

What you need to know about employee safety and machine safeguarding

Contributed by Michelle Morra

When Bill Valedis teaches safety courses, he often tells the story of when he took flying lessons. During one flight, he had the procedures manual between his legs but clearly hadn't properly studied it. After that session, the instructor told Valedis she would never fly with him again. She had put her life in his hands, and he hadn't followed proper procedures.

Flying a plane unprepared is a bit like running a company with a safety program that just sits in a binder and collects dust, or being only vaguely aware of machine guarding requirements.

Valedis is the president of Imperial Automation Technologies Inc., based in Fergus, Ont. He conducts training in pre-start health and safety reviews (PSRs) and has learned, by the questions people ask him, that many manufacturers are unaware of their legal requirements for machine safeguarding. Valedis urges them to learn and to understand that codes, standards and regulations are designed to minimize risk.

"When guys grumble about procedures, saying it's a bunch of bull and pieces of paper, I say, 'No, it's not. It may not be perfect, but we must understand that they exist, what they do, and we must follow them.'"

In other words, legislation can only take us so far. Taking the time to understand and apply it is everyone's responsibility. Just like himself when he was eager to fly but impatient about taking the proper steps, Valedis says companies that neglect their requirements may be putting people's lives at risk.

"We all get buried in having to make production, keeping the bottom line rolling and the product going out the door, but we could all be sitting in a room one day and say, 'Why did this person die?'" says Valedis. "Having sat through department of labour hearings and testified as an expert witness before, I've left all these sessions with a gut-wrenching feeling in my stomach: Why aren't we doing enough?"

Safeguarding requirements

Bill C45 imposes a legal duty on all employers to take measures to protect employee and public safety. There are also regulations for industrial establishments in every jurisdiction's Occupational Health and Safety Act, and manufacturers must comply with any applicable standards that are referenced in the legislation. These may include the Canadian Standards Association's Code for Punch Press, Z142-02, Guarding of Robots, Z434-03, and Guarding of Machinery, Z432-04, depending on the type of machinery in your plant.

When any new piece of equipment is commissioned or started up, the law may require a pre-start health and safety review, depending on the legal jurisdiction and whether or not exemptions apply. In Ontario, this requirement came into effect in 2000 but continues to baffle some employers.

Franco Tomei, guarding specialist with the Industrial Accident Prevention Association (IAPA), gives clients ideas and options to help them comply with safety law. He says that many manufacturers struggle to understand the requirements for safeguarding, especially when the regulations are performance based as opposed to outcome based.

"The question manufacturers often ask is how to comply," says Tomei.

He says that employers voice frustrations with the requirements, and that they are often not sure how far to go in compliance, and where to draw the line.

While the primary objective of machine guarding is to prevent access to the point of operation or exposed moving part, "the reality is that no matter how far you go, there's always somebody who will find a way to gain access," says Tomei. "Often, when I do point out an access point that is to be safeguarded, there is the stunned expression: 'Nobody in their right mind would go in there.' I have to explain that they are absolutely correct, but that the Act and regulations were not intended for those in their right mind."

Nonetheless, even wise, safety-minded employees sometimes get hurt if they don't have adequate safety training. Another objection Tomei hears from employers is that they have responsible, experienced employees who have never had an accident. Experience, however, isn't the same as knowing the hazards and regulatory requirements of a job. In the same vein, a perfect safety record to date "does not in itself constitute safe conditions and is a flawed conclusion," says Tomei.

Mike Voll, controls manager, Manufacturing and Industrial, with Stantec Consulting Ltd., sits on a number of CSA committees. He says the committees continually go over the grey areas that companies have trouble understanding. In creating the standards, he says, "They try to have as little impact on the manufacturers as possible, but there has been a huge impact on manufacturing. When the standards first came out, I think the general view in industry was 'We'll only do

it if we have to,' because it's costly.

"But it is improving your safety level, and potentially reducing your compensation claims, which ultimately could be improving your bottom line. And if you're fined by the government," he adds, "that will impact your productivity as well."

As employers get to know the regulations and codes that apply to their workplace, they should never forget one simple and essential requirement of occupational health and safety law: due diligence. At the most basic level, the law wants proof that employers, supervisors and workers are doing whatever they must to ensure everyone's safety on the plant floor. Keeping that in mind, here's what the law expects of employers:

1. The risk assessment

Conducting a risk assessment is the first thing Voll recommends for anyone considering a safeguarding upgrade. The purpose of this step is to analyse all hazards in the regular operation of the machine, and in setup or changeover functions.

Guidelines recommend that the risk assessment be conducted or orchestrated by the professional engineer who's doing the pre-start health and safety review (if applicable), but Voll says this step should involve all stakeholders, including the equipment manufacturer, operations people, maintenance staff, operators, and health and safety groups within the organization. "What you're essentially doing is agreeing on the level of risk of each of the devices on the system," he says.

The risk assessment explores these and other questions: How does the operator interact with the machine? What are the potential hazards? What's the frequency of the operator's exposure to those hazards? What's the likelihood that something could happen? If something could happen, how severe would it be? Could the operator lose a finger? Could he lose an arm? Is it just a scrape? Is it something that can be treated with first-aid? Is it something that's reversible?

One process and one hazard at a time, conducting a risk assessment gives employers a better understanding of their safety requirements. It might also confirm the need to conduct a pre-start health and safety review.

2. The pre-start health and safety review

This process analyses the safety of each machine or process before it is installed or modified. According to safety regulations, only a registered engineer may conduct the review. Voll, who performs PSRs for various clients, recommends engaging the expert sooner than later, ideally at the machine design stage.

"If the reviewer is not involved early in the process, it can be extremely costly," he says. "We'll end up doing the review on a set of electrical drawings, let's say, for a machine that's already being built, and we'll find a whole series of non-compliances that will effectively flag a redesign. If it had been done earlier it would have saved a lot of money and re-work."

Tomei agrees, saying employers are often shocked to find out that the brand new machine they just bought is not in compliance with safeguarding codes.

"If an unsafe machine is allowed to enter the workplace, it will become an albatross to all those who come into contact with it over its life," he says. "Safeguarding is best integrated at the design stage and not with retrofits."

Too often, Tomei has seen employers take corrective action rather than more prudent preventive action. He says that's like paying for a deficient product, paying somebody else (an engineer) to identify those deficiencies, and then paying yet again to have someone else correct the identified deficiencies.

"I am often shown the approval sticker on machines placed by an authority that has assessed compliance with the electrical code," says Tomei. "And I must point out that this is only for [the] electrical aspect of the machine. It does not indicate compliance with safeguarding requirements."

When buying new equipment, Valedis recommends that employers spell out their guarding requirements, in writing, to equipment suppliers.

"As an employer you'd better have, in your purchasing agreement, requirements for compliance. If an accident occurs, the Ministry of Labour will step in and say, 'Okay, it involves this machine. Who is the manufacturer? Is the machine manufactured to some international standards? What are these standards?'

"They'll do an investigation on you, and as soon as they find out by looking at your purchase order that you don't even specify what regulation XYZ means and how the manufacturer of this machine must comply with your requirement, well you've shown the Ministry or any investigator that you really don't have a safety plan."

3. Equipment installation or upgrade

Once the risk assessment and PSR have been conducted by qualified experts, it is safe to proceed with the new or upgraded equipment and processes. That doesn't mean forgetting all about safeguarding, however. See the sidebar, [Safeguarding compliance](#), for after-implementation compliance tips.

4. Proof of due diligence - safety records and reports

The law requires that companies have all safety documentation on hand. During a safety audit, or in the event that an employer, supervisor or worker must defend himself or herself in a libel suit, safety records and reports will demonstrate that they have practised due diligence and understand their responsibilities.

5. Communication and training

Employees, too, are responsible for safety. They must adhere to safeguarding requirements by always using the safeguards that are in place and following established procedures. That means employers must communicate those procedures to employees and provide the necessary training. And rather than just relying on the generic training by some equipment providers, Valedis says it's important to find a trainer who takes the time to truly understand the company's particular tasks, processes and hazards.

Safety is worth the time

When Valedis goes into a plant where technical staff are well trained in safeguarding and other safety requirements, he senses a certain level of satisfaction, elevated knowledge and less anxiety.

"Sometimes these are very intangible things to put a dollar value on," he says. "Safety is expensive, but it produces results because it informs the people in how to conduct their duties and responsibilities with a lot of confidence. And if you have confidence in what you're doing, you'll do it safer and be more productive because you'll do it in less time."

For additional information on machine safeguarding, which standards you may need to comply with, and a list of circumstances that trigger a pre-start health and safety review, visit www.labour.gov.on.ca, www.csa.ca and www.iapa.ca.

Safeguarding compliance: After implementation

So you've assessed safeguarding risks in your plant, conducted a pre-start health and safety review, and gone ahead with the necessary equipment changes and upgrades. If you've done your homework, your new and improved processes will be not only safer, but they will also be flexible. Expect to make updates or corrections because situations on the plant floor will change.

Manufacturers' responsibilities do not end after implementation. Your Ministry of Labour or safe workplace association are available to help, but remember these tips for starters:

• **Control access to the machine or equipment.** Even after a safeguarding measure is in place, you must provide further protection in the event that someone might not use those machine guards.

"This is an elaborate procedure that states if you are going to bypass a safety device, which is undesirable by every stretch of the imagination but necessary in the world we live in today with the complexity of machines and processes, you must follow this energy control procedure," says Bill Valedis of Imperial Automation Technologies.

"There are stipulations. There is flagging of the particular equipment. There is extra perimeter guarding that goes on. Procedures as to exactly how to prepare the space or the machine before you enter, and a whole host of steps that the employee must follow."

• **When a machine breaks down, be thorough in your corrections.** Franco Tomei, guarding specialist with the Industrial Accident Prevention Association, says when machines are placed back into production after a breakdown, problems sometimes arise. In some cases, he says, the safeguarding will be replaced later as a result of production requirements.

"Too often the safeguards are never really replaced, eventually misplaced and never to be seen again," he says. "Maintenance personnel must, for their own protection, ensure that the repair of the machine is not finished until all aspects (including safeguarding) have been replaced and [are] functioning within specifications."

• **Encourage employee feedback.** As impressive as your safeguarding processes might be, only the employees who use those processes can truly determine how well they work. So talk to them. Give them a means to exchange ideas, and ask them questions such as, "Is there anything about this procedure that we need to modify? Have we run into any difficulty with changing a tool, for example?"

Valedis says, "We need to have a system that updates the information. It must be easy, and it must not be bureaucratic

or take 16,000 pages of paper to fill out."

• Conduct periodic safety audits. Your engineering staff, and perhaps a member of your safety team, should periodically target each area and investigate how things are really working. They should find out how a process works, whether staff are following safeguarding procedures, note any deficiencies and correct them. Valedis says these audits are a logical part of a company's quality assurance program.

Complying with safeguarding requirements, communicating them to employees, and doing the necessary followup and maintenance will make a world of difference in your organization. Investing the time and money for safety will likely make your company prosper more in the long run, both financially and in terms of protecting your workers' limbs and lives.

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