

# Going beyond the repairable asset



The value and economics of plant reliability on a macro basis is something that is being missed by production/maintenance seniors, site principals and financial personnel. Europe's leading MRO service and supply specialist ERIKS looks at where the gaps are and how addressing them can transform the bottom line.

**This paper explores the balance between proactive and reactive maintenance strategies and the overall savings of these to the business.**

Maintenance is often seen as a necessary evil from a financial management point of view; maintaining manufacturing machinery, process equipment or warehousing equipment, including building services is always a cost to add on to the bottom line. However, more sophisticated predictive maintenance techniques used in tandem with full-service MRO supply and management service offerings can result in substantial savings in downtime, increased output and reduced fixed costs.

research and design centres and its own manufacturing base to look after, ERIKS not only provides the most comprehensive spread of maintenance services it is also the UK's largest industrial MRO component stock and distribution company.

Individual repairs and replacements are still a vital part of ongoing maintenance at any industrial site, but, few senior management professionals have an intimate technical knowledge of physical plant machinery and how it is maintained, similarly most maintenance operations personnel do not have a complete picture of the corporate KPIs, overall production output and how production output affects profitability for an entire site, or even less likely; the combination of several sites across the country. ➤

*Looking beyond the repairable asset is something Europe's largest MRO supplier ERIKS is asking both financial and site management professionals to do.*

With over 30 specialist engineering sites across the UK, including large scale electromechanical repair workshops,



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This lack of crossover knowledge has to be addressed in order to direct MRO investment and achieve the maximum potential efficiency of a plant. There are many software solutions on the market that can provide management information based on what is happening on the production floor or distribution warehouse; MES software, SCADA systems, and ERP systems between them can be used to bridge the information gap based on an ideal picture of plant operation.

What these systems cannot do however is to look at the entire plant and then break it down into its component parts and make suggestions where maintenance can be avoided, efficiency

increased or reliability improved beyond that of the original plant capability. Most plants also now measure performance against real-world figures, not what was promised by the original manufacturers or systems installers.

This is where plant-wide electromechanical and maintenance services can be applied to effect change in real-world circumstances. Expensive software systems will be very useful to track the improvements that have been made, once they have been made, or locate problems on a reactive basis. There still needs to be an experienced multi-disciplinary team of people in place to make pro-active changes and improvements in reliability of physical

plant and equipment in order to make improvements in productivity and reduce bottom line costs.

ERIKS offers a range of services, from a simple suite of condition monitoring and predictive maintenance services; through to national integrated service contracts where ERIKS takes responsibility for the maintenance of an entire manufacturing base nationally. The preventative maintenance services on offer also include partnerships with leading component suppliers such as SKF bearings, for which ERIKS is the only Certified Maintenance Partner with full UK national coverage.

Preventative measures start with basic vibration monitoring, thermal imaging surveys and oil analysis and stretch through to specifying better quality or more efficient replacement components and consumables – through to very detailed site surveys and online maintenance service scheduling of every component on a site. ERIKS will also tidy-up engineering stores and replace entire repair stock with sale or return items, man the stores, carry out the repairs, and take responsibility for key performance indicators on a site.

The company's expertise covers the entire span of UK industry and commercial premises, Gary Price head of the Electromechanical Repair Service team comments on the culture change that is needed to improve UK manufacturing performance and take advantage of the services on offer.

Reliability is one of the most undervalued aspects of the overall financial performance of any site. We have improved the profitability of huge manufacturing operations simply by fitting the correct seal to a critical piece of equipment, a couple of hundred pounds spent resulting in tens of thousands of pounds in increased profits.

We have replaced the stores in Military and Aerospace sites removing hundreds of thousands of pounds worth of devaluing inventory from the company's cost base. ERIKS Integrated Solutions (IS) is responsible for the entire MRO supply chain management for several of the country's best known food and beverage

brands, where we are able to deliver fixed cost reductions over a three and five year basis – providing total financial surety of maintenance operations.

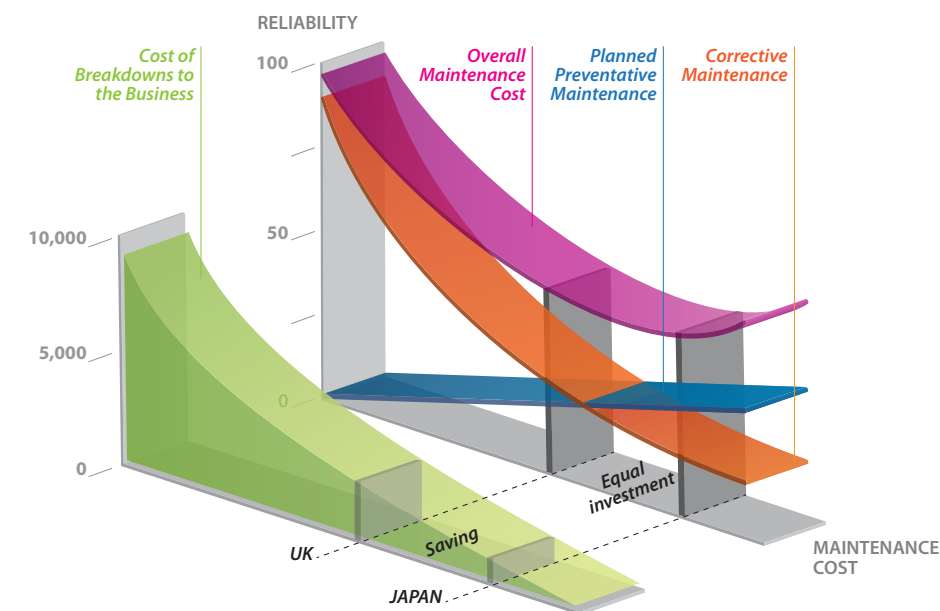
All of these examples illustrate how looking beyond the individual repairable asset can make a huge difference to a company's performance. It is not something an on-site repair and maintenance team can be expected to deliver, neither is it something that a senior finance officer can be expected to know.

Using experienced suppliers with a breadth of knowledge; experience and resources can bridge the knowledge gap and benefit both parties by delivering real-world positive changes. Improvements that are tailored to the specific needs of an individual management team or the opportunities for improvement that are unique to that site; whether it is manufacturing rocket fuel or storing frozen food, the savings are there to be made.

Once the point is conceded and outside help is sought, then it raises the thorny question for the maintenance team of how the additional expenditure is justified and how to balance expenditure with returns? It is all well and good recommending the use of outside professionals to find improvements beyond the repairable asset, but how are they measured and what can each service be expected to achieve.

There is a cost of carrying out maintenance which is generally the budgeted cost of the maintenance team, resources, stock of spare parts and the purchase cost of additional new materials and parts, including subcontracted service costs; these are quantifiable, but what is far more difficult is calculating the benefits of effective maintenance because often everybody else benefits except the maintenance team.

The balance has to be right between spending money on predictive maintenance and a reliance on reactive, corrective maintenance. The graph below shows how equilibrium is achieved in principle:



Source: Andy Watson – Sim Energy Ltd  
Case Study of the Implementation of Advanced Maintenance Techniques at BAA Heathrow Airport Ltd

ERIKS as a company is committed to helping maintenance teams get the most from their budget while also demonstrating the value that is gained as a result of the programme. One of the methods for calculating the overall benefits of maintenance measures is the practice of signing-off cost savings.

Effective signed-off cost savings should include: The repair cost of a breakdown that would have happened had a failure occurred (one that was predicted, by vibration analysis on a bearing supporting a critical piece of plant equipment for example, one that if it were to seize would stop an entire process site). The maintenance cost saving i.e. not having to perform on-going maintenance checks of the critical piece of equipment regardless of its status, because it is unknown other than at the point of checking.

Energy savings due to the fitment of more efficient electromechanical power transmission equipment or the reduction in motive power required as a result of reduced friction or improved balance. And of course the cost of lost production due to planned or unplanned downtime – the cost of unplanned downtime is usually far higher due to lost production that was expected and the knock-on effects it has for the rest of the business. Maintenance teams have to be able to justify investment made by the company in them and their systems and this is an ideal way of achieving it.

A great example is the implementation of a critical plant survey, this practice records every piece of electromechanical equipment on a site and grades it based on its importance in

the effect a breakdown would have on product, including the speed of repair or replacement. Having surveyed the site, the wear items found to be of most importance to the site are then monitored, either continuously by fixed sensing systems or periodically by mobile sensing devices.

A recent project undertaken by an ERIKS maintenance team at a large pharmaceutical production site in the UK identified remedial maintenance work that was carried out without having any effect on production that resulted in an overall cost saving of £78,000, the investment in the survey and the work carried out, including labour and components was a fraction of that amount, but without the full calculation the pro-active work carried out on a plant, that on the surface looked to be OK, would have been hard to justify.



A useful method of quantifying the positive effect of maintenance best practice is to apply an overall equipment effectiveness (OEE) calculation, a vital component of

Lean Manufacturing philosophy. OEE provides a methodology for calculating the overall effectiveness of the equipment deployed by measuring and then optimising the efficiency of a machine's performance or that of a whole manufacturing plant.

### The OEE score is made up of three components:

**Availability (A)** – percentage of uptime of each asset.

**Performance (P)** – percentage throughput against target.

**Quality (Q)** – percentage of scrap or waste.

### When multiplied together

**$A \times P \times Q = OEE$**  and measures each different form of wastage in any manufacturing process.

Once the OEE calculation has been made, a gap analysis is undertaken between the current plant efficiency and the desired target or benchmark. The necessary investment and optimisations can then be undertaken and progress monitored through the Overall Equipment Effectiveness calculation.

It is possible to strike the right balance between pro-active maintenance and traditional reactive maintenance, and for maintenance teams to prove both the efficacy of this approach and the overall value to a business. This goes to underline that finding the right suppliers and making best use of internal resources, while monitoring and reporting on cost savings as well as expenditure is also vital to successful use and implementation of the latest predictive techniques that are available.