

The smarter way to approach safety

Compliance with the latest machine safety regulations has implications for efficiency and productivity. **Paul Considine** of Wieland Electric explains how new technologies offer a smarter approach

One of the challenges facing machinery owners and manufacturers, as well as system integrators, is the need to ensure machines and systems are fully compliant with the latest legislation. In addition, when there is a problem that could cause a lack of compliance - resulting in expensive down-time - it's important to resolve the issue as quickly as possible.

The application of modern technologies has the potential to address both of these areas, saving time and money while also enhancing safety levels. This is particularly important in the light of changes to the Machinery Directive that came into force this year and apply to both new and existing installations.

The EU Machinery Directive requires risk assessment in accordance with the new harmonised standards EN ISO 13849-1 (Safety related parts of control systems, Part 1: General principles for design) and EN 62061 (Functional safety of safety related electrical, electronic and programmable electronic control systems). The changes have been introduced because the previous EN 954-1 was based on

Below: taking advantage of the latest technologies can mean a more cost effective way to achieve compliance with legislation



examines complete safety functions, including all of their components. However, it goes beyond the qualitative approach and includes quantitative assessment of safety functions.

EN 62061 defines requirements and provides recommendations for the design, integration and validation of safety related electrical, electronic and programmable electronic control systems for machinery. It is based on a combination of qualitative and quantitative examination of safety related electrical and electronic control systems, from the initial concept through to final decommissioning. Each safety function is divided into sub-functions which are assigned to actual devices.

This means that when there is a fault in the system, it's vital that the whole system closes down until safety can be assured. However, any such down-time can be very expensive. Consequently, it also makes sense to have effective fault diagnosis built into the system - ideally the same system that is responsible for safety related control functions.

This is where technology can lend a very cost effective helping hand. Traditionally, any safety alert would require manual inspection by engineers to locate the fault and rectify it. Plus, even though there have been electronic monitoring systems available, they have been very expensive.

Now there are relatively low priced systems that will take care of all of the safety monitoring and fault diagnosis without costing a huge amount. Not only will they continually monitor every aspect of safety, these systems will also quickly locate and diagnose faults - all from a computer.

For instance, Wieland has been working with a company that makes specialist pipework, where its lathes are vital to the productivity of the whole line. In the past, any problems necessitated calling out an engineer who would then have to find the fault and repair it. The result would generally be several hours of down-time at a cost of £10,000 per hour, per lathe.

Having installed Wieland's Samos Pro system, the company can now quickly interrogate the system, find the cause of the fault and, very often, rectify it immediately. If they do need to call a specialist engineer, less time is wasted as the location of the fault is already known.

Designing for efficiency

Another benefit of such a system is that it can be used from the early design stages, before the plant goes live. Simulation functionality enables the designers to run through the operations and identify any potential problem areas before they cause a real problem.

At a time when it's important to reduce overheads and maximise productivity, it makes perfect sense to look at smarter ways of doing things, and to find more cost effective ways of achieving compliance with legislation. Taking advantage of the latest technologies is the obvious way forward.

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calculated risk, setting appropriate system behaviours against categories. As programmable electronics have made their mark on safety technology, it is no longer possible to measure safety purely in terms of this simple category system. Just as importantly, this approach was unable to provide information on probability of failure.

Thus, EN ISO 13849-1 is based on the familiar categories from EN 954-1 and

Above: Wieland's Samos Pro system has assisted a company that makes specialist pipework, where its lathes are vital to the productivity of the whole line

Managing more efficiently

While there is much more to the new regulations, this brief description does illustrate the complexity that anyone involved in machine safety needs to get to grips with. However, as mentioned earlier, there are now technologies that can make compliance much easier in new and existing systems.

Clearly, the primary consideration is that the safety systems are operating properly at every level. For the sake of convenience and efficiency, it makes sense to address all of these levels, or sub-functions, through the same system.