

# Are you ready for a new standard of safety?

THE STANDARDS AND LEGISLATION SURROUNDING THE DESIGN, BUILD AND USE OF PLANT MACHINERY SEEMS TO GET MORE COMPLEX BY THE WEEK. AND NO MORE SO THAN IN THE FIELD OF SAFETY. HERE, TO HELP CLARIFY THE ISSUES, WE TAKE A BRIEF LOOK AT A COUPLE OF IMMINENT CHANGES.

Unless you've been following events closely, there's a fair chance that you're not 100% clear on the situation with respect to EN 954-1. That's because the European Commission has changed its mind a couple of times over the past few months. Originally, the Commission fixed December 29th 2009 as the date of changeover to EN ISO 13849-1, the new safety standard set to replace EN 954-1. Then, in September this year, the Commission announced that the transition period would be extended for three years. This announcement was followed by another, revoking (hang in there!) the decision to delay changeover, pending a meeting of the EC Machinery Working Group in December. Well, that meeting has now taken place and it has been agreed that the transition period for EN 954-1 will be extended after all. Note, however, that this extension is for an (as yet) undetermined time.

So, what changes will EN ISO 13849-1 bring, and what's their significance? First, it's worth reminding ourselves of a little history. When EN 954-1 was introduced in

1996, it set out a whole new criteria for the evaluation of safety system control reliability in machinery, and introduced the idea of the familiar Reliability Categories. Then in 1999, the first edition of EN ISO 13849-1 was published – essentially a straight adoption of EN 954-1, but using the ISO development model. In 2006, the second edition of EN ISO 13849-1 was published, with a mandatory implementation date set for the end of December 2009, and the two-year transition period began, during which either the 1999 edition or the 2007 edition could be applied for compliance.

But, unlike the first edition, the second edition of EN ISO 13849-1 carries significant changes from its predecessor. One of these is that, while EN 954-1 covers the design of safety-related control circuits, it does not adequately cover the specific requirements for programmable electronic systems.

Another major criticism of EN 954-1 has been that the standard used a qualitative approach to the assessment of safety

functions, where calculated risk was shown by categories. However, with electronics and programmable electronics increasingly incorporated into safety systems, safety can no longer be measured purely in terms of these categories. Neither can the old standard provide information on the probability of failure of these systems. Furthermore, there has been a tendency for components specified to a high category of EN 954-1 to be chosen instead of components that have a lower category, but which might actually have more suitable functions. The new functional safety standards are intended to encourage designers to focus more on the functions that are necessary to reduce each individual risk, and what performance is required for each function, rather than simply relying on particular components.

To this end, EN ISO 13849-1 defines a performance level (PL), using the following safety parameters:

- Category (structural requirement)
- PL (a – e): Performance level
- MTTFd: Mean time to dangerous failure
- B10d: Number of cycles by which 10% of a random sample of wearing components have failed dangerously
- DC: Diagnostic coverage
- CCF: Common cause failure

The standard describes how to calculate the performance level (PL) for safety-related parts of control systems, based on designated architectures. Where several safety-related parts are combined into one overall system, the standard describes how to calculate the PL that can be achieved for the system as a whole.

## CSP UK plays safe

Following a risk assessment, the CSP UK concluded that the valves operating a number of its 28" process valves, all supplying exhaust gases from the coke ovens to fuel the re-heat furnaces, were serving a critical function. This meant that if – for any reason – the process valves had to be shut down, the control valves must be guaranteed to operate in a failsafe condition. Further, because of the presence of flammable gases in the environment, all electrical equipment must be EX rated.

The solution? Simple – the Ross DM2C series valves. A complete range of control-reliable valves (3/8" to 2") suitable for CAT 4 (EN 954-1) and performance level 'E' (EN ISO 13849-1), they offer the highest possible safety rating and have been independently certified by the BG, an international test body for safety products and equipment. With full internal dynamic monitoring with lockout/reset capability, and an optional valve status indicator to report valve condition to the machine safety control, they were also fitted with explosion-proof solenoids to meet the required EX rating.



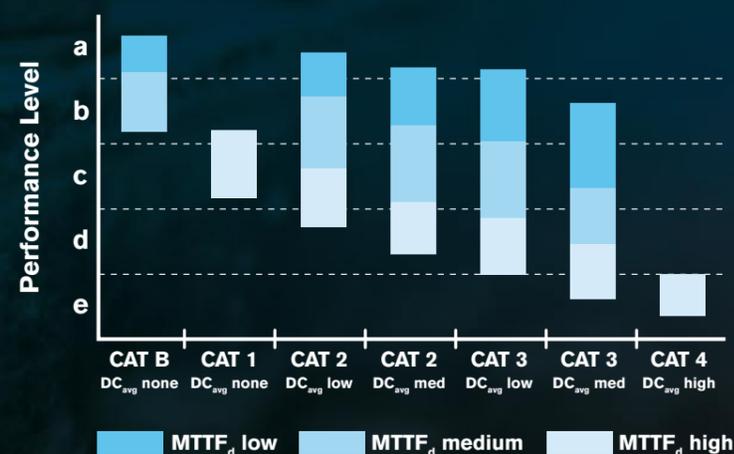
Another reason that 29th December is important is that a new version of the Machinery Directive, originally published as 2006/42/EC, comes into force. The Directive is really more of an update to the current directive, though there are some important changes for all parts of the industry, from machine manufacturers through to the end user. These relate mainly to the Directive's scope, partly-completed machinery, fixings for fixed guards, conformity assessment and safety components. There are also new measures relating to 'market surveillance' (i.e. enforcement) and certification – EC type-examination certificates issued under the existing Directive will not be valid after 29 December 2009.

But it is, of course, a complex area. To help you interpret these changing standards and directives correctly ERIKS has

partnered with Ross UK to provide the highest levels of support and experience in the area of pneumatic power. Having been at the forefront of pneumatic energy isolation for many decades, Ross has a Global Industry team whose sole purpose is to develop products to meet the demanding safety requirements for pneumatic safety, and is the perfect complement to ERIKS' own know-how.

### New and existing machines

Users of machines need to ensure that newly-purchased machines are CE marked, and accompanied by a Declaration of Conformity to the Machinery Directive. Existing machines taken into service before the Machinery Directive came into force do not need to comply, although they need to comply with PUWER and be safe and fit for purpose.



Based on a hazard and risk analysis, a performance level (PL) is assigned to a safety critical function.

