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The Engineering City Journal

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The purpose of the Journal is to disseminate knowledge, experience, and best practice in engineering & manufacturing.
The articles are written by practicing professionals in the Engineering City (EC). They cover issues relevant to their projects, operations, and organizations.
The articles address the challenges of the time. As such, the Journal is also a chronicle of the evolution of the EC, its companies, and its individuals.
It is the aim of the Journal to advance the engineering & manufacturing practice, to enrich the engineering & manufacturing community, and to contribute to the worldwide discourse in engineering & manufacturing.

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Management Corner

. Design for Safety – the Paramount Responsibility of Engineers

by Rama, EA

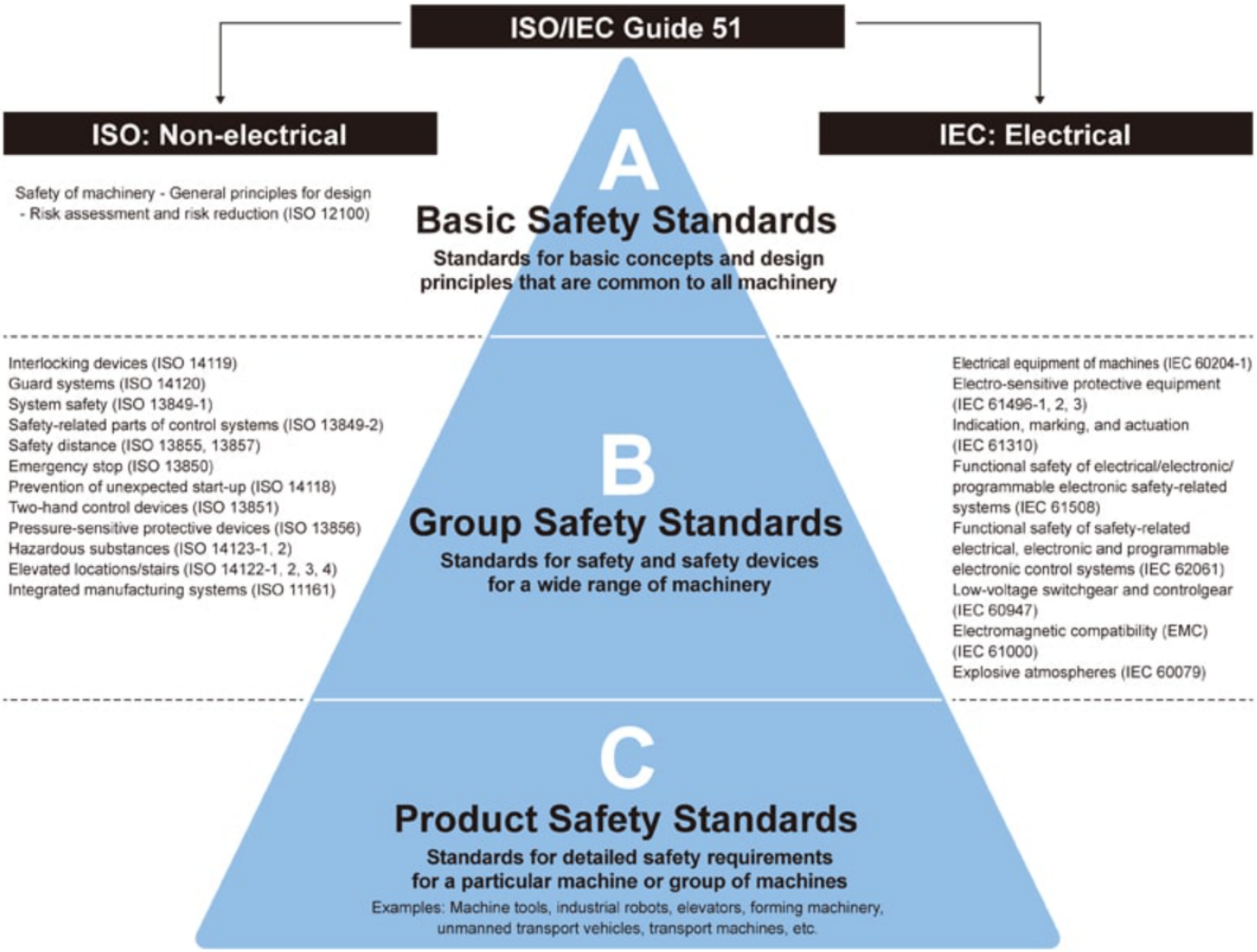
Many engineering societies declare the following engineering ethic:

Engineers, in the fulfillment of their professional duties, shall hold paramount the safety, health, and welfare of the clients, public, and industry.

On one level, safety issues arise when something goes wrong during exploitation of the product, when the product does not perform as it was meant, when the operator does not operate the product as per instructions. On another level, safety issues arise when the wear and tear of the device cause malfunctioning. On a thirds level, safety issues arise when …. Safety is a big topic.

So, besides testing for safety before shipping, the devices and systems must be designed for safety in the first place. And to design for safety, safety must be defined in the technical requirements document.

On this *Link*, you can find a ***System of Safety Standards***. They describe safety on different levels - component, device, and system. Here is a picture from the article. This is worth studying.



Pic. System of Safety Standards
Link

I will go over one simple example on a component level. As we design our systems, we must make sure that the components that we choose satisfy the safety standards. For example, take the Emergency Stop Button, which may be part of our system.



Look for its safety compliance in the datasheet. As I was searching for this device on the web, I could not find the datasheets attached to all of them. But I found the datasheet for the buttons made by EATON. And, it did mention that it is certified accordance with EN ISO 13850 safety standard.

Features

- Certifications in accordance with EN ISO 13850
- Approvals: CE/UL/CSA/CCC
- Tested to DIN EN 60947-5-5
- TÜV Süd approval

So, it becomes important to use components that meet the safety standards mentioned in the technical requirements. Also, we must store all the datasheets of the used components in our design folder. They must be part of the final design document. If something goes wrong during the exploitation of the product in the future, we may have to refer back to these datasheets to stay on the safe side.

This was one simple example on a component level. In the System of Safety Standards, you can find safety standards on the device and system level as well.

How does society ensure that the engineering companies follow the safety standards? In other words, how does it ensure that the engineering companies have a "skin in the game" for safety of its products? It does so, through legal implications. The engineering company is the first responsible entity for the safety of its products and systems. If, *God Forbid*, something really bad happens, the legal implications on the company might be as severe as taking the company straight to bankruptcy, and possibly more.

In ancient Rome, the engineers who designed bridges were asked to sleep under the bridge for a certain period of time to proof that their bridges were safe for use. This is how the ancient Romans made sure that the engineers had a "skin in the game" for the safety of their designs.

This is why, in the Engineering Ethics statement mentioned above, I would also add *Company*:

Engineers, in the fulfillment of their professional duties, shall hold paramount the safety, health, and welfare of the clients, public, industry, and company.

Safety is a big topic. This article touched merely the surface. It is recommended that during the design process, one of the engineers be assigned the role of the "Safety Officer" for that project.

EC News Corner

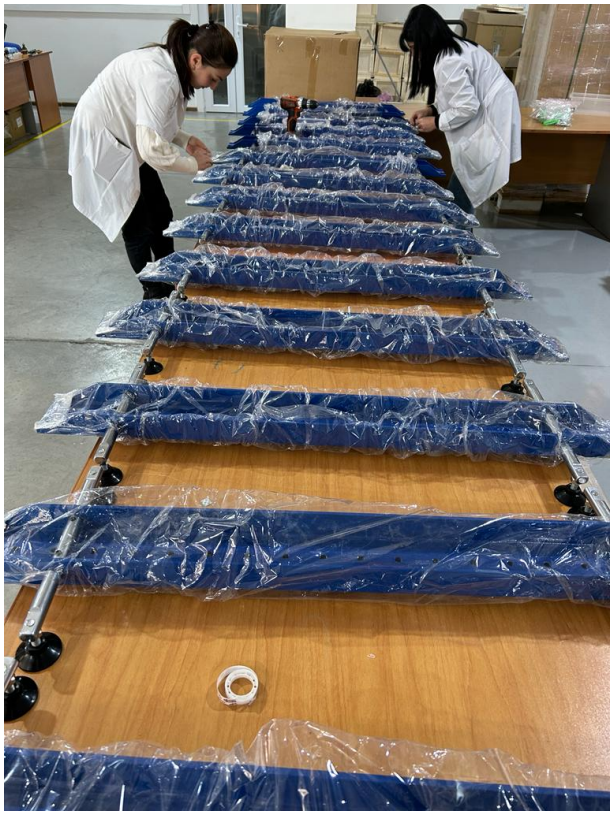
. Volume Production of the "Strength of Materials" Lab by Integrator LLC







1800 mechanical parts were machine-tooled for this production batch.




ATTENTION
ESD PROTECTED AREA



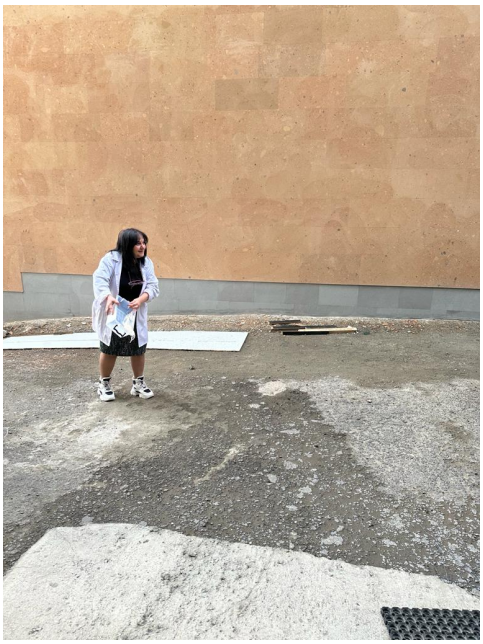








Done!
Manufactured, packaged, boxed, and ready to ship!



Gayane throwing good luck water after the truck that is taking the boxes straight to airport.

Announcements Corner

. Convergence India Expo, January 17 – 19, 2024

The YEAE will kick-off the new year at the Convergence India Expo in Delhi. Any company that wants to show its products at the expo can approach the YEAE as it will be representing all of the Engineering City there.

. ISO 9001-2015 Audit in the EC – End of January, 2024

This is to inform that the ISO 9001-2015 auditor will be at the EC in the last week of January.

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All materials contained in *The Engineering City Journal* may be used with reference to the Authors.

For feedback on the *Journal*, its content, and its articles please send to info@engineeringcity.am.

To submit articles, please send to info@engineeringcity.am. Articles can be in any language.
