How to reduce obsolescence risks

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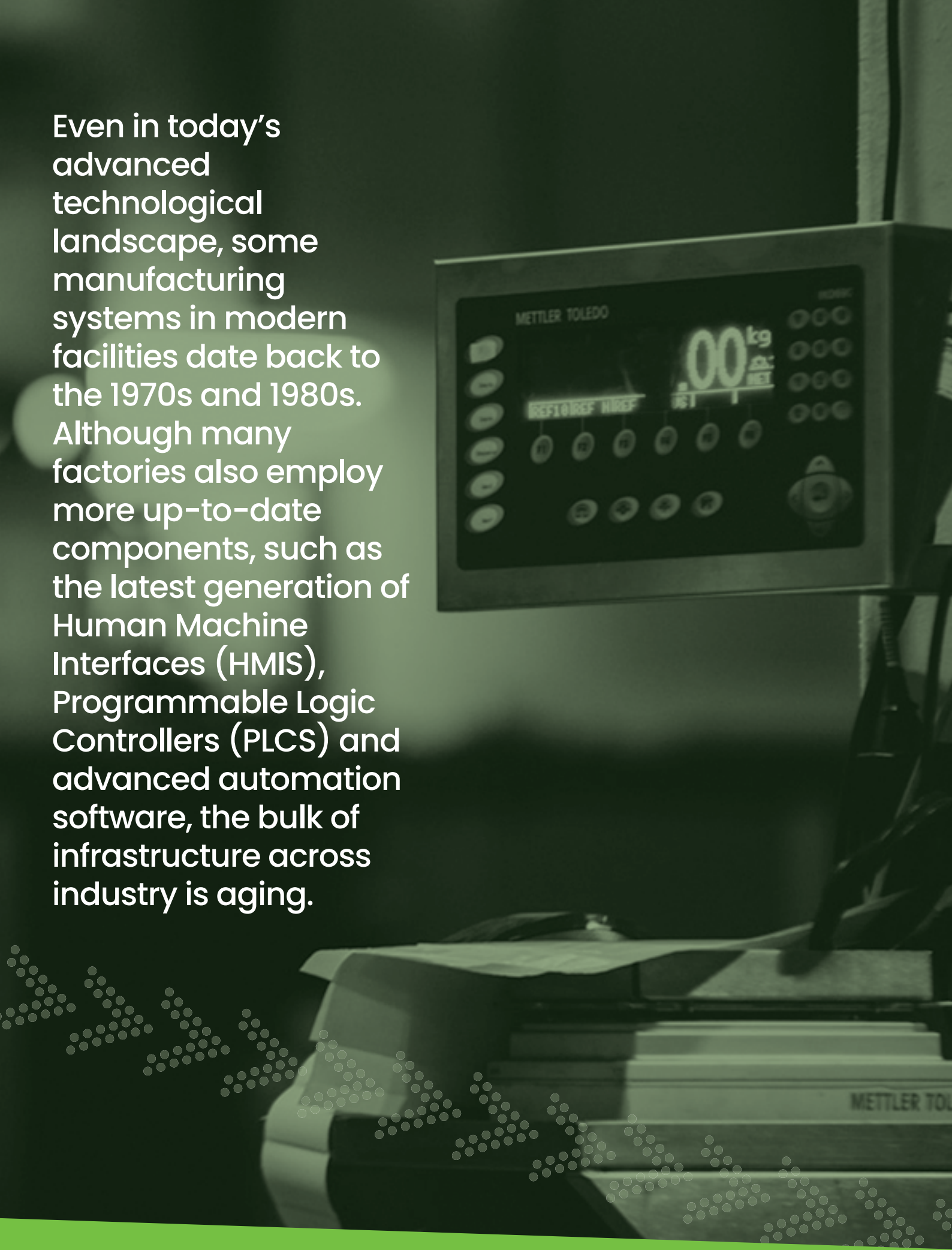
Even in today's advanced technological landscape, some manufacturing systems in modern facilities date back to the 1970s and 1980s. Although many factories also employ more up-to-date components, such as the latest generation of Human Machine Interfaces (HMIS), Programmable Logic Controllers (PLCS) and advanced automation software, the bulk of infrastructure across industry is aging.



Section 1:
Reasons for obsolescence

The lifespan and ruggedness of industrial automation equipment is certainly impressive, with some systems lasting several decades before they need replacement. In fact, a recent study shows that more than 90 per cent of process organisations are still using the same aging industrial automation equipment they have used for decades beforehand. Inevitably, new equipment is not a priority on the shopping list of these organisations.

Perhaps more surprisingly, many process companies are continuing to use machinery past the obsolescence date set by the original equipment manufacturer (OEM). Essentially, this means out of date machinery.

For the OEMs, shifts in technology and an inevitable economic impact have meant that some assemblies have fallen into obsolescence. 30 years on from their original production date, replacement parts have become incredibly hard to come by for manufacturers and industrial organisations. However, while it certainly plays a big part, supply chain fragility is not the only issue causing equipment obsolescence in industry.

The long life cycle of industrial machinery, often has a negative effect on its ability to run, which means breakdowns can sometimes occur. In a landscape with so many reasons for obsolescence, how do organisations ensure they prepare for the inevitable disaster of a broken down industrial part?

Assess and evaluate
A facility condition assessment (FCA) is an in-depth review of the physical condition of various systems within an industrial application. Intended to detect reasons for the deterioration or failure of systems, an FCA can provide recommendations on replacing or upgrading machinery. By estimating a cost of reinvestment, organisations can then make informed decisions on budgeting for obsolescence management and prioritise for maintenance, repair or renewal of equipment.

Similarly, a facility performance evaluation (FPE) also helps manage the life span of machinery in an industrial environment. However, unlike an FCA, this evaluation is continuous. Typically, an FPE will extend beyond the physical assessment of machinery and instead, will put obsolescence at the forefront. By reviewing the cost-effectiveness, functionality, productivity and sustainability of equipment, the results of an FPE, sometimes referred to as a functionality index, can be used to intelligently create an obsolescence management plan, helping you to decide whether to replace or upgrade.

On first assumption, without undergoing an FCA or FPE process, many organisations would believe that upgrading the broken down part to a newer, more advanced piece of equipment would be the obvious solution, but that is not always the case.

Section 2:
Replace or upgrade

Risks of upgrading
One of the key risks of upgrading to new models of equipment lies with the complexities of integrating new machinery into the existing infrastructure. Assemblies that are more than 20 years old are usually designed to work exclusively with equipment of the same make or model. While it is possible to integrate differing machinery into these infrastructures, retrofitting or system expansion often requires expensive adaptations and adjustments - not to mention the expense of training employees to use the new equipment.

Speaking of expense, when a part has failed or broken down, the costs of purchasing brand new equipment can dramatically outweigh the price of replacing the part with a used component. There is a misconception that replacing a piece of machinery with the same, aging model, is a waste of money as the part will have been exposed to wear and tear since its original production. In actual fact, it is not uncommon to source replacement machinery that has never been used by another manufacturer and has simply been stored away since its production.

Above all risks, there is a clear reluctance from organisations to upgrade industrial equipment to newer, unfamiliar models. When a manufacturing plant has been running for decades using the same equipment, with no operational issues, there will be fear and hesitation surrounding change to the current machinery from members of the board, stakeholders and factory floor staff.

Risks of replacement
The benefits and risks of replacing and upgrading equipment are not completely black and white. There are a number of pros and cons to both options. In truth, the best decision depends on the unique situation of the organisation.

When choosing to replace a broken down part with a spare of the same make and model, something to consider is the regulatory requirements that have been put in place since the equipment's production date.

For industry, the number of regulations organisations must adhere to has increased dramatically in the past few decades. Today, manufacturers must comply with requirements regarding power consumption, energy management and employee safety. Back in the 1970s and 1980s, when much of the industrial automation equipment still in use today was produced, there were fewer regulations. As such some older generation industrial automation parts struggle to pass modern compliance tests.

When considering these risks, research is vital. For organisations sourcing a replacement part, it is worth broadening your horizons and seeking help from an industrial automation supplier. Many suppliers will allow customers to search for an item specifically by its make, model, production date and even product code and from there, the supplier can advise manufacturers on the correct product to choose.

Section 3:
You've replaced it, what's next?

Training the workforce
It is no secret that the engineering industry is suffering a skills shortage. In fact, at the Advanced Engineering UK show in 2015, engineering giant Siemens discussed how this skills shortage is forcing organisations in the sector to choose candidates from fields beyond advanced engineering. Rather than the specialist graduates it would usually select, the engineering industry is now opening its arms to candidates from IT, games design and science backgrounds.

Typically, these candidates will have spent their time at university learning about visualisation, mobile technology and Android devices, all upcoming trends that are beginning to be incorporated in the world of industrial automation. With advancements in technology and an increase in engineers from these backgrounds, it is no surprise that the upcoming engineering workforce is predicted to hold a greater knowledge of technology than their predecessors do, but will they understand the basics too?

Industrial environments are gradually beginning to embrace new technology such as automation, robotics and cloud computing, but it remains vital for new engineers to understand the complexities of aging industrial systems too. As you would suspect, the idea of graduates entering the industry from a different field has generated scepticism amongst some.

Many of the engineers who worked to design and install existing infrastructures in today's factories are likely to have since moved jobs or even retired. By the time system maintenance and obsolescence management is required, a new generation of engineers may have taken their place.

Of course, young engineers cannot be expected to hold the same level of knowledge as the industry veterans before them. As a result, developing a training program to fill their gaps of knowledge is essential.

When it comes to advanced industrial machinery, training and development cannot end with an instruction manual. Employees, young and old, need to know about system design, installation, configuration, programming, maintenance, diagnosis, troubleshooting and repair. Unfortunately for manufacturers, a recent ARC study has shown that 58 per cent of companies have faced difficulties in training young engineers and technicians to operate and maintain older control systems, the equipment that over 90 per cent of organisations continue to use.

For organisations, poor employee knowledge is an issue easily ignored, but leading an undertrained workforce can cause much more damage than a poor reputation. In fact, employees that have not undergone the correct training can have a negative impact on metrics such as downtime, logistics, vendor support expenses, overtime and inventory scrap rate. Considering the skills shortage the industry is facing, training should be a top priority.

Set your goals
Employee training is essential, but at the same time, it is important for manufacturers to set an organisational obsolescence management plan too. It may seem an obvious suggestion, but in the same ARC study, 58 per cent of organisations admitted to having no formal plan to manage the lifecycle of their industrial equipment.

However, many organisations do have maintenance, repair and overhaul (MRO) procedures. In order to cut carrying costs, organisations will examine the turnover rate of each part and will reduce their inventories accordingly. Usually pushed by the internal financial entities, companies might throw out the parts that are not turning over quickly. While, intuitively, this strategy makes sense, the opposite should apply to obsolete components.

For any firm continuing to use equipment from ten, 20 or even 30 years beforehand, it is helpful to carry extra inventory in case of potential shortages. By holding a small inventory of obsolete or likely to become obsolete components, organisations will be prepared in case of a part breakdown. In contrast, MRO operations can leave organisations with little choice other than to purchase a brand new part.

Hoarding an inventory of replacement parts may not be ideal for manufacturers struggling with economic issues or storage, but spare part replacement strategies should involve more than simply stockpiling parts.

(Continued)...Section 3: You've replaced it, what's next?

Companies that do not have the space or capacity to hold an inventory of parts should work closely with industrial automation suppliers to ensure they can obtain the required part in record time in case of a breakdown.

Quick and easy obsolescence management plan
Every manufacturer can benefit from a regular facility performance evaluation (FPE), which will help the company calculate the correct amount of spare parts it needs. By determining the condition and supply of the spares, companies can rest assured that when it comes to replacing equipment, they have a backup plan.

That being said, many organisations do not have the resources to get an ongoing FPE process off the ground. Usually due to a lack of staff, there is nobody responsible for creating, monitoring and updating a database of required spares, therefore, tasks to manage obsolescence are overlooked.

For companies where a complex FPE process is unfeasible, a simple obsolescence management plan should be considered instead.

Put simply, a three-step obsolescence management plan is a strategy that helps organisations make decisions when an industrial part breaks down or reaches its obsolescence date. The ultimate goal of obsolescence management is to identify risks in order to determine which approach to obsolescence management makes more sense financially: upgrading an existing part or the entire system or maintaining your current system through repair or replacement.

The first step is for organisations to identify the goals of the obsolescence plan, whether it is to save money, improve efficiency or simply to educate the workforce on obsolescence maintenance. More often than not, a successful plan involves the combination of all three goals.

Next, conducting research to determine which parts are most at risk and why they are at risk can help identify a cost and time-effective. It can also help steer buying decisions in the long run.

Lastly, the organisation should ensure the strategy is implemented on a daily basis. Often, this will involve an employee adding obsolescence management to their set of general responsibilities. The company should also implement the obsolescence management aspect into compulsory company training and set a strict procedure for what happens when an industrial part breaks down, with obsolescence management at the forefront.

Without obsolescence plans, organisations risk increased downtime, decreased inventory, fines and a slump in productivity. In fact, an ineffective obsolescence management process can extend downtime by 15 to 35 per cent. This figure is worse for organisations using components past their obsolescence date.

Find a supplier
For organisations choosing to follow an obsolescence management plan, it is also essential to identify and build a relationship with a trustworthy supplier of industrial automation components. Manufacturers that don't have storage capacity for spare parts can benefit the most from working with a supplier. It may sound simple enough, but there are many things an organisation should consider before choosing a supplier.

It is unlikely there will be a supplier out there that consistently stocks all of the industrial components that are at risk of obsolescence or failure. Rather than acting simply as storage units for industrial parts, most industrial automation suppliers pride themselves on their ability to quickly find, purchase and deliver the parts their customers require, whether they hold them in stock or not. An industrial automation supplier with a strong network of connections and a good delivery record is often more valuable than one with large storage facilities.

Firstly, a manufacturer should analyse which automation components are likely to fail due to age or wear. If the part is only available to source from overseas, choosing a supplier with international reach is essential. While some manufacturers will choose a supplier based locally, many will discover that when it comes to supplying industrial parts, the location of the supplier is irrelevant. The best suppliers of industrial automation will go above and beyond to get the part to the destination, no matter where in the world the customer is located.

Another thing to consider is how detrimental the risk of downtime is for the company. For organisations where downtime can result in great financial losses, it is worth seeking out a supplier that guarantees short response rates and quick delivery, ensuring costly downtime is kept to a minimum.

By choosing an industrial automation supplier with a good network of partners, fast delivery and exceptional service, manufacturers can rest assured that regardless of obsolescence and machinery failures, their operations will be back to normal, as quickly as possible.