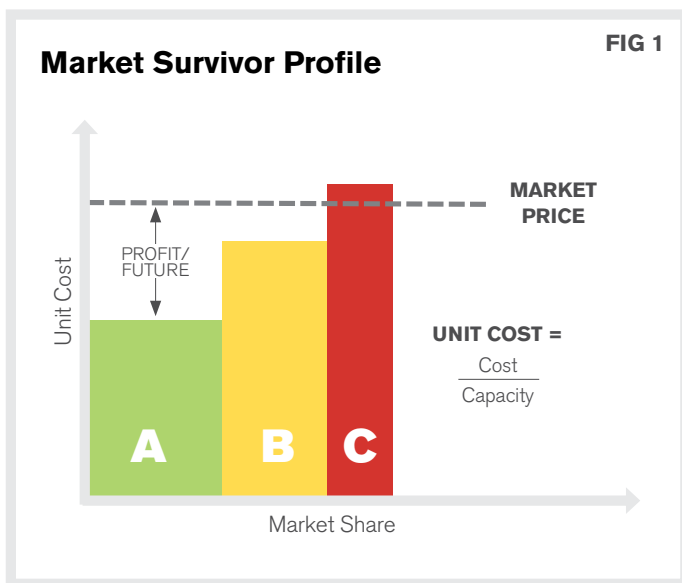
Andrew Fraser
Managing Director
Reliable Manufacturing

If plant and process reliability is an area of interest for you but you're not sure if you can afford the time or the investment to make a significant impact on performance, I hope in this article to show you that it is worth the effort.

If your company places significant emphasis on achieving excellence in safety performance I would go even further and assert that you must give reliability the same level of strategic emphasis as safety due to the integral relationship between the two. But more of that later.

Profitability and Survival

Most of us operate in a competitive environment where only the fittest survive or thrive. This is illustrated in *Figure 1* which shows three companies all competing in the same market, producing the same product. Each company has a different share of the market and produce their products for different unit costs e.g. pounds per tonne. The market price varies up and down depending on supply and demand but over time for most products it tends to trend downwards.



For example, if you were to buy a laptop today, it would cost you less than if you had been able to buy the same laptop 2 years ago.

The difference between market price and the unit cost is the gross profit. This pays for sales, marketing, new projects etc. I like to think of this as simply our future. If we can't do much about market price but we want to create a better future for ourselves, our only option is to reduce our unit costs of production. So far, so good.

Unit Cost is simply our manufacturing costs divided by our capacity or throughput. The significance of reliability is that it can impact both the top and bottom lines simultaneously.

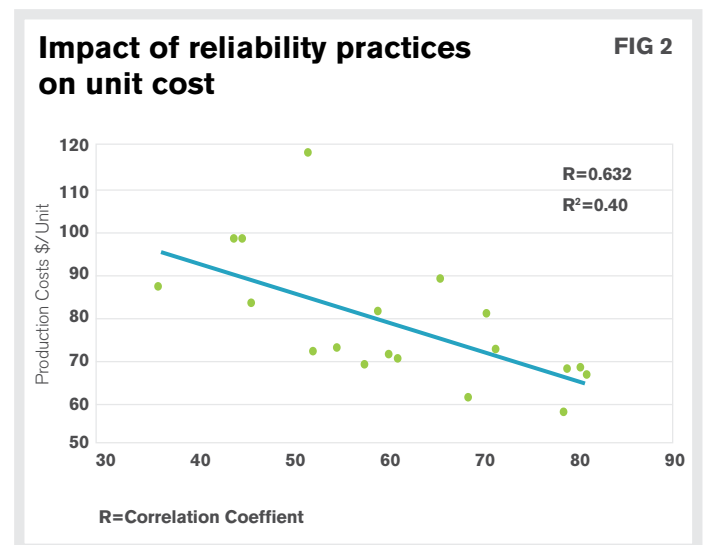
Let's say we fully embrace reliability over the next several years and we make a significant reduction in "unplanned failures", what does that do to our capacity our ability to produce? It goes up. What happens to our maintenance costs because we are not fixing equipment all the time in the most expensive way known to mankind

– wait till it breaks, probably at a most inconvenient time, then try to figure out how to fix it as quickly as possible – they go down. What happens to energy costs because we are not cycling our plants up and down as much – they go down.

“GIVE RELIABILITY THE SAME LEVEL OF STRATEGIC IMPORTANCE AS SAFETY...”

And what about quality and yield, do you think that they might just improve as a consequence because there are less stops and starts, less out of specification product? Just about every key performance indicator I can think about – output, quality, yield, costs, teamwork, morale, reputation gets better through reliability, when we truly establish reliability as a core business value.

So much for the theory. *Figure 2* is a case study of a company with 19 plants around the world. It shows the unit cost for each plant v's a "reliability Index". The "reliability index" is made up of 650 specific reliability practices and behaviours. The more of these practices and behaviours that each plant had demonstrated they had implemented, the higher the "reliability index score". Can you see the connection here between plant reliability and unit cost?



By the way, one of these plants didn't make it through the 2008 recession. I'll leave it to you to guess which one that might be!! You find out how really fit you are when recessions come around!

Reliability and Safety

As indicated earlier, if your organisation has safety performance as a core driver, then you have an even greater reason to pursue high reliability performance. Several companies have studied the impact of reliability on their safety performance.

Figure 3 is from a \$10 billion-dollar company showing the relationship they found between injury rate in red and asset utilisation rate (AU) in blue (a reflection of their underlying reliability) over a 5-year period. Notice the two periods where injury rate increased as AU dropped and the long period of declining injury rate with improving AU rate.

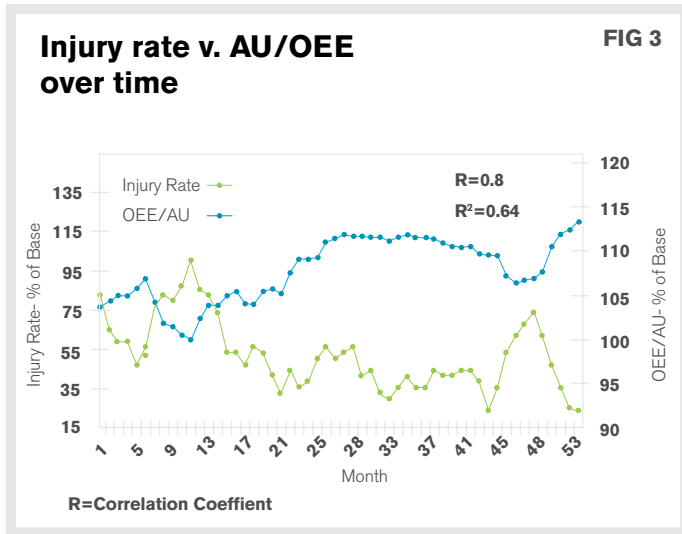
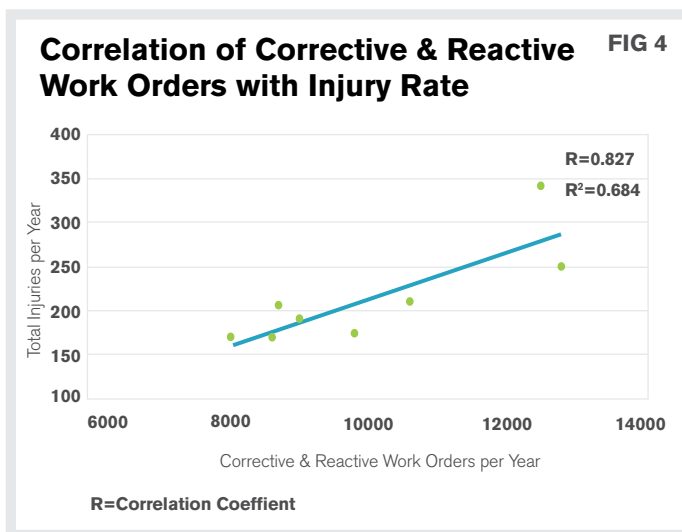


Figure 4 is from a large chemical company over an 8-year period showing total injuries per year (including first aid injuries) as a function of the level of corrective & reactive work orders for each year. (Incidentally I would define reactive work as any work done today that you didn't expect to do at least one week ago.) As their reliability improved, the level of reactive work orders declined as did the total number of injuries.



Other Companies have reported similar relationships from studying the effects of reliability improvement on safety performance.

The message here I think is quite compelling and has serious implications for us: If you believe in zero injuries or at least believe in doing all you can to prevent injury to people, then establishing reliability as a core value in your organisation alongside safety is essential, because if we continue to tolerate unplanned failures, we are inevitably exposing our people to greater risk of injury.

“EVERY KEY PERFORMANCE INDICATOR GETS BETTER THROUGH RELIABILITY...”

Surprising Results

Companies that pursue high reliability performance as an ethos also benefit from seeing surprising results from their efforts. One of our clients improved the reliability of a finished product milling operation. The driver for the improvement was purely to reduce the frustrations that the operators were experiencing due to the frequency of breakdowns. Not long after the improvements had been made the quality department started to ask questions of the plant, for a change not negative but positive in nature. They had seen a sudden, unexpected but welcome improvement in the consistency of a key product, which was eventually linked directly to a reduction in the number of mill stops and starts.

Conclusions

In this article I have tried to demonstrate how different aspects of business performance are integrally linked to plant, equipment and process reliability. Creating a high reliability performance culture is not just worth the effort, it is essential to delivering the many strategic performance areas we already care about.

A RELIABLE PLANT IS A SAFE PLANT IS A COST EFFECTIVE PLANT

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JUST MANAGING OR ASSET MANAGEMENT



Andy Cruse
Technical Director
Flow Control
ERIKS UK & Ireland

Just managing is reacting to problems. Asset Management is anticipating them. Just managing is allowing assets to lose efficiency.

Asset Management is maintaining them at their optimum. Just managing is tolerating downtime. Asset Management is improving uptime. Asset Management is not hard. In fact, any business can manage to do it.

A dictionary definition of Asset Management" is "the systematic process of deployment, operation, maintenance, upgrading and disposal of assets in a cost-effective manner." In short: asset care from cradle to grave. Which makes ERIKS' Asset Management the "National Asset Health Service".

However it's defined, the ideal outcomes of successful Asset Management are the same:

- reduced spend
- improved quality / reliability
- accurate budgeting
- reduced vendor base
- capital released from stores
- reduced administration
- minimised unexpected costs.

Pay less or manage more?

All too often, a great deal of time and effort goes into finding the asset with the lowest capital cost, believing that all money saved is good. But regardless of cost, if an asset isn't carefully managed you can waste more money than you saved.

Take a pump as an example. The capital cost represents only 5% of the Total Cost of Ownership (TCO). Maintenance costs represent another 8%. Yet energy costs account for 87%.

So a pump running inefficiently due to poor maintenance will see significantly increased energy costs and a major effect on TCO. A repairer may rectify the issue, increase the pump's efficiency and deliver energy savings of 10-15%. However, a partnership with an all-round industrial products and services provider such as ERIKS could prove far more profitable.

"ASSET MANAGEMENT IS NOT HARD. ANY BUSINESS CAN MANAGE IT..."

With ERIKS' know-how applied not just to the pump but to the complete pumping system, you could expect to achieve energy savings of 30-40%. And with a full, proactive, ERIKS Asset Management service, you can expect to see those savings sooner rather than later.

"But if it ain't broke," you might say, "don't fix it."

The risk is, when it does break it could affect production. A line may have to be halted, or the complete plant shut down, simply due to one failed asset. Depending on what the asset is, and its role in your



process, you may even be producing faulty or contaminated products, or risking health and safety.

As the risks and costs mount up, the cost of maintenance and repair is insignificant in comparison. In fact, the energy savings will easily finance the early intervention.

So even if it ain't broke, don't risk it.

Are your assets in control?

Asset Management makes the difference between you or your assets being in control.

If your assets control you, you're reacting to issues as they arise, and paying the price in lower efficiency, lost production and emergency call-out fees. If you control your assets through Asset Management, you can be proactive and reap the rewards in higher efficiency, more uptime and lower maintenance costs.

Taking back control of your assets with ERIKS starts with a plant walk-round with an ERIKS engineer, to ensure we understand your challenges. That's followed by a thorough audit of your assets, to answer vital questions such as:

- How many different manufacturers' equipment do you have in your plant?
- How many different models?
- How many spare parts?
- Which assets
 - are obsolete / being phased out?
 - no longer perform to spec. or conform to legislation?
 - are vulnerable to failure / about to fail?
 - are process-critical?
- Does your spares stock profile match your needs?
- Does your procurement process match the models you operate?

Once a complete picture of your assets, their condition, their criticality, reliability, energy use and spares profile has been established, ERIKS can help you to undertake Asset Management Best Practices, including:

- a spares maintenance programme
- process mapping
- training
- lubrication routines
- turnkey upgrades / new installations
- consolidated spare parts supply
- asset tagging and tracking
- reverse engineering
- inventory optimisation.

With a recommended spares, inventory and obsolescence policy in place you'll see reduced costs and reduced business risk. By undertaking preventative and predictive maintenance you'll see an increase in Mean Time Between Failures, with increased productivity and lower operating costs. Your environmental and process safety performance will be enhanced, ensuring legal compliance. And with documented testing, inspection and certification of asset governance, you'll ensure regulatory compliance too.

Or to put it simply: you won't be just managing. You'll be Asset Managing.

ERIKS IN ACTION

WASTING MONEY ON WASTE WATER

A customer was noticing frequent clogging and blockages of their waste water pumps. These were causing catastrophic failures, as well as high energy use and an increased risk of pollution and environmental contamination.

Whereas previous suppliers had simply carried out repeated repairs – just managing rather than Asset Managing – ERIKS conducted a pumping station system assessment. This revealed that the pumps were not only failing to operate at peak efficiency, but were also failing to pump at the required flow rate: making them non-compliant with Environment Agency regulations.

ERIKS' solution was to specify new pumps with greater reliability and a higher flow rate. The increased velocity prevented blockages, guaranteed compliance, and meant they required less operating time – thus reducing energy consumption.

The energy savings alone helped recoup the cost of the new pumps, even before the savings on repeat maintenance and repairs were taken into account.



Andy Cruse
Technical Director
Flow Control
ERIKS UK & Ireland

Most of your maintenance and repair problems, and therefore most of your maintenance and repair costs, arise from a few areas of your plant. So the key to minimising downtime and reducing your total cost of ownership is to identify those areas, anticipate the problems, and have a plan in place to deal with them proactively. In other words, you need to pick your fights.

Too many plants operate on a reactive basis. An asset fails, there's a rush to fix it quickly (only possible if you have the spares in store) and then it's on to the next crisis.

“THINK AHEAD, THINK MORE DEEPLY, ACT ACCORDINGLY...”

Some plants think a little bit more ahead. If they have downtime planned – perhaps for an annual shutdown – they will schedule an asset overhaul accordingly. But that's irrespective of whether or not the asset actually needs an overhaul at that time. It's also important to realise that even a



Oi!

YOU LOOKING FOR A FIGHT?

complete overhaul will not restore an asset to as-new condition. As a result, the Mean Time Between Failure on sequence repairs will decrease over time, until it is no longer cost-effective to maintain the asset.

Let's be smarter

Planned Preventative Maintenance lets you be smarter about how you spend your M & R budget, by helping you to think ahead, think more deeply, and act accordingly. It gives you foresight, and insight.

Foresight is knowledge of what's going to happen with your asset, and being prepared. Insight is a deeper understanding of how, when and why it's going to happen, so you can prepare even more thoroughly.

So if you're going to pick a fight, foresight says you should prepare your defences first.

In M & R terms, that means getting your spares strategy in place, with the parts in store that you're most likely to need. That could be the parts most likely to fail, critical parts, or components with long lead times. Defences in place, it's time to attack the problem – with a Condition Monitoring regime that gives you the insight you need to target your resources most effectively.

Watch and learn

The more you watch your assets, the more you can learn about how they perform and how and when they're likely to fail.

Condition Monitoring provides a snapshot of asset performance. For example, a bearing which is failing over time will show up in regular vibration monitoring and may show a gradual trend if regular readings are taken. However some components – a mechanical seal on a pump, for example – can fail catastrophically with no warning at all. That's why continuous Condition Monitoring is even more effective.

Continuous monitoring not only enables you to set a benchmark for a new asset with your first vibration reading, but also provides far more reliable trending information. Comparison with the benchmark readings will indicate if something is wearing or failing, and any change in status can be immediately spotted, investigated and rectified before it leads to a breakdown, critical failure, or downtime.

But don't forget, to ensure a true indication of asset condition and trending, a new benchmark needs to be established after any and every repair or overhaul.

If it ain't broke...

...don't fix it is not the best way to organise a maintenance regime – because the other side of the coin is “don't fix it until it breaks.” And that's when you're continually repairing rather than maintaining, reacting rather than acting, and risking lengthy production downtime with every component that fails. It's a recipe for inefficiency and a higher total cost of ownership.

Applying foresight is an improvement. It means you are planning ahead, maintaining rather than repairing, and being more prepared for when a failure occurs.

“PREPARE YOUR DEFENCES FIRST, INSIGHT SHOULD BE YOUR AIM...”

Insight should be your aim. It informs foresight by helping you understand asset criticality so you can pick your fights. It helps you to be smarter by enabling you to plan interventions. And by showing you how and when assets fail, it ensures you are ready to act quickly and effectively, to minimise downtime, get production back up and running, and dramatically reduce your total cost of ownership.

So if you're going to pick a fight, make sure you're going to win it.

GOING SPARE WITHOUT A STRATEGY



Andy Cruse
Technical Director
Flow Control
ERIKS UK & Ireland

Having spares available for your rotating equipment is only half the story.

To reduce maintenance costs and downtime, you also need a spares strategy.

Reliability and maintenance costs are two key drivers of the unit cost of production. According to a study by Solomon Associates¹ these should be targeted at 96% availability, with a maintenance cost of 1.4% of the plant replacement value.

A spares strategy for your rotating equipment, which identifies spares criticality and rationalises your engineering stores, is one way to achieve these targets. And it can even improve your Total Cost of Ownership.

“AN EFFECTIVE SPARES STRATEGY SHOULD DO MORE THAN KEEP YOUR ASSETS RUNNING...”

All spares are not created equal

Are your engineering stores a pick and mix of spares for your rotating equipment, or an accurate reflection of the assets in your plant? Shelves filled with spares which are hardly ever needed aren't a production resource but a waste of space. Especially if you lack enough of the critical spares which keep your plant running.

So clearly, your first step towards optimising plant availability should be to identify critical spares and their lead time for replacement. If you have only one standby replacement for a critical asset, and it has a six week lead time, for example, once you remove the asset from your stores you're exposed to six weeks' risk of a plant shutdown.

But that doesn't mean you need a standby asset for your standby asset.

With the right experience and know-how applied to the task, you'll know whether it's possible, quicker and more cost-effective to repair, refurbish or replace. Knowledge of how equipment fails can also help you to maintain a stock of critical components (seals kit, bearings etc.) for critical assets. If your spares requirement is expertly assessed and carefully planned, the right components can provide the same risk mitigation as holding a replacement asset – but far more cost-effectively.

Source: Solomon Associates, 2013 Solomon RAM Study

Longer, healthier life

An effective spares strategy should do more than help you keep your assets running. It should also help you keep them running more efficiently for longer. The equipment, industry and market knowledge and experience which ERIKS can bring to your spares strategy can do just that.

An ERIKS criticality assessment will not only identify which assets and spares are “plant stoppers”, but will also highlight equipment failure modes, to help with spares selection. After all, there's no point in stocking a spare bearing if ERIKS' experience shows it's typically the seal that fails.

Better still, ERIKS' spares knowledge means that if there's a suitable seal out there which fails less frequently, we'll know. And if there are two assets on your site which use the same seal, ERIKS will know that too: so you can avoid spares duplication and reduce your inventory.

By devising a lean but focussed spares strategy for your rotating assets, ERIKS can help you to hit the “sweet spot” between too few spares – preventing you from reaching that 96% availability target – and too many: which would increase your maintenance costs beyond the target of 1.4% of plant replacement value.

Storing-up trouble?

Even with the right spares strategy and inventory in place, you can't forget about your spares until you need them. Just like assets on the plant floor, spares need maintenance.

Rotating parts in particular are susceptible to false brenelling if left in one position for too long, and should be rotated on a regular basis. Some component parts within rotating equipment also have a shelf life. An O-ring or seal, for example, will need replacing after 6-8 years, even if built-in to the asset.

“AVOID SPARES DUPLICATION AND REDUCE YOUR INVENTORY...”

So why not talk to ERIKS about your spares strategy and stores management? It will improve your asset reliability, lengthen asset life, improve your TCO – and mean all sorts of problems spared.

ERIKS IN ACTION

1.5 TIMES BETTER

ERIKS' review of 359 pump assets for a major global beverage manufacturer revealed that an asset management strategy would reduce their TCO and increase uptime.

ERIKS identified criticality, spares coverage and spares shortfall, highlighted high-risk areas, and proposed a rationalised spares stock to mitigate risk. Along with spares standardisation, and some pump specification changes to increase energy efficiency, the strategy improved MTBF to 1.5% above the industry target (90 months versus 60 months).

Spares costs were also reduced, unplanned downtime minimised, and plant availability optimised.



MAKING SENSE OF SENSORS



Mark Jackson
Project Engineer
Power Transmission
ERIKS UK & Ireland

Sensors are everywhere from your Fitbit to your iPhone, and coming soon to a driverless car near you. Yet in a reversal of the usual order, it's consumers who are benefiting first from the technological developments, while industry lags behind. Not for long.

Many of us are already experiencing what sensors can do in our everyday lives. So expectations are high for what they can do for industry. But it's important to realise they're not the universal answer to every equipment monitoring problem. As with any tool, it's not the tool itself but how it's used that's important.

Even though sensors are less costly than they were, you still need to know:

- what you want monitoring to tell you
- what you need to monitor
- what to do with the data you collect and
- how to interpret the data.

Otherwise you can still spend – and waste – an awful lot of money.

Connected thinking

Sensors' basic design has not changed significantly for many years. However there has been a revolution in their signal processing and data transmission capabilities. And it's their capability for wire-free connectivity which is really creating new possibilities for industry.

Now that it's possible to connect things which couldn't previously be connected, OEMs are seeing the advantages of open networking. Whereas once, for example, DeviceNet wouldn't talk to PROFINET, there are now protocol converters available to ensure it will.

The benefits for customers of an holistic view of their assets on a single dashboard are obvious. Yet more sensors and more connectivity does bring a new challenge.

“EXPECTATIONS ARE HIGH FOR WHAT SENSORS CAN DO FOR INDUSTRY...”



What to do with data?

The number of sensors and the amount of data they produce are both increasing exponentially. In fact the upper limit of IPV4 addresses has almost been reached, prompting an imminent move to IPV6 simply to accommodate all the things being connected. A change in the way the data they produce is dealt with is also required.

Industry generally sends data to the cloud for storage and analysis. This means vast amounts of digital information being transferred off-site, and vast amounts of processing power being required to sift out what's relevant from what isn't.

One solution being adopted is to support cloud computing with local "fog computing".

IoT-connected sensors on assets send all the data they collect to on-site fog nodes. These nodes then process the data locally, and periodically send only relevant information to the cloud for analysis. Once the data has been analysed, the cloud can rewrite application rules accordingly and send these back to the fog nodes, from where they can be uploaded to the assets to update the way they operate.

The result is equipment which is always operating at optimum efficiency, with improved running costs and productivity, and a reduced total cost of ownership.



Beyond the basics

Even with fog computing, the use of sensors within industry is still at a fairly basic level. They mainly facilitate condition monitoring, which in turn enables preventative maintenance. However, combining sensors with the IoT offers the potential to do much more.

For example, it should be possible to identify a change in a monitored parameter against the benchmark, to interrogate the asset to discover the cause of the fault, and to automatically call the engineer. Thanks to the information provided in advance, the engineer will arrive with the correct part or parts, for a quicker and more effective repair or replacement.

It doesn't happen yet, but it will do. And if the skills shortage in industry continues, it could even go a step further.

“CONNECT THINGS WHICH COULDN'T
PREVIOUSLY BE CONNECTED...”

The Augmented Reality engineer

When a sensor flags up an issue in the future, it won't necessarily bring an engineer rushing to the site. Instead, an operator might just put on his glasses. But these won't be just any glasses.

Point-of-view telepresence glasses are fitted with an HD video camera and connected to the internet, so that a remote engineer

can see what the person on-site sees. They also have a stills camera, so a picture of the failed component's part number can be sent to the engineer. He or she can then send back a schematic of the part to a heads-up display, and talk the person on the ground through the repair or replacement process.

Using this type of Augmented Reality (AR) device, an experienced engineer could potentially analyse and direct the repair of several faults in different locations all in one day. It's more efficient and more productive, reduces asset downtime, and enables less-skilled staff to carry out skilled engineering tasks, whilst learning on the job.

Open to the future

ERIKS UK is already working with ERIKS Netherlands to develop AR smart eyewear. And while OEMs are just getting to grips with the new world of openness and connectivity, ERIKS has always been open to working with all manufacturers, across a vast range of products.

What counts for ERIKS is resolving the customer's issue, optimising equipment efficiency, and minimising the total cost of ownership.

As sensor technology develops beyond traditional vibration and temperature monitoring, it will soon be possible to gather and analyse data on almost any aspect of any asset's condition, and to adjust its operation accordingly, in real time. And the only human intervention required will be to talk to ERIKS first.

Reduce the
**TOTAL COST
OF OWNERSHIP**
of all your hose
assets

THE LEAKIEST LINK



Andrew Dawes
Product Manager
Hydraulics
ERIKS UK & Ireland



Mark Carpenter
Product Manager
Industrial Hose
ERIKS UK & Ireland

Hydraulic and industrial hose assemblies have traditionally been seen as commodity items. Even, in the case of hydraulic hose, as a do-it-yourself option using on-site crimpers. However increasing health and safety legislation, and a growing awareness of the criticality of hose in maintaining uptime, are leading more people to consider professional hose management solutions.

Hoses are an essential element in many processes. But their importance is often overlooked until there's a problem. And without an expert, proactive, preventative maintenance programme, those problems can be hard to spot until it's too late. Then at the best you're facing downtime, lost production, and emergency call-out costs. At the worst, you're facing employee injury.

Even as legislation becomes more restrictive, hose damage is becoming more common – often as a result of, for example, more aggressive cleaning processes for industrial hose within the Food and Pharmaceutical sectors. At the same time, the consequences of a damaged hose are becoming increasingly serious: not only in terms of personal injury and downtime, but

also product contamination, environmental impact or pollution and their associated compensation and clean-up costs.

To help customers keep processes running and keep employees and the environment protected, ERIKS is offering an Integrity Management Programme for Hydraulic Hose, and an Asset Management Solution for Industrial Hose.

“KEEP PROCESSES
RUNNING, AND EMPLOYEES
AND THE ENVIRONMENT
PROTECTED...”

Understanding industrial hoses inside out

One of the greatest challenges of hose inspection is that problems are just as likely to be on the inside as the outside. That's why an expert inspection using the latest endoscopic camera technology is such an important element of an effective preventative maintenance regime for industrial hose.



ERIKS' dedicated industrial hose testing teams offer a full on-site test and inspection service which checks for:

- external wear and abrasion
- tears to the internal liner
- partial blockages and deposits
- popcorning defects

In addition to visual checks, the industrial hose testing service includes pressure-checking with water or compressed air, pumped through the hoses at 1.5x their rated working pressure to detect any leaks. Hoses which pass inspection can then be certified by ERIKS to meet the relevant legislation, and industry standards such as FDA.

Hydraulic hose assemblies are inspected externally normally at the customer's premises, against manufactures performance criteria taking in account the actual working conditions, and ERIKS' accumulated hose life data and years of experience.

Colouring our judgement

When the tests are complete, the ERIKS teams apply a condition rating and tag to each hose.

Hoses which are good for continued use are rated green; those which require continued monitoring are rated amber. (It is recommended to have a replacement ordered and placed on standby.) Lastly, hydraulic hoses rated red need replacing at the next scheduled shutdown or an agreed time, while a red-rated industrial hose indicates immediate replacement.

By having your hose tested and categorised in this way, you are taking positive steps towards an effective proactive maintenance and asset management programme, which will reduce the Total Cost of Ownership (TCO) of all your hose assets.

Proactive, predictable, productive

With your hose data logged onto an online ERIKS Asset Register, you can benefit from a comprehensive asset management programme and regular inspection routine for all your hydraulic and industrial hose.

You can use the register to quickly identify when a hose was last inspected, to monitor performance, and to predict trends. The register can also be used to track how often a hose has been changed and the

reasons why. By flagging-up too-frequent replacement, this allows determination of the root cause, with a view to modifying the hose, installation or application as appropriate, to minimise lifetime costs.

Expert proactive monitoring and preventative maintenance from ERIKS' hose experts is available now, to reduce unplanned downtime and emergency call-out fees, ensure optimum uptime and productivity, and cut the total cost of ownership of all your hose assets. Meanwhile, a cloud-based hose management system for industrial and hydraulic hose is in the pilot phase of testing with an ERIKS global customer, with a view to further improving ERIKS' hose asset management capabilities and further reducing your hose TCO.

TAKING CONDITION MONITORING THERMOGRAPHY INTO **FORBIDDEN TERRITORY**



David Manning-Ohren
Business Development Manager
ERIKS UK and Ireland

You know that a thermography camera, in the hands of an experienced operator, is a powerful tool in the condition monitoring armoury. However, there's always a case for exploring new areas for its use, as an ERIKS conditioning monitoring technician recently proved.

On site at a pharmaceutical customer's premises for a regular thermographic survey, the technician found himself passing a compound secured by an 8' feet-high wire fence. Inside, an area the size of a basketball court contained the HV power lines bringing power onto the site. "Don't worry about surveying that," said the customer. "It's the power company's responsibility."

That was true. But if the power lines failed, it would be the customer's business that suffered. A quick calculation showed that a third of the plant would lose power, production would be severely affected, and hospitals could even be left short of essential treatment drugs.

The customer realised that a thermographic survey, at no extra cost, was well worth 45 minutes of the technician's time. And that was before they knew what they would find.

Failure's in the air

Using his camera's zoom lens, the ERIKS technician thermographically swept the whole area from outside the fence. What he saw made it clear that the survey wasn't wasted. The camera revealed a suspicious hotspot, indicating a loose connection.

The site is situated close to the Scottish west coast, exposed to a prevailing south-westerly wind. There is enough salt in the air to allow ionisation at the loose connection, leading to electrolysis forming copper chloride. As this is washed off by rain, the connection would become more corroded, until eventually it would catastrophically fail, and power to the site would be lost.

"A THERMOGRAPHIC
CAMERA DOES NOT MAKE
A THERMOGRAPHER..."

Armed with the images and report from the ERIKS' survey, the customer quickly contacted their energy provider, who sent out a team within days to repair the connection. But the story doesn't end there.

One month on...

The customer in question takes thermography seriously as a valuable condition monitoring tool.

ERIKS spend around 80 thermography days a year at the site: not only surveying for condition monitoring purposes, but also benchmarking for future surveys, and training and mentoring the customer's staff in the effective use of thermographic equipment.

A thermographic camera – however sophisticated – does not make a thermographer. Knowing where to point it and what the results mean are just as important as the equipment itself. ERIKS' broad experience of industrial assets, and understanding of how products fail, informs carefully targeted and highly effective thermographic surveys, and accurate interpretation of the images produced.

As part of the service, the ERIKS technician was back at the site a month later, to re-survey areas where issues had previously been identified, and to confirm that any actions taken had been successful. That

included checking the HV power line connection.

Second time lucky

Despite the repair, thermography revealed there was still a fault.

Once again the customer contacted their energy provider, and a team arrived next day. ERIKS' technician returned the day after and this time confirmed the problem was fixed.

The customer operates a "no-blame culture". Their concern was only to establish the root cause so the fault could be avoided in future. The important point was that both faults were identified and resolved, and the customer's site avoided any power loss or costly downtime.

Looking and seeing

Thermographically surveying an out-of-the-ordinary area proved highly effective for this particular customer. However ERIKS have many examples of technicians pointing the camera in the right direction at the right time to deliver unexpected benefits.

A leak of caustic soda from a large storage vessel, for example, was recently identified by thermography. The customer knew liquid was being lost, but not where, and had never considered a thermographic survey. An ERIKS technician passing the silo switched on his camera, and the leak was revealed.

A thermography technician who knows where to look, and knows what they're seeing, can help customers to save money, avoid downtime, and achieve the greatest efficiency from condition monitored assets. Even from some you might never have thought to thermographically survey.





**MANN+
HUMMEL**

Steve Brady
UK Sales Manager
Intelligent Air Solutions (IAS)

There's been a great deal of talk lately about the risk to health from traffic fumes. Unfortunately there's not much you can do about that when you're out and about. But the particulates which cause the problems are also found where you work. That's why you almost certainly have air filters installed within your industrial premises. The problem is, they may not be as effective as you hope.

For over 20 years air filters have been tested and classified according to EN779. If they're from a reputable manufacturer, the filters in your air handling units will have been made to meet this standard. However, given the information available about the health risks arising from particulate matter inhalation, this doesn't mean that your filters are up to the standard you may have hoped for. Are they supplying truly clean air?

“NEW ISO STANDARD COMING INTO FORCE...”

That's why a new ISO standard is coming into force within the next few months. And when you are specifying or upgrading air filters, it should help you breathe more easily.

The world catches up

The new ISO 16890 standard will help you find more effective filters for your application, because it's based on testing which replicates atmospheric conditions within the actual testing laboratory. This is an approach which Mann + Hummel has been promoting for many years.

Where the old standard (EN779:2012) concentrated on ensuring uniformity across filters – which at least served to drive up standards and simplify selection – it didn't allow for the fact that air is not uniform. Or at least the particulates it contains aren't. So the standard only tested a filter's ability to capture particulates of one size: 0.4µm. Yet there is a huge range of particulate sizes present in the air, and any of them below 2.5µm are small enough to sneak past the body's natural defences and enter the lungs.

GETTING PARTICULAR ABOUT PARTICULATES



The new ISO standard, on the other hand, uses a series of twelve tests to put filters through their paces with a variety of different-sized particulates – from 0.3µm all the way up to 10µm – just as they could face in your air-handling unit.

A Mann + Hummel eco16 survey is also based on real life conditions. And not in the lab but at your own facility. The survey measures and analyses the precise conditions at your site, so the exact filter specification best suited to the local environment can be selected.

Using the patented eco16 survey and filter selection programme, you can be sure of receiving a Mann + Hummel filter which guarantees a set level of air quality at the lowest possible cost of ownership.

Choose your air

The new ISO standard, launched in early 2017 with an 18-month transition period, makes it easier for you to choose the filter that delivers the quality of air you want to breathe.

“TESTING REPLICATES REAL LIFE...”

The Standard defines four new filter groups: Coarse, ePM10, ePM2.5 and ePM1 (“e” simply stands for “efficiency” and “PM” for “Particulate Matter”). To fit into a group, the filter must capture at least 50% of the particulates in that size range. Filters which capture less than 50% of PM10 particulates go into the Coarse group.

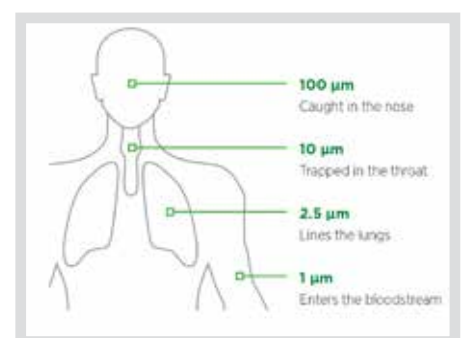
Mann + Hummel recommend that you use the World Health Organisation’s safe level figures as the baseline for your own filter choices. These prescribe the recommended level for indoor air quality as being PM10 at 20µg/m³ and PM2.5 at 10µg/m³. There is currently no set guideline for PM1 levels so you should set the air quality level according to the needs of the particular application. PM1 is the most harmful of particle sizes, so when it comes to health we recommend a minimum of an ePM1 50% filter within the majority of applications.

“AIR QUALITY AT THE LOWEST POSSIBLE COST OF OWNERSHIP...”

It’s easy to find the PM levels in your local area by searching on the internet. You can then use the information to work out the level of filtration you need to achieve safe particulate levels in your building, as in the example below.

Then you can talk to ERIKS about choosing the right Mann + Hummel replacement filter to upgrade your air handling unit and upgrade your air quality.

Incoming air	Reduction Required	Desired air quality
PM10: 48µg/m ³	58% Min Filter ePM10	PM10: 20µg/m ³
PM2.5: 33µg/m ³	69% Min Filter ePM2.5	PM2.5: 10µg/m ³
	70%	



A THREE-TIERED APPROACH TO CONDITION-BASED ASSET CARE



Karl Dalton
Business Development Manager
SKF UK

SKF Certified Maintenance Partner, ERIKS can link your predictive maintenance programme to SKF's vast experience and knowledge of machinery optimisation. In this article we discover how your condition-based asset care strategy can be tailored to meet all budgets and operational needs by following SKF's three tiered approach.

Condition-based and predictive maintenance strategies are widely implemented throughout industry and the level of sophistication of the types of systems deployed will invariably depend upon budgets, asset criticality and resources. As the exclusive UK-based SKF Certified Maintenance Partner, ERIKS can provide services that include a preliminary assessment of your machines; the development of a database of machine related parameters; the deployment of appropriate data collection and analysis technologies, and the provision of recommendations on specific actions to avoid unplanned downtime and extend machine life.

More recently, this service offering has been further enhanced by embracing a novel approach from SKF that proposes a staged approach to condition-based asset care. This three-tiered strategy allows users to adopt one or more of three levels of condition based asset care – basic, better or best – dependent upon budgetary

constraints and/or the criticality of individual assets. Let's take a look at each of these in turn.

Basic asset care

The simplest monitoring tools include portable, handheld devices or permanently installed sensors capable of measuring changes in vibration or changes in operating temperatures in both mechanical and electrical systems. To help simplify machine maintenance and prevent costly failures, a variety of basic handheld devices from SKF are available, that in-house maintenance technicians can use while carrying out a routine walk-through machine data collection task. The latest of these is SKF QuickCollect, which monitors both vibration and temperature, transmitting this data wirelessly to a mobile device, where an entry-level app called SKF QuickCollect is used to provide machine diagnostics and analysis.

Where continuous vibration and temperature monitoring of non-critical machinery is desired, the permanently installed SKF Machine Condition Indicator is equipped with LEDs that illuminate when pre-set thresholds have been exceeded to warn operators that further investigation is needed. Internal sensors measure velocity, enveloped acceleration (bearing or gear impulsive vibration) and machine surface temperature.



Better asset care

Operators work in close proximity to equipment, so they are usually the first to detect even the slightest changes in process conditions and machinery health. However, their observations often go unreported, or are not effectively acted upon, leading to machine failures, unplanned downtime and higher operating costs. Here, clients can make use of an SKF solution called the Operator Driven Reliability (ODR) programme, which enables this valuable source of machine health data to be easily collected, analysed and acted upon.

SKF QuickCollect is a good example of this process in action. More experienced operators can make use of a second app for this platform called SKF DataCollect. This is an ISO standard compliant maintenance and inspections program that extends the

“AVOID UNPLANNED DOWNTIME AND EXTEND MACHINE LIFE...”



diagnostic capabilities of SKF QuickCollect, allowing trained and mentored users to manage and monitor their maintenance tasks and inspection data, as well as giving them the ability to register for, and connect to, the SKF Cloud for access to SKF's and ERIKS' remote expert services.

Best asset care

SKF's best level of condition-based asset care is the final option when handheld or periodic data collection instruments are deemed inappropriate for reasons of plant safety, asset value, or the critical nature of the processes and machines being monitored and so on. In this case, it is strategically and tactically beneficial to take your asset and machine health monitoring programme wholly online for expert analysis and recommendation.

The monitoring tool for the experienced user is the recently launched SKF Multilog On-line System IMx-8, a compact 8-channel version of its popular IMx machine health monitoring platform. This versatile, more compact system brings affordable machine health monitoring to a much wider industrial user base and even includes a useful Event Capture feature, which is of particular appeal to machine tool users requiring a cost-effective crash detection capability.

SKF's three-level approach to condition-based maintenance serves a variety of circumstances and machine criticalities. Choose a level suited to your needs and you will be able to operate your assets more dependably, affordably, productively and profitably.



DON'T JUST REACT: ACT!



FESTO

Richard Causley
Relationship Development Manager

Reactive maintenance is a policy that's been made to sound respectable by giving it a professional sounding name.

But when you consider that it's essentially waiting until something goes wrong, then running round panicking until it's fixed, it doesn't sound quite such a good way to operate.

When the failure in question is something as simple as the ink running out in a labeller, it's not necessarily such a problem to fix it. Even so, the resulting stoppage can cause significant impacts on costs, productivity and reputation. In food manufacturing for example, the consequences of an unplanned stoppage can lead to entire product batches being spoiled, which in turn means missed delivery targets and potentially punitive penalties – in addition to an eroding of trust between supplier and customer.

“AN UNPLANNED STOPPAGE CAN LEAD TO ENTIRE PRODUCT BATCHES BEING SPOILED...”

However, increasing digitalisation is now driving changes for the better in industry's approach to maintenance.

One outcome is the evolution of condition monitoring, which enables more predictive maintenance. Or in other words, it allows engineers – instead of just reacting – to act in advance to prevent a fault becoming critical and affecting production. Data about the product, the environment, and wear and tear help to indicate when and where faults are developing, so:

- issues can be anticipated
- maintenance outages can be better timed
- causes of unplanned stoppages can be avoided altogether.

It has been known for many years that using prevention rather than cure in a maintenance regime results in real time and cost benefits. Now further advances in automation have the potential to evolve this approach for even greater returns.

Service life characteristics

One way that prevention is proving to increase efficiency, reduce downtime and ensure safe-running machinery is demonstrated by Festo's identification of product service life characteristics.

All product series which leave Festo's factory are subjected to comprehensive functional and endurance tests, in the development phase and during most phases of the product lifecycle. They allow us to continuously optimise our products, so they offer a longer service life, greater economic efficiency and higher reliability.

An understanding of the service life of a product is important for preventative maintenance. Service life specifications are based on the technology, and for products subject to mechanical wear are indicated in the form of switching cycles or running performance. For electronic products, they



are in the form of operating hours or years. All types of service life specifications are used at Festo, regardless of whether they apply to mechanical, pneumatic or electronic components.

“UNDERSTANDING THE PRODUCT’S SERVICE LIFE IS IMPORTANT FOR PREVENTATIVE MAINTENANCE...”

Plant modernisation

Another approach to reducing maintenance, extending plant service life and increasing productivity is plant modernisation.

A successful plant modernisation can be all that’s required to transform an old, used plant into one that’s (nearly) new

and innovative. This can be achieved by, for example, incorporating functions that the unmodernised plant could not have fulfilled – such as sensor technology for condition monitoring, diagnostics and preventive maintenance; the introduction of energy efficiency; or updated pneumatic and electrical components. Modernisation is the solution that combines innovation and increased productivity.

If the plant is required to remain operational, retrofit could be the way to proceed. However individual components may no longer be classed as state-of-the-art, may no longer be energy-efficient, or their reliability may be compromised.

Know your production line

Having a thorough understanding of your production line cycles, and components within the line, allows you to implement an intelligent preventative maintenance program that will lead to:

- reduced costs
- modernised production processes
- lower power consumption
- extended service life
- reduced downtime
- improved production quality
- enhanced safety for employees, machines and the environment
- long-term continuous supply of spare parts.

For more useful tips and information on product service life, make sure you download the Product Service Life document from Festo, at www.festo.co.uk/psl

WHEN IT ALL COMES BACK TO THE **BEARING**



MOTION & CONTROL
NSK

Robert Bryan
After Sales Manager

Lost production, unplanned maintenance, lubricant disposal, asset devaluation, and potential health and safety issues. Sometimes, these problems and their associated costs can all be traced back to one cause: bearing failure.

The NSK Added Value Asset Improvement Programme (AIP), can help you to choose the right bearing with the right specification, to minimise bearing failure, optimise productivity, and reduce costs.

Identifying an efficient bearing solution is complex. It needs expert knowledge, experience, and a carefully planned approach to ensure increased productivity of machines and plant. The NSK AIP Value Cycle is a standardised, tried, tested and proven process, based on best practice and easily applied to your applications and processes.

An eye for detail

Sometimes problems can go undetected for years: driving up costs and reducing profitability. Identifying the factors that contribute to high production costs takes an expert eye for detail.

NSK experts look at your manufacturing process and choice of bearings, to assess the areas likely to offer you the best returns. This Process Mapping approach – targeted at your production line, stores, or workshop environment – will produce a comprehensive review highlighting opportunities for improvement.

Based on the plant and machine condition data collected, NSK can recommend the optimum bearing solution for you. They can also provide information on machine component design, available part numbers and running conditions. This type of Application Review can support machinery upgrading or redesign, and also helps with conversion of OEM-specific part numbers.

Where bearings have worn prematurely or failed there are usually several reasons. Using state-of-the-art bearing failure analysis, lubricant analysis and dimensional measurement equipment, NSK can identify the root cause of problems and make recommendations for improving bearing choice and machine design.

Expertise on tap

NSK's worldwide expertise covers many industries and sectors. But you don't have to rely on it alone. NSK also offers training to enable your own engineering team to strengthen their bearing knowledge, tailored to your needs – often based on the information gathered during Process Mapping.

Whether that's bearing fitting and maintenance, diagnosing failure modes or selecting the best bearing specification, NSK training options can help you to develop in-house expertise to reduce your bearing-related costs.

So whether you're experiencing unplanned maintenance issues, or you want to train your production and maintenance teams in new skills, the NSK Added Value Asset Improvement Programme can provide the bearing engineering expertise you want to acquire. And save you time, money, and energy, reducing your overall total cost of ownership.



IN ACTION

A mining and metals company was experiencing repeated failures on a fully-mechanised bolting machine, used underground for rock reinforcement. The harsh environment, with exposure to water and abrasive particles, was resulting in a service life of just two months for deep groove ball bearings in the machine's gear mechanism.

NSK assessed the situation and found hard contaminants entering the bearing were the cause of failure. A trial with NSK Molded-Oil bearings resulted in immediate improvement and 300% longer life for both the bearings and gears. The resulting cost saving was over £12k p.a.

A potash processing plant had problems with chain conveyors equipped with tapered roller bearings. In tough operating conditions with production dust and a high shaft temperature, the bearings failed several times a year, causing additional maintenance costs and unplanned stoppages.

The customer required at least 12 months' operation between planned maintenance periods. NSK discovered that plummer blocks from both sides of the shaft lacked a free-end system – potentially shortening bearing life. Installing SNN Series Plummer Blocks equipped with Spherical Roller Bearings, and with increased radial clearance and additional heat treatment, enabled problem-free operation until scheduled maintenance, and saved £7k p.a. on downtime and maintenance.

A supplier for a major brewer was experiencing repeated bearing failure on their grain stirrer application in germination vessels. Frequent bearing replacement was resulting in high costs and loss of production. NSK reviewed the application and recommended a Spherical Roller Bearing with NSK's Super Wear Resistance material.

The bearing change produced a 400% increase in bearing life and a reduction in unplanned downtime – ultimately saving the customer £54k p.a.

1

2

3

MAKE THE MOST OF YOUR ASSETS



xylem

Paul Winnett
General Manager

Refurbishment is a highly cost-effective method of maintaining the productivity and optimising the operation of your assets. In almost all cases, across most types of assets, in almost all industry sectors, the benefits easily outweigh the costs. But we're going to consider the situation specifically in the water and wastewater sector.

Equipment age is an obvious factor affecting plant efficiency, reliability and productivity. In this particular sector, it's also important to bear in mind the requirement to maintain high health, safety and environmental standards. That's why it's important to refurbish assets to meet those standards, and to ensure uptime and efficiency.

As leaders in innovative water solutions through smart technology, Xylem has extensive experience and expertise in water and wastewater asset refurbishment, to help reduce capital expenditure and increase the life of your assets.

And it's all brought together in a package of services called Xylem TotalCare.

Upgrade your assets

Maintaining the productivity of your water and wastewater equipment requires optimised operations with minimised lifecycle costs. That starts with an equipment condition assessment by Xylem experts.

Experienced Xylem system engineers evaluate the condition of your assets, and recommend any upgrades required to ensure optimal reliability and efficiency. This TotalCare service can also include a site audit, design and refurbishment, and asset conversions or upgrades as required.

One potential upgrade would be to a wastewater pumping system with integrated intelligence.



REFUBISH
assets to ensure
UPTIME and
EFFICIENCY

The intelligent choice

Most of the recent attempts to improve pump efficiency have revolved around replacing standard induction motors with premium efficiency motors. This is a minor improvement, resulting in just a few percentage points increase in pump system efficiency. However Flygt Concertor, the pumping system with integrated intelligence, can deliver much lower operating costs, as well as breakthrough pump system efficiency improvements.

These efficiencies are realised in pump hydraulics, the motor, and the pump system. In many sewage lift stations, energy savings alone can equal up to 70%.

At the same time, integrated intelligence can add unparalleled flexibility and increased reliability, all contained within a smaller footprint. Cleaning costs are reduced, additional functions can be incorporated, equipment life can be extended, and reliability of the whole pump system can be optimised.

Not surprisingly, customers who have trialled this new technology with Flygt Concertor have been more than impressed by the results.



Leaner asset management

Another important benefit of upgrading your wastewater asset to an integrated intelligent pump system is the reduction in the number of individual components.

This simplification means you can cover a larger field of performance with just a handful of component options – such as pump volutes with different discharge sizes, an impeller for each volute, and two or three sizes of motor. In this way, one intelligent wastewater pump can cover the hydraulic performance of numerous different conventional pumps and their different impellers, volutes and motors.

As a result, your spares stock and inventory costs can be greatly reduced. With just a few spare pumps being enough to cover many different operating conditions at several different pump stations, you can realise significant capital savings.

To identify whether an integrated intelligent pump system is the next logical upgrade for your assets – or whether an asset refurbishment will be enough for you to meet your efficiency, reliability and productivity targets, take the first step towards intelligent asset management, with Xylem TotalCare. It will make the most of your assets, with the least of your effort.

XYLEM IN ACTION

Unblocking efficiency improvements

A sewage lift station was suffering frequent and repeated pump blockages, requiring the pumps to be lifted out for maintenance. Xylem TotalCare identified the root cause of the problem, and upgraded the pump impeller to eliminate clogging. This delivered sustained efficiency and reduced energy consumption.

Healthy savings

Two large UK water utilities were seeking improved UV plant robustness and system availability, through the introduction of the latest UV lamp and ballast technology. Xylem undertook a service agreement to make annual health checks of each UV installation, to refurbish up to 4,500 ballasts, and to upgrade lamps to the latest Ecoray® technology. The result is energy- and cost-savings of up to 15%.

LOCTITE HAS CONVEYOR BELTS COVERED – IN JUST TWO HOURS

Extend belt life by up to **70%**



LOCTITE

Bob Orme
Senior Technology Specialist

Life never quite works out how you want it to. Conveyor belt life is no exception.

If belt cover and carcass was to wear out simultaneously, you could say you have achieved optimum life. But in the real world instead of your dreams, that never happens. The belt cover wears through. The carcass stays intact. But the whole system's life expectancy is compromised.

At best, the conveyor will have to be removed from service long before its time. At worst, the damage could lead to catastrophic failure, loss of production, unscheduled maintenance downtime and even injury.

So if life doesn't live up to your dreams, can you at least make it less of a nightmare?

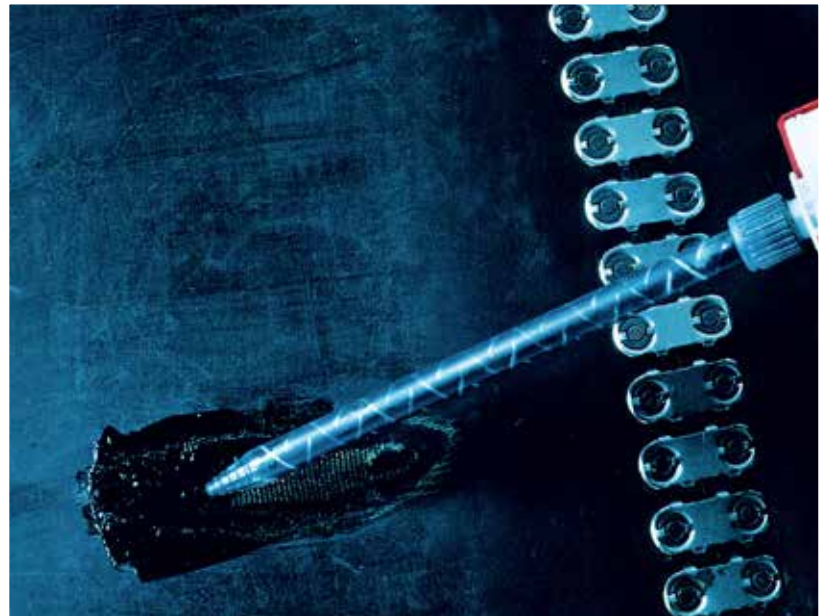
Dare to repair

Even a running repair has to be tough enough to withstand normal working conditions. And if the tensile strength of the carcass on the damaged belt isn't sufficient to withstand drive and take-up forces, then replacing the section is almost certainly the best and safest option.

But if only the cover is damaged – even across a large area – there's a simple, secure and speedy solution.

Based on polyurethane technology, LOCTITE has just what you need for a proven, lasting repair even in the most hostile of environments. LOCTITE's polyurethane adhesives are suitable for a huge range of applications, because they're

“SIMPLE, SECURE, SPEEDY SOLUTION WITH A PROVEN LASTING REPAIR...”



available in everything from highly rigid to extremely flexible grades.

LOCTITE PC 7350 is a one flexible formulation that's designed specifically for conveyor belt repair.

Quick cure

LOCTITE PC 7350 is a two-part polyurethane compound that cures quickly at room temperature. So it's ideal for on-site running repairs of conveyor belts and numerous other rubber parts too: including rebuilding liners in mills, pumps, feeding bowls, hoppers and chutes, and repairing cast urethane screens and liners.

All you have to do is abrade the damaged area to create a uniform surface, apply a LOCTITE etching agent, and wait for up to a minute for it to dry. Then the belt is ready to repair.

Attach the mixing nozzle to the LOCTITE PC 7350 cartridge, and apply the adhesive to the primed surface before smoothing it using a plastic spatula. (The product is self-levelling, so there's no need for perfection.)

A US mining company uses this system on its stone conveyors, and has restored belts to full working order within just two hours. And an Australian manufacturer has achieved repairs to the same timescale – in a ship-loading application that had been losing up to £7,000 per hour through delays caused by belt damage.

But it's not just cost savings from quick and timely repairs that make this LOCTITE solution so effective. A quality repair can even extend belt life too – by up to 70% in most cases.





TIME
SAVINGS

THE **MECHANICAL
FUSE** FOR
EXTRUDERS



Rob Hucker
Global Product Manager Shaft
Management Solutions

What's the difference between single screw and twin screw extruders? Twin screw extruders have twice as much chance of screwing up. All it takes is over-feeding or foreign body ingress and at best you have an extruder jam on your hands. At worst, you have damaged screws or a damaged gearbox. Unless, that is, you've fitted the Rexnord XG Series Autogard Torque Limiter.

The Autogard Torque Limiter works like a fuse in an electrical circuit, which prevents a current overload from spreading throughout the circuit and affecting everything that's connected to it. In the same way, the Rexnord Autogard Torque Limiter prevents the effects of an extruder screw jam from damaging the gearbox.

“COMBINING
MISALIGNMENT
SAFEGUARDS WITH
TORQUE LIMITING
PROTECTION...”

Fitted between the motor and gearbox, the Torque Limiter detects a jam as soon as it happens, and instantly disengages the driving motor from the extruder gearbox: disconnecting and separating the inertias.

The Rexnord XG Series also has a feature which sets it apart as the best on the market.

As a completely free-running torque limiter, when the Rexnord XG is disengaged it will continue to run even with the motor still spinning. There's no need to turn the motor off, and even if the jam and disconnection aren't spotted immediately, there's no additional harm done. This free-running capability also means there's no wear, and less risk of damage, to the Autogard itself – which means it has a longer service life.

But that's not all that's better about the XG Series.

Best of both worlds

Rexnord Wrapflex is an elastomeric coupling which allows for misalignment of the gearbox and screws, but doesn't offer torque limiting. Now the new Rexnord XG Series combines the misalignment safeguards of Wrapflex with torque limiting protection, to provide the best of both worlds.

In addition, the XG Series is quick and easy to reset, with no special tools required.

The distinctive features and functions of the XG Series are a result of extensive consultation with global OEMs, to understand exactly what's required from a torque limiter. By analysing shaft diameters

on motors and gearboxes, Rexnord have been able to design the XG Series to the smallest possible size at the lowest possible weight, to help reduce cost and wear while still providing optimum protection for your capital equipment.

“OPTIMUM PROTECTION
FOR YOUR CAPITAL
EQUIPMENT...”

Successful drop-out

When disengagement of driving and driven sides is needed for repair or maintenance, the Rexnord XG Series makes it a quick and easy manual process. And the same process in reverse makes it just as quick and easy to set-up.

Should you ever need to replace the limiter, a “replace in place” drop-out option allows you to remove the limiter from its position between the gearbox and motor, without having to move either of them. Since they are often bolted in position, that's a time-saving option which can greatly reduce downtime.

Whether it's a result of maintenance, repair, or an extruder jam, downtime can cost a business many thousands of pounds in lost production and financial penalties from customers. So the effectiveness of the Rexnord XG Series Autogard Torque Limiters means they're not only a mechanical fuse for your extruders. They can also stop your Production Manager from blowing a fuse.

REXNORD IN ACTION DROPPING THE CLUTCH

A customer's plastic extruder drive, used for extruding plastics for the production of bottles, operates under extreme conditions at the limits of its performance. This makes it essential to have an accurate and reliable overload device to protect the equipment from damage.

The extruder's gearbox was originally supplied with a friction clutch for overload protection. However this proved unreliable, and required frequent maintenance due to wear. Adjustment was also inaccurate, resulting in costly production stops.

An Autogard XG Series Torque Limiter was retrofitted to a new gearbox, and accurately adjusted to protect the extruder from torque overloads, to within 5% of the setting torque. The ball detent design of the Autogard XG also helped to reduce operational wear.

By providing accuracy, repeatability and reliability, the Rexnord solution resulted in an overall improvement in production, as well as protecting the customer's assets and reducing their total cost of ownership.





DON'T LET THE FACTS GET IN THE WAY OF A GOOD STORY

The media loves a good innovation story that offers us a glimpse of a bright new shiny future.

The recent electric cars story is a case in point. The BBC, and to be fair all the major media organisations, went full tilt at a government announcement about setting a target to ban the sale of new petrol and diesel cars from 2040 and force everyone to buy electric vehicles.

The BBC leapt into action, unable to resist any opportunity to get Steph McGovern out of a nice warm studio and into a factory, hospital or school (where do they get the kids from at that hour of the morning?) in order to “bring the story to life”.

And bring it to life she did, “Ooh, isn't it quiet” purred Steph from behind the wheel of an electric car, while that chap from Warwick Manufacturing Group told us all it heralded a new dawn for British car manufacturing.

If you were thinking, whilst watching all of this, “hang on a minute”, rest assured you were not alone.

It's not that I don't want to save the planet, but I've been around long enough to know that there is a lot of work to be done to make all of this happen.

For example, I am told that if you live in Worcester, the nearest current recharging point for your Tesla is the service station at Junction 2 of the M42. In other words, we need more recharging points, in itself a big job.

No trouble, I hear the ever-optimists say, we'll recharge at home. Only you can't because your average house only has a 13-amp ring main which isn't powerful enough. So, we're all going to have to rewire our homes too.

It gets worse. The UK is already facing a power supply crunch in the early 2020s as old nuclear reactors are decommissioned and remaining coal-fired plants are phased out. New ones cost a lot of money, as we are finding out with Hinckley Point C which currently has a projected cost of £19.6 billion. I don't know how many Hinckley Points we are going to need to recharge circa 26 million vehicles on a daily basis, but I'm fairly sure it's more than one.

Why was this target made public with no plan? My suspicion is that it was made to appease the environmental lobby, fully in the knowledge that no Minister, currently in post, will be around to explain why we've missed it.

THE TRUTH IS, AN ALL-ELECTRIC FUTURE IS ACHIEVABLE, BUT, LIKE ALL PLANS, IT IS GOING TO TAKE MUCH MORE THAN A FEW VAGUE TARGETS.



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80%

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80%

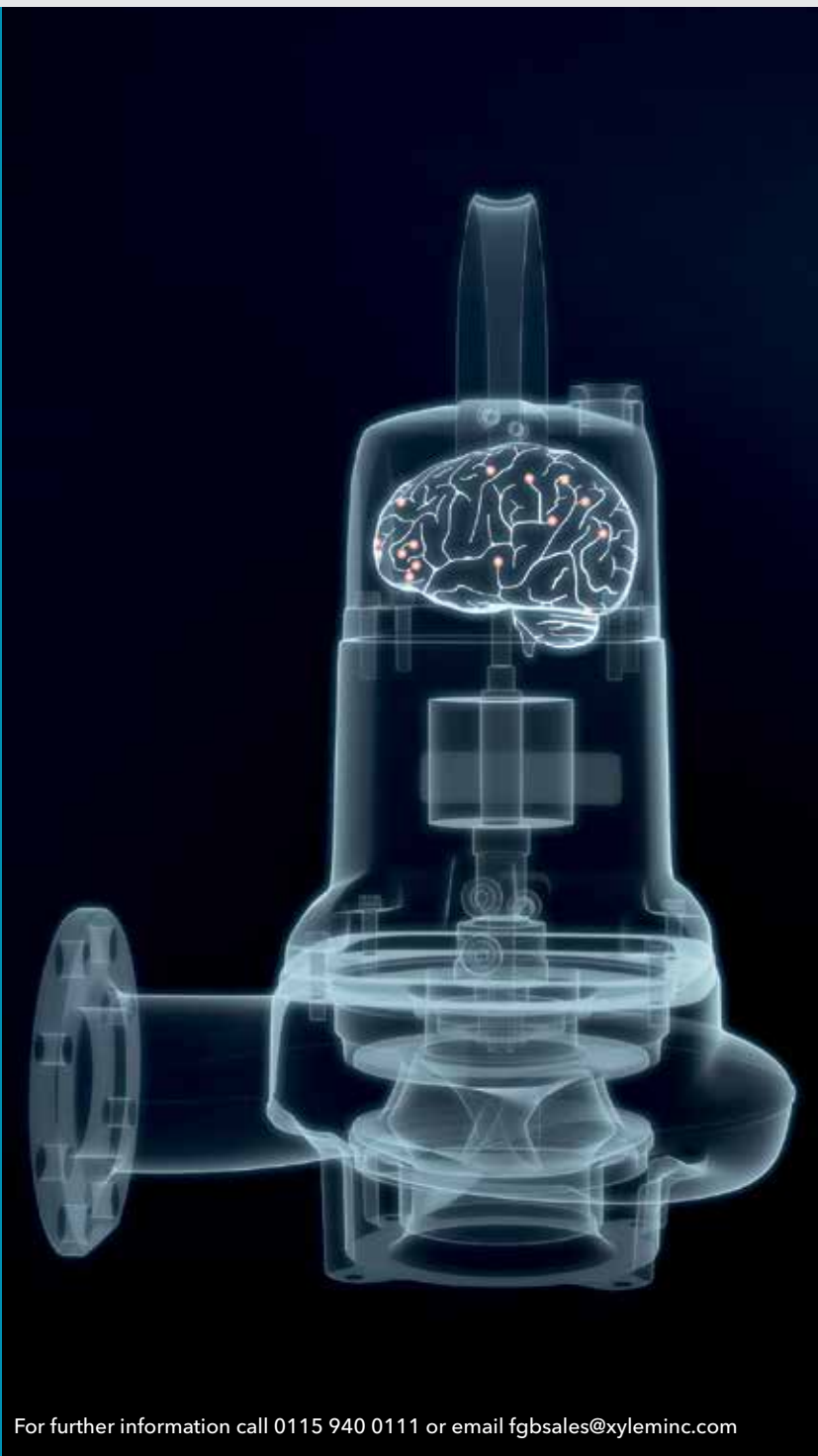
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CLEANING COSTS

70%

ENERGY SAVINGS OF
UP TO 70% COMPARED
TO CONVENTIONAL
PUMPING SYSTEMS

50%

CONCERTOR CAN REDUCE
THE SIZE OF CABINETS
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