

Technical article, published in:
DER KONSTRUKTEUR 2023/03

A GLIMPSE INTO THE STANDARDS JUNGLE

PRACTICAL APPLICATION OF NEW STANDARDS BASED ON A PROJECT EXAMPLE

When planning and designing a machine plant, there is a range of standards and directives that must be taken into account, and it can be easy to lose track. If those standards then get amended while the project is ongoing, you need to pay special attention. Using an intralogistics project as an example, we'll show you why functional machine safety is so complex and what needs to be taken into account in different areas of machine and systems engineering.

When planning a system, you'll need to answer questions like these: What documents do I need to compile for compliance with the Machinery Directive? I have ordered a machine from China, does that make me a distributor? Can I achieve Performance Level d with your switch? Just these few questions are enough to demonstrate how complex the field of functional machine safety is and that there are many open issues that cannot just be resolved. This means that ever more companies are looking for support from qualified experts. The Schmersal Group offers just that, and has bundled its specialist expertise in its tec.nicum division. The tec.nicum team designs and accomplishes projects and safety solutions in all lifecycle phases, including development, manufacturing, sales, operation, modernisation and retrofitting and decommissioning of machines and systems around the world, and offers advice and assistance on complicated legal and technical topics associated with the safety of machines and safety.

The range of services offered by tec.nicum is just as heterogeneous as its customers. Some already have ample experience with this multifaceted topic and need nothing more than a technical opinion or a partner for certain project work. Others are new to the topic of machine safety and need more all-round support.

tec.nicum has divided its range of services into needs-based modules that customers can order according to their specific requirements – from answering individual questions through a tec.nicum support ticket to a full range including risk assessment, planning, integration, commissioning and documentation.

Practical example – amended standard for storage and retrieval machine

tec.nicum also offers support with correct implementation of amended standards, as this example of a manufacturer of storage and retrieval machines demonstrates. These machines are subject to a machine-specific C standard, EN 528, which is harmonised under the Machinery Directive (MD).

As this was the first time the company was producing this class of machine, it was looking for all-round advice. This included a series of safety meetings to define a strategic workflow that would include all requisite steps leading to a fully compliant machine. The project also involved tec.nicum carrying out a risk assessment with the manufacturer, verifying and supplementing the safety concept under the C standard, documenting the functional safety with specification of the safety functions (SF), visualising the SF with schematic diagrams and performing the SISTEMA calculation for each SF. The tec.nicum team also worked with the manufacturer to compile the assembly instructions, performed a check of and documented the electrical safety and completed EMC measurements and functional tests in accordance with the EN 528 checklist.

During the course of the project, however, it became apparent that in 2019, the standards committee had developed a draft for a new EN 528. This draft included correct application of DIN EN ISO 13849 in EN 528 and structural and technical improvements to reflect the current state of the art.

The tec.nicum team analysed the content and highlighted the differences between the draft and current standard. Importantly, the team worked out the technical changes brought about by the new standard content so that the manufacturer could develop appropriate solutions. As an example, the old standard required 19 safety functions, the new standard requires 34. To this end, they prepared comparison lists of the standard versions with change analyses.

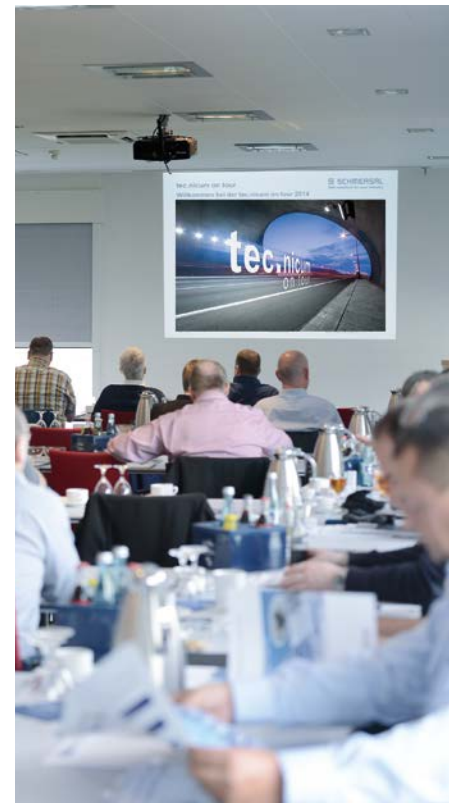


Fig. 1: The tec.nicum academy offers a comprehensive training and seminar programme on topics machine and plant safety, e.g. about safety-compliant design.



Fig. 2: Safety consulting is indispensable in many sectors, for example in logistics.

tec.nicum consultants are aware that final changes can still find their way into the final valid versions of the standard. With this in mind, documents for compliance with the MD, such as the risk assessment and assembly instructions, were left unchanged and only amended to the new standard after its publication in 2021. This actually made quite significant changes, including to the structure of the chapters.

The tec.nicum team provided support to the manufacturer in adapting the safety concept and developing new safety functions. tec.nicum experts verified whether the existing technical measures were enough to accomplish the SF required. In some cases, they weren't – one new SF required the planning and installation of a new sensor, something that had not been required before. Overall, however, it was not ultimately necessary to implement all of the safety functions of the new standard (and not all of the old standard) as this particular storage and retrieval machine had no transfer device or operator platform.

tec.nicum specialists helped the manufacturer implement precisely those safety functions that the amended standard required, without having to fit the machine with too many safety components.

K.A. Schmersal GmbH & Co. KG
Möddinghofe 30
42279 Wuppertal
Phone: +49 202 6474-0
info@schmersal.com
www.schmersal.com