

Machine safety technology a hot topic at Health and Safety Canada

TORONTO, Ont. — Health and safety professionals gathered at the Machine Automation Safety Congress (MASC), part of Health and Safety Canada 2009, in Toronto last month to hear about the latest machine safety technologies that are saving limbs and lives. At the “Safety and Technology” panel discussion, Manufacturing AUTOMATION invited leading technology providers to offer insights into how modern tools are making machines safer.

Bill Valedis, the president of Imperial Automation Technologies, and manager of automation systems and training at Precision DBS, discussed PROFIsafe, the first open functional safety communication technology for distributed automation systems. It’s a communication-based technology that uses PROFIBUS or PROFINET, and is based on additional safety layers and protocol.

“Its first implementation was in 1999, so it has a little bit of mileage behind the technology,” explained Valedis. “More than 25 Fortune companies have been involved in participating and throwing muscle behind the technology to get it to where it is today.”

And where exactly is it today? There are currently 500,000 nodes, and that number is growing rapidly. “The technology is moving in a positive direction. We will see in the next little while, in the next few years, an increase in the application of intelligent safety devices,” he said. “We will see definitely wireless safety. We will see safe drive systems. We will see modular safety systems that can be moved from one location to another, and new performance-based standards that marry together with the technology to make a safer development environment.” “We have made a lot of progress and the technology is sound.”

Valedis added that when looking at safety technology, “We have to understand it, we have to embrace it, and it will help us reduce costs in the life cycle of a system.”

But in the end, he said, it’s not just about technology. It’s also important to have the proper procedures in place. “The technology, the devices that we use, [are] important. The application of where we are going to apply that [is important]. But it’s also important to understand that there should be some procedure developed of how specific tasks will be performed. We cannot only rely on the technology just because it’s safe technology. There has to be a protocol of how things get implemented.”

Next, Walter Veugen, the owner of Veugen Integrated Technologies, a manufacturer of stamping press controls and a distributor of associated plant automation products, tackled the on-going progress of the regulatory bodies that are working on harmonizing the Canadian and U.S. power press safety standards.

“What I found out very early on was that we had a real mixture of safety standards within Canada. We had equipment coming in from the U.S. that was built to their standards, equipment coming in from Asia that was built to their standards. European equipment was coming in with their standards,” he explained. “And these are the standards that were specific to how to incorporate all of the devices to come up with the primary guarding and the circuitry—and how to safely run this equipment. There was another group of standards that dealt with all of the specific components. We’re going to buy a light curtain and install it; that light curtain would need to be manufactured in a specific standard. But us as the integration company needed to integrate it into a piece of equipment to another standard. So I think manufacturing as a whole has struggled with that.”

Veugen is one of the members of the ANSI B11.1 committee in the United States, which is developing a standard on heavy power presses. Canada and Europe also have similar standards. “One of the things that became apparent very, very quickly, as we did have a lot of new technology coming out, [is that] if we had to bring an existing piece of stamping equipment up to compliance, we had things like PROFIsafe, we had new light curtain technology, we had laser scanner technology, but none of the safety standards themselves actually referenced how we as integration companies or as owners of equipment could deal with this.”

That is why, explained Veugen, the B11.1 committee chose to look around the world to find out how other countries were dealing with various types of equipment. And, as a group, they integrated safety requirements from other standards into their standard. And today, said Veugen, B11.1 is almost ready to be published.

What does harmonization of these standards mean? “If you’ve got a servo press that’s coming into Ontario, you’re in from the states, if it meets the requirements in the U.S., it’s going to meet the Canadian requirements. Likewise, if you’re dealing with European equipment, it’s also going to have been built to the same standards as well.” “Right now, the EN standards, the ISO standards, the B11 standards and the CSA standards are all trying to work together to harmonize how we approach safety on pieces of equipment.”

Next, Allen Rutherford, a senior applications engineer at Bosch Rexroth Canada, talked about Safe Motion, the

company's integrated safety options for servo controllers.

"When I figured out how this technology works, I was jumping off my chair because I think it's awesome, and it's so good that I wish I had back when I was working in plants," he said.

How does it work? When a machine has automatic moving parts, you need to protect personnel from the movements of these parts on the machine. "If the movement of one of those parts on that machine is going to hurt a human being, then you try and protect the human being from getting hurt," he said. "One of the first things you try to do is eliminate the hazard. And if you can't eliminate the hazard, then try to eliminate the human presence in that hazardous area. Use automation. And what we have is called Safe Motion. Safe Motion is a new mode of the drives and the motors that are moving those parts in that machine. I can program these things in a safe way to eliminate pinch points."

With Safe Motion, the operator doesn't have to kill power to be able to access a machine "an option that isn't always available. Instead, the Safe Motion technology is located inside the drive. "You just connect it over to your safety circuit and it puts the drive into safe mode," explained Rutherford. "And when the drive goes into safe mode, we have a whole set of safe parameters set up in the drive that won't let it go fast, and won't let it go to the pinch points. You can set up some speed limits. If you need to go in and jog that motor, you can set a safe speed, and make sure that it's safe and that speed is safe for people to be within the danger zone. You can specify end limits that are safe so it doesn't crush you up against the side of the machine. You can even have the drive unlock the doors to let you go in once it's safe."

Lastly, John Murphy, the corporate machine guarding and safety manager at Vickers-Warnick, discussed how the application of safety technology has grown from a "single technology approach" to today's integrated approach involving knowledge of safety codes and applying multiple technologies for a single application.

"Instead of having an individual salesman come in or an individual consultant come in and talk to you about light curtains or push buttons or a particular safeguarding device, your safety partner now became a crucial member for your success," he explained. "That person is going to be able to help you solve the problem that you have in one little envelope. You don't have to go to 10 different people to get the solution."

Current safety technologies include control reliable interlocks, control reliable pneumatic valves, control reliable hydraulic valves, control reliable load bearing valves, safety networks, intelligent light curtains, safety PLCs and scanners. And the technologies continue to improve.

"We're developing light curtains today that are becoming intelligent. We have light curtains today that have all of the safety components already in the light curtains. With different components, you can actually identify the motion to travel forward or to travel into the machine or out of the machine," he explained.

Safety PLCs have also come a long way. They've gotten smaller and smarter over the last 10 years, he said.

The main message, said Murphy, is that safety means productivity. "I never talk about downtime with safety. I always talk about uptime. If your machine is safe and in a productive mode, you've got more components going out the door. And what is the bottom line? The bottom line is to make money, to be profitable, stay in business."

Safety also means fewer at-work accidents and lower WSIB costs, he added. "Safety, in my opinion, is an investment. It's not an expense."