School days

Introducing the idea of machine safety to students at the post-secondary level is another challenge that was revealed during the roundtable discussion.

"Within the post-secondary educational system, engineers are not actually trained in safety engineering," explains Doug Nix. "If you go to a fourth year engineering class and [ask], 'What safety training did you get?', they'll say 'We need to remember to wear our safety boots when we're on the site, and our glasses and our hard hats.' You missed the whole picture. All of the stuff that matters about safe design is not even discussed."

Dan Fournier agrees. "I have a neighbour that has a son that is taking electrical engineering. And that discussion between the two of us came up. 'What have they taught you about automation safety,' was my question. And you're right, not a thing. I have a light curtain in my garage for testing purposes, and he didn't know what it was."

Wayne De L'Orme suggests that safety education is also lacking in business schools. "We try many, many times to get health and safety as a management course, even a fraction of an operations course, and we get rebuffed all of the time. I did my MBA at a leading business school in Canada. I took several operations courses, [and] health and safety was not a term mentioned at all. So you get people going out and learning about operations, and health and safety is not even a concept they're considering. So it is a real problem."

Elizabeth Rankin admits that the CSA is trying to work with schools to incorporate machine safety standards into the curriculum, but there are hurdles. "Their educational curriculums are set," she says. "There's not a lot of room for movement. So when you try to get education about standards into the curriculum, you have to get it past, not only the senate of the educational institution, but you also then have to, once they agree to it, deal with the professor and their curriculum…So the efforts are there to try to get it in there, but it's moving very, very slowly."

machine life cycle, possible states of the machine, unintended behaviour of the operator or reasonably foreseeable misuse). The second category is the risk evaluation. This includes risk evaluation of safety design measures, risk evaluation of technical safety measures and all possible instructive measures used. Manufacturers need to be educated on how to use and implement this process into the overall [design of] machine safety."

But once that machine hits the shop floor, the participants agree that assessing the safety of your machinery, and your workplace, is something that should be done daily.

"The operator needs to evaluate the machine every day when he comes to do his job," says Electro-Mag's Jeff Mathyssen. "Is there something worn out that's going to cause an additional risk?"

De L'Orme agrees. "Risk always changes, and the assessment of your risk changes all the time. And one set piece of information is not going to be something that's going to [be] a fail safe for you from the very beginning."

That is why Nix tells his clients that a risk assessment is an ongoing process. "I often have clients ask me at what point are they done with risk assessment, and my answer is always 'Never.' You're never ever done."

"The factory floor is a very, very dynamic place," adds Fournier. "One day we have to have a garbage can beside this machine, and that may create a hazard where someone has to walk around that can and into the path of a forklift. It's constantly changing. So I think that you have to address it daily."

Bolton says that keeping records is key — maintenance records, details related to any changes made to a piece of equipment, and records of your concerns and actions. "Write it down. Keep a record of all of those things," she says. "Records are very important."

De L'Orme agrees. "One of our considerations about whether or not we're going to go ahead with a prosecution is what's the paper record? If the employer has got a good set of documentation saying that they've done all of the steps that they should have done, that's an employer who is not likely to be prosecuted."

Regular risk assessment is also important because often times changes are made to equipment after the initial risk assessment. Lawson has seen this first hand. "There are many times I've seen in industry that it complied at the time of installation, and within three weeks didn't comply because the end user chose to change the safety on the machine to increase production. So it's kind of a dicey area where you go to the point where you deliver something that complies or has a PSR [Pre-Start Health and Safety Review], but then from that point forward, who is making sure that the equipment still complies? That is the onus on the end user."

SAFETY VERSUS PRODUCTIVITY

That belief that safety is a hindrance to production is also a challenge for our experts. Safety is not often the primary consideration when somebody is buying a piece of equipment, says Mathyssen. "The primary consideration is, 'Will it do the job of producing the parts that I need it to produce in this throughput timeline and at this cost? Oh by the way, later on we'll think about making it safe,'" he says. "It's always an afterthought, which is hard and expensive."

Lawson agrees. "It surprises me that employees look at the production rates of the company as more important to them than their personal safety. So I think it's a huge education process that everybody on the floor working in the environment has to want to see the technology on the equipment. Now to get the production rate harmonized with those two things together, that's the job of the automation integrators, the suppliers of the equipment, the solutions people, and it's a hard go because there's a real imbalance between what budgets they realistically have to achieve the safety goals."

To get the right combination of safety and productivity, Mathyssen says that safety has to be designed into the machine. "There are strategies and techniques through automation vendors and everybody else about designing your equipment such that it is compliant to the standards, yet it is giving you the throughput that you need. It's got to come from the front end of the design of the machine," he says. "There are numerous counts of examples of a piece of equipment that was designed safely [that] is providing more throughput because they can stop it faster, they can put it back into service faster, they can clean a mess up, they can do everything that they need to do on that piece of equipment if the safeties are there."

Are we seeing a shift where safety is being considered during the design stage?

"For new machinery, we are seeing more activity from our perspective," says Sauer. "There have been a lot of instances where a Ministry of Labour inspector has come into a plant and has shut machines down. And that hurts the output of that plant because now they're not producing," he explains. "It's falling back onto the onus now of the machine designer for new machines, because they don't want to be in that situation again. They don't want to be shut down. They don't want to be handed the fines that go with unsafe equipment."

He continues: "We have more of our customers being the original equipment manufacturers turning to us as the suppliers of this equipment to assist them in recognizing what risk assessment is, how to calculate risk assessment and how to design that into their machinery."

Sauer gives a recent customer example. "We have a customer that has just come to us with an open statement saying, 'We want you to provide a piece of equipment or a line that will comply to whatever the new standards are, and we don't want an inspector to come and shut us down, so we're putting the ball firmly in your lap.' They're coming to us as the suppliers of this equipment going, 'We don't quite understand this, and we're relying on you to show us.' So there are a lot of questions out there. There needs to be education to the machine builders, to the end users."

Mathyssen is also starting to see this shift. "We're seeing the end users pushing that back to the guy that's building the equipment. They're going, 'Build me a piece of equipment that meets the standards and that I'm not going to get the Ministry of Labour going in [and] saying, You can't use that.'"

ECONOMIC PRESSURES

Costs continue to play a role in whether or not a company will implement safety strategies, and to what extent. "There's a hump that they've got to get over that [if] making that machine run better, faster, safer, is going to cost me X amount of dollars, then maybe I won't do it today," says Mathyssen.

"I think with this economic condition that we've been in the last while, there's a huge pressure for firms to try to get production as cheaply as possible," explains De L'Orme. "I think one of the things that employers sometimes neglect to consider is what is the total cost of the piece of equipment."

Mathyssen says that manufacturers need to look at the whole life cycle of a piece of equipment when evaluating costs. "I think life cycle engineering around a piece of equipment is relatively new to this market, where people are looking at not only as I bought it today, but what's it going to look like in five to 10 years from now," he says.

And there are benefits to the bottom line when you run a safe workplace, explains Bolton. "I think one of the things that you might not really think about that I see from dealing with employers is that employers, in some cases, because of the economic situation, are looking a lot more closely at the WSIB costs. That's becoming a driver perhaps to look at safety, because if they can lower their WSIB costs on an annual basis, then they're saving some money that way. They can do it by implementing new safety scenarios in the workplace, and that actually has a positive economic outcome potentially."

THE BOTTOM LINE

An unsafe workplace will undoubtedly cost more money at the end of the day if there is a workplace accident, a stop work order or a fine resulting from failure to comply. And with the number of convictions on the rise, it's only a matter of time before unsafe activity is caught.

"We've quadrupled the prosecutions over the last four years," says De L'Orme. "We probably will increase on that trend. We're getting more severe about our penalties towards non-compliance. You should be able to guard your machine, and we're starting to get towards the end of our patience towards having to write [stop work] orders to have people guard equipment, because an order only gets people to where they should be at the very beginning."

De L'Orme warns that, "We can prosecute at any time for simple non-compliance. We don't have to write an order, we don't have to say you're not complying with an order. We can come in and say, 'That's not in compliance. We're prosecuting.'"

At the end of the day, the law looks to employers to make sure they're taking all reasonable precautions to keep their employees safe. Education is key. The only way for employers to really understand their responsibilities is to work with the trained professionals — the designers, the manufacturers, the integrators, the safety consultants — to ensure that they have the safest workplace possible. Otherwise, they could have an inspector knocking at their door, or worse.

Go deeper into the discussion by watching our roundtable participants online in our video gallery at www.automationmag.com