



Excellence Through Education

# Achieving Excellence

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## Control Reliability: What Will It Mean To You?



By Fraser Dimma, P. Eng.

*“Control-reliable safety control systems shall be dual-channel with monitoring and designed, constructed and applied such that any single component failure (including monitoring) shall not prevent the stopping action of the press...” CSA Z142-02 Section 8.1.2*

The topic of Control Reliability - its interpretation and application to safety circuits - is definitely a source of confusion to those in industry attempting to purchase new equipment or upgrade existing machines to the current applicable code.

One reason for this confusion is the fact that there is **no** direct correlation between the North American ANSI and CSA definitions of Control Reliability and the European Standards Categories 0 through 6 for Safety Related Control Systems.

The switches, light curtains, safety relays, and hardware used in our North American safety circuits can be rated and tested using the European standards. However, the test specifications are developed in Europe, and most of the laboratories capable of performing the required tests are located in Europe.

It would have helped if ANSI and CSA had aligned their standards with the European Standards Categories 0 through 4, Safety for Circuit Performance, and had used this in their sections that now refer to Control Reliability.

*Continued on page 3...*

## Welcome Gerry Kelly!

Training Services is pleased to announce the newest member of our team:  
**Gerry Kelly**



Gerry joined Training Services in 2003. A licensed electrician, Gerry has over 15 years experience as an Occupational Health and Safety Coordinator, delivering training and investigative solutions in manufacturing industries. He has extensive hands-on industrial maintenance electrical experience, including O.H.S.A., W.H.M.I.S. and I.S.O. 9000 and 14000 standards. Gerry received W.S.I.B certification and Mediation and Conflict Resolution Training. To contact Gerry, please call (905) 873-3031 or email: [gkelly@cybertrain.on.ca](mailto:gkelly@cybertrain.on.ca) &

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# Ministry of Labour News

**Manroc Developments Inc. fined \$50,000** for a violation of the Occupational Health and Safety Act that resulted in serious injuries to a worker.

On Nov. 23, 2001, a worker was helping to erect a steel beam assembly that was to be used as a support structure for the attachment of rails for a raise climber, when a beam fell and struck him. The worker suffered a broken rib, broken bones in his lower left leg and cuts to his head and neck.

A Ministry of Labour investigation found there was no procedure in place for the installation of the beam assembly. Manroc had been contracted to do this work at David Bell Mine.

Manroc Developments Inc. pleaded guilty, as an employer, to failing to take reasonable precaution of:

- a. Establishing a safe procedure for the installation of the rail support beam,
- b. Setting out this procedure in writing,
- c. Informing workers of this procedure; and
- d. Ensuring the procedure is followed.

Contrary to Section 25(2)(h) of the Act.

**F & D Scene Changes Ltd. fined \$60,000** for a violation of the Occupational Health and Safety Act that resulted in foot injuries to a worker.

On Sept. 16, 200, a carpenter was helping dismantle a background set, when the carpenter walked onto an unsecured elevated area. The area became detached from the supporting

posts causing the carpenter to fall 3.33 metres (11 feet) to a concrete floor below. The worker fractured both heels and suffered ankle injuries. A Ministry of Labour investigation found the worker was not wearing fall arrest equipment at the time, as it had not been provided by the company.

F & D Scene Changes Ltd. pleaded guilty, as an employer, to failing to ensure measures and procedures were carried out, as required by Section 85 of the Industrial Regulations, contrary to Section 25(1)(c) of the Act.

**Cimco Refrigeration fined \$85,000** for a violation of the Occupational Health and Safety Act that resulted in serious arm injuries to a worker.

On Sept. 7, 2002, a worker was brushing debris from a pipe after using a large, high-speed drill press when the worker's work glove got caught in a rotating drill bit resulting in the worker's hand and lower arm being amputated a few inches below the elbow. A Ministry of Labour investigation found the drill press was not equipped with a guarding device to prevent access to the rotating drill bit.

Cimco Refrigeration pleaded guilty, as an employer, to failing to ensure measures and procedures were carried out, as required by Section 24 of the Industrial Regulations, contrary to Section 25(1)(c) of the Act.

**Airways Transit Limited fined \$100,000** for a violation of the Occupational Health and Safety Act that resulted in the death of a worker.

On May 7, 2001, a worker employed

as a van washer, was found dead by a co-worker in a van washing bay. A van was found with its engine running in the wash bay. It was determined that the van washer died of carbon monoxide poisoning. A Ministry of Labour investigation found the wash bay area did not have a mechanical ventilation to prevent the build-up of carbon monoxide or other dangerous gasses from vehicle exhaust.

Airways Transit Service Limited pleaded guilty, as an employer, to failing to take reasonable precaution of:

- a. Ensuring the wash bay area was equipped with a source of mechanical or natural ventilation so the atmosphere did not endanger the health or safety of the workers;
- b. Equipping the wash bay area with a means for a worker to extract carbon monoxide emissions.

Contrary to Section 25(2)(h) of the Act.

## Minister's Action Group Moving Quickly to Strengthen Workplace Health and Safety

Chris Bentley, Ontario Labour Minister, is establishing the Health and Safety Action Group. Starting with construction, it will enlist experts by sector to identify best practices, programs, and policies and then join with employers and workers to implement them swiftly.

The group will begin by examining health and safety in the construction, health, and manufacturing sectors.

*"We need to take action now,"* says Bentley.

Other measures already taken include the hiring of 25 new Workplace Health and Safety Inspectors.

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## Certification: Part Two Training



By Frank St. Pierre

When asked to provide information regarding Certification Part Two Training, many were happy to learn that **Training Services** has been, and is very much involved in the continuing education of Certified Members of the Joint Health and Safety Committee through Part Two Significant Hazard trainings.

As outlined in the W.S.I.B. Guidelines, Certification Part Two focuses on the hazards encountered in the workplace which pose the most significant Health and Safety risks to workers. Certified Members are trained to become part of the solution by working towards the control and/or elimination of hazards in the workplace.

Most workplaces in Ontario must, by law, have a Joint Health and Safety Committee (J.H.S.C.) comprised of management and worker members. One member from each side must have received Basic Certification training. In the recent past, W.S.I.B. has required that these Certified Members undergo additional training in order to assist Ontario employers in resolving workplace issues. This is called Certification Training - Part Two.

*Continued on page 4...*

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## Control Reliability

*...Continued from page 1*

Control Reliability for ANSI and CSA falls somewhere between European Standards Categories 3 and 4. Differences between the ANSI and CSA definitions of Control Reliability add to the confusion. For example, CSA requires monitoring of the monitoring.

The concept of control reliability in safety circuits first appeared and was incorporated in CSA Z142-02. The new CSA Z434-03, Industrial Robots and Robot Systems, clearly requires the use of control reliable safety circuits.

Requirements for control reliability will in the upcoming CSA Z432, General Machine Safeguarding Requirements, may apply to new or redeployed machines only.

All people involved in the design, manufacturing, and use of machines subject to the requirement for control reliability need to understand how it is applied and what is required to comply.

Control Reliability is not restricted to electric circuits: pneumatic and hydraulic circuits are also involved.

For machines requiring control reliable safety circuits (eg: presses, robots, etc.) the application of this requirement is a



**It is easier to establish the control reliability of safety circuits at the design stage, rather than removing and replacing hardware or wiring after the machine is complete and production requirements need to be met.**

fundamental part of the Pre-Start Health and Safety Review required under Section 7 of the Industrial Regulations. Before the equipment can be used, each safety circuit is required to be evaluated by a Professional Engineer and a report issued detailing the measures needed for compliance.

It is easier to establish the control reliability of safety circuits at the design stage, when corrections are a change to the drawing, rather than removing and replacing hardware or wiring after the machine is complete and production requirements need to be met.

To increase your understanding of how all of this applies to various types of manufacturing equipment, we are developing a special course detailing the application of Control Reliability.

This course will be in addition to our regular seminars on various CSA Codes (eg: Z142-02, Z434-03, etc.). Control Reliability will be with us for quite some time and greatly impacts the upgrading of existing equipment to current applicable standards.

For more information, please contact Fraser Dimma at (905) 873-3031 or email: [fdimma@cybertrain.on.ca](mailto:fdimma@cybertrain.on.ca) &

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## Guarding, Lock Out or Procedures?



By John Ford

*A worker sees a problem in the point of operation of his machine. Guarding does not protect the area. He pushes the “power off” button but it does not go in all the way. The machine stops. As he reaches into the machine to correct the problem, the button pops back out. The machine re-starts: a serious injury results.*

**T**here are two basic safety concepts that apply here: **guarding and lock out**. Either would have prevented this accident, but which is it and why weren't either in place? Some would argue this case is a failure to lock out properly. The main electrical disconnect switch should have been turned off, locked, and tagged before the work started. Others would argue a lack of guarding. Access should have been prevented by an interlocked guard that would have held the machine in a safe mode.

Of course, neither solution works all the time. There are many routine and repetitive tasks required for production for which full lock out of all hazardous energy sources is not reasonably practicable. For example, clearing scrap around the die in a hand-fed power press, entry into a robotic cell for 20 seconds to clean a spot weld tip, and trouble-shooting where power is required. Similarly, there are hundreds of machines which cannot practicably be guarded in a way that prevents access. Most wood-working machines like saws, sanders, shapers, and tool and die making machines like lathes, grinders, milling machines cannot be guarded to prevent access. Many printing presses are also typically not equipped with guards that prevent access.

Two initiatives currently underway will determine when it is appropriate to lock out, guard, or use some other procedures to perform any task on a machine. One is a new Canadian Standard Association CSA Z460 Code, which is in development for Hazardous Energy Control. The other is a proposed amendment to Ontario's Machine Guarding Regulations to include Codes of Practice. John Ford is representing the Canadian Federation of Independent Businesses on both initiatives. The flow chart that follows is our prediction of what is to come. →→→→→→→→→

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## Certification: Part Two Training ...Continued from page 3


**T**raining Services can help your team:

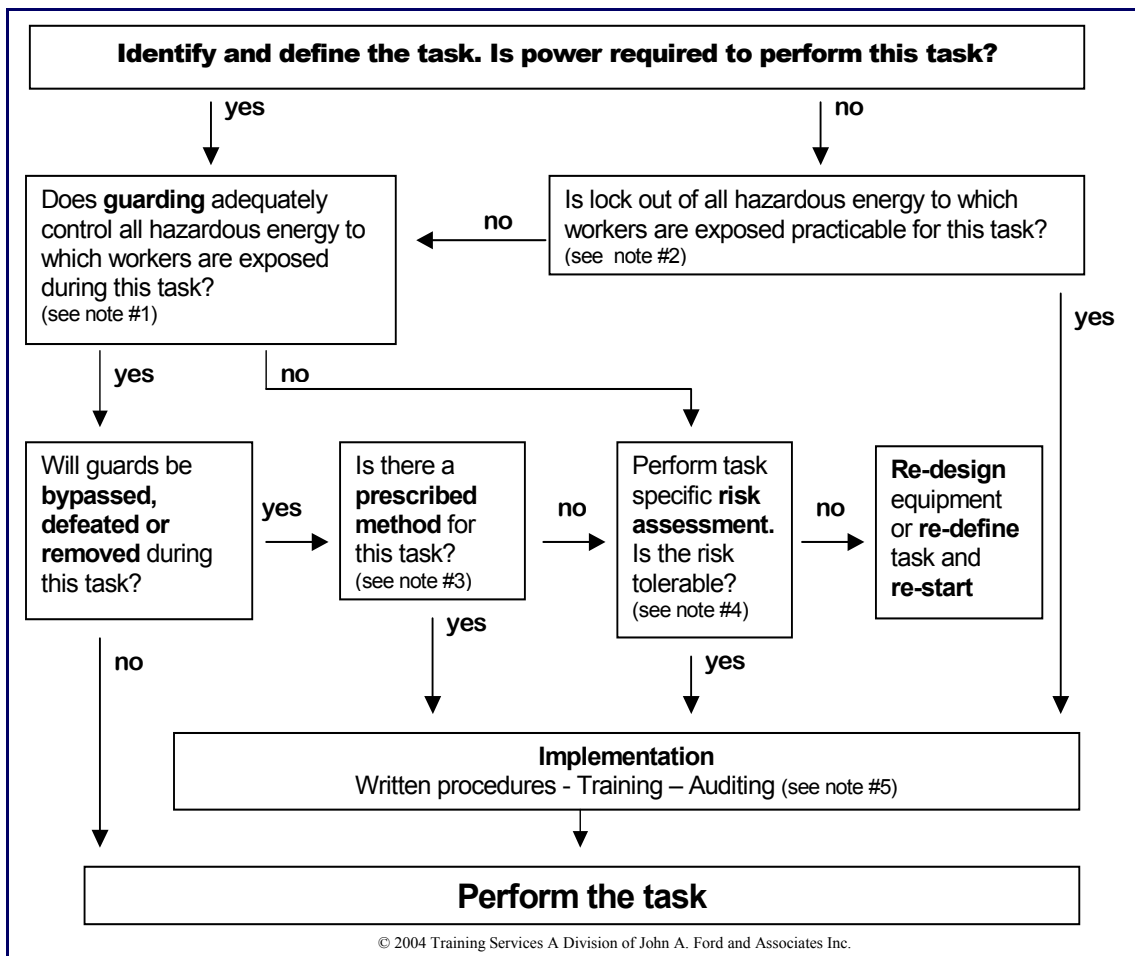
- a. Identify your significant risks by helping conduct a workplace hazard assessment
- b. Determine the significant hazards
- c. Determine your training needs, and
- d. Ensure that at least two designated team members complete this workplace training.

Training will teach your team how to:

- Investigate the hazard and how it can cause injury/illness
- Identify relevant legislation, standards and guidelines
- Determine how to identify and assess the hazard
- Explore ways of controlling the hazard
- Prepare an action plan to identify, assess, and control the hazard

Instead of sending your certified members away for periods of time and incur costs associated with off-site training, we will come to your company and work with your workers, certified members, and others from the J.H.S.C. to complete site-specific training. We will also assist in completing the necessary form to send to W.S.I.B. for the activation of your Part Two status.

For more information, please call Frank St. Pierre (905) 873-3031, or email [fstpierre@cybertrain.on.ca](mailto:fstpierre@cybertrain.on.ca) 



Enclosed you will find a brief survey. Now is the time for your comments to be heard!

Please take a few minutes to complete the survey. As a "thank you", you will receive a copy of the survey summary and will be added to a special mailing list for update information as it becomes available.

**Note #1** For guarding to adequately protect workers, it should be in compliance with the safety standards that are appropriate for that machine. For examples of machine safety standards go to: [www.gov.on.ca/LAB/english/hs/guidelines/prestart/gl\\_psr\\_app1b.html](http://www.gov.on.ca/LAB/english/hs/guidelines/prestart/gl_psr_app1b.html). Ideally, the control circuit integrity would be control reliable or Category 3 or 4 depending on the hazards. Single channel with monitor should be considered a typical minimum requirement.

**Note #2** Lock out is the complete isolation, dissipation, blocking, and or blanking and locking with a personal padlock of the hazardous energy sources at main electrical disconnect switches and valves etc. Tasks where lock out of all hazardous energy is not **practicable** are usually: tasks which are routine, repetitive, and necessary for production; tasks of a short duration, expected to occur frequently and during the normal use of the machine; and tasks done by the machine operator, and do not require extensive disassembly as they are of minor nature.

**Note #3** A **prescribed method** for a task is usually found in a recognized safety standard for the machine. Examples include: safety procedures for teaching a robot (CSA 434-03 or ANSI 15:06); the inch, safe, service method used in the printing industry (ANSI B65.2); and the use of push sticks in the woodworking industry etc.

**Note #4** A task specific **risk assessment** considers the probability of an injury multiplied by the severity of the injury to determine if the risk is "tolerable." The hierarchy of hazard controls applied to reduce the risk to a tolerable level are elimination/substitution, engineering, awareness means, training and procedures and personal protective equipment. For examples of risk assessment methods see CSA 434-03, ANSI 15:06, or ISO 14121, or search on "Machine Risk Assessment."

**Note #5** Written procedures should be machine and task specific and should not be generic. Documented worker training or other qualification should be competency based, i.e. theory training and testing, and practical training and testing. Ongoing auditing should be documented to ensure compliance and provide proof of managements' due diligence.

For more information please contact John Ford at (905) 873-3031, email: [jford@cybertrain.on.ca](mailto:jford@cybertrain.on.ca) &



I broke a mirror in my house.

I am supposed to get 7 years of bad luck, but my lawyer thinks he can get me 5!



“Middle age is when you're cautioned to slow down by the doctor instead of by the Police”



## You Might be an Engineer If...

- Buying flowers for your girlfriend or spending the money to upgrade your RAM is a moral dilemma.
- Everyone else on the Alaskan Cruise is on deck peering at the scenery, and you are still on a personal tour of the engine room.
- The salespeople at Radio Shack can't answer any of your questions.
- You comment to your wife that her straight hair is nice and parallel.
- You saved the power cord from a broken appliance.
- You know what http:// stands for.
- You spent more on your calculator than you did on your wedding ring.
- You still own a slide rule and you know how to use it.
- Your laptop computer costs more than your car.
- You've ever tried to repair a \$5 radio.

**I spilled spot remover on my dog and now he's gone.**

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## **Signs You Have Nothing To Do At Work**

**You have developed Repetitive Stress Disorder from playing Solitaire**

**You've actually figured out a way to get Gilligan off the island**

**People only come to your office to borrow pencils from the ceiling**

**In an effort to exercise your creative side you knit a computer cozy**

**You discover that staring at your cubicle wall long enough produces images of Elvis**

**The 4th Division of Paper Clips has overrun the Push Pin Infantry and General White-Out has called for a new skirmish**



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