

	<p><b>CSA Z432</b></p>	
	<p><b>OHS Reg.</b></p>	

Safeguarding

Ian Rood – UB Safe  
(778) 847-4047

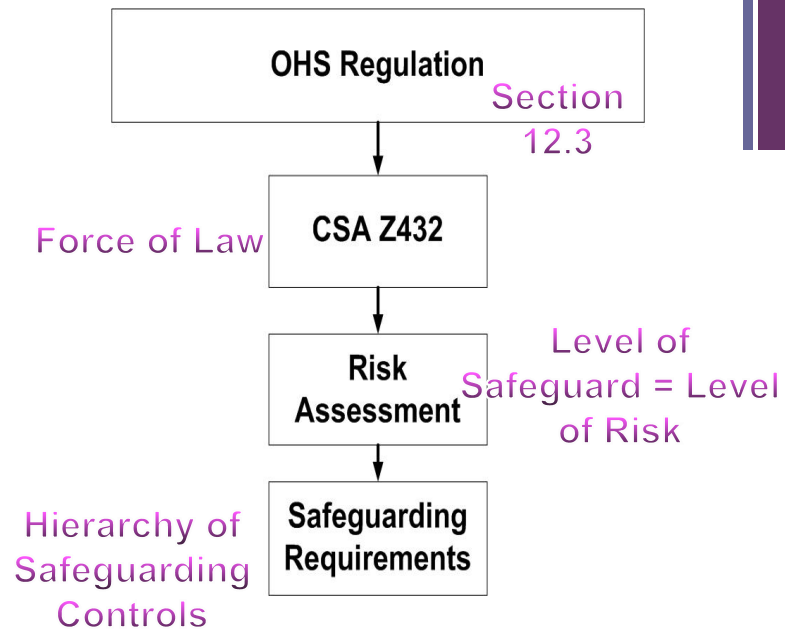
+ Part 1 – Safeguarding,  
Requirement

## + Introduction

### ■ Question:

Are the CSA Standards 'better' than the OHS Regulation?

## +



## + Safeguarding Requirement – Section 12.2 of the OHS Regulation

- ... the employer must ensure that machinery and equipment is fitted with adequate safeguards which
  - (a) protect a worker from **contact with hazardous power transmission parts**,
  - (b) ensure that a worker **cannot access a hazardous point of operation**, and
  - (c) safely contain any **material ejected by the work process** which could be hazardous to a worker.

## + Section 12.3 of the OHS Regulation

- The application, design, construction and use of safeguards, including an opening in a guard and the reach distance to a hazardous part, must meet the requirements of *CSA Standard Z432-94, Safeguarding of Machinery*.

*[Enacted by B.C. Reg. 312/2003, effective October 29, 2003.]*

\* See also section [4.4 of the OHS Regulation](#).

## + Safeguarding, Lockout and CSID's

### ■ BUZZ GROUP EXERCISE

With the people at your table, discuss this question:

***What is Safeguarding? What is Lockout?***

## + Safety in the Larger Context

Safety around machinery & equipment

### Safeguarding



Protects workers when machinery or equipment is in operation

(See OHSR Part 12)

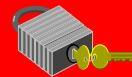
### Instruction Training Supervision



Needed for all aspects of equipment operation and maintenance

(See WC Act S. 115-117)

### Lockout



Protects workers when machinery or equipment is shut down for maintenance

(See OHSR Part 10)

+ Part 2 – Safeguard vs.  
Lockout.....CSID's??

+ Activities

■ BUZZ GROUP EXERCISE

With the people at your table, discuss  
this question:

***What is the difference between  
Production and Maintenance  
Activities?***

## + Maintenance Work

Section 10.3 of the OHS Regulation requires zero energy lockout for maintenance activities.

*"maintenance" means work performed to keep machinery or equipment in a safe operating condition, including installing, repairing, cleaning, lubricating and the clearing of obstructions to the normal flow of material;*

## + Lockout required for Production Work

Section 10.3 further requires that if there are not adequate safeguards where a hazard exists, lockout is required for normal production activities.

*"normal production" means work that is routine, repetitive, and integral to the normal use of machinery or equipment for production*

+ Mead Machine



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## + Safeguarding Requirement – Section 12.2 of the OHS Regulation

- ... the employer must ensure that machinery and equipment is fitted with adequate safeguards which
  - (a) protect a worker from **contact with hazardous power transmission parts**,
  - (b) ensure that a worker **cannot access a hazardous point of operation**, and
  - (c) safely contain any **material ejected by the work process** which could be hazardous to a worker.

## + Part 3 – Risk Assessment

## + Step 1 – Risk Assessment

### Minimum requirement – 2D Model

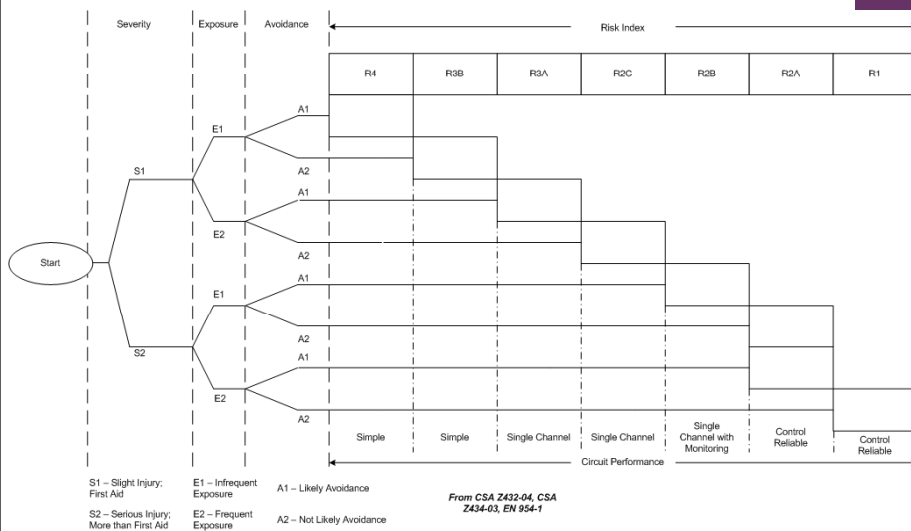
Risk level =

Severity of Injury x Likelihood of Injury

- Excellent example of this method in Appendix 1 of WorkSafeBC publication ‘Safeguarding of Machinery and Equipment: General Requirements’

## + Risk Assessment Method – Z432-04

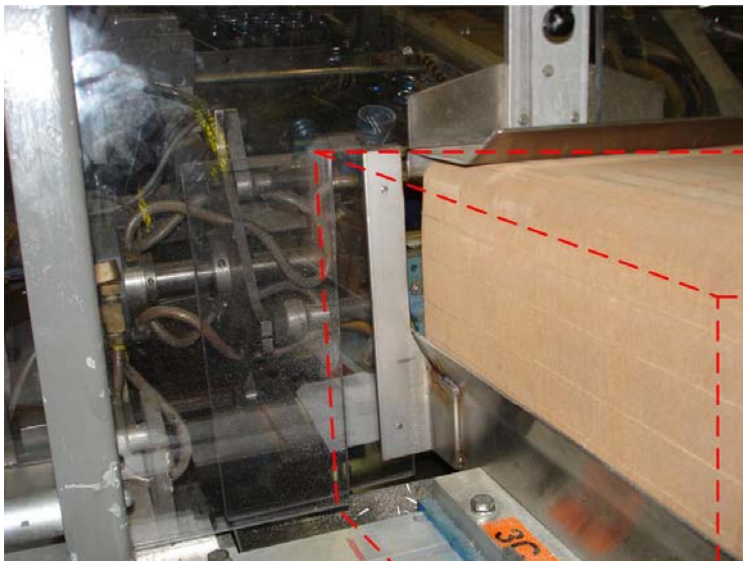
\* Prior to Safeguards\*



+ Mead Machine



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**Table 1**  
**Hierarchy of safeguarding controls**  
(See Clause 5.2.3.)

<div style="border: 1px solid black; padding: 2px; text-align: center;">Most effective</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">↓</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">Least effective</div>	1. Elimination or substitution	<ul style="list-style-type: none"> <li>eliminate human interaction in the process</li> <li>eliminate pinch points (increase clearance)</li> <li>automated material handling</li> </ul>
	2. Engineering controls (safeguarding technology)	<ul style="list-style-type: none"> <li>mechanical hard stops</li> <li>barriers</li> <li>interlocks</li> <li>presence-sensing devices</li> <li>two-hand controls</li> </ul>
	3. Awareness means	<ul style="list-style-type: none"> <li>lights, beacons, and strobes</li> <li>computer warnings</li> <li>signs</li> <li>restricted space painted on floor</li> <li>beepers</li> <li>horns</li> <li>labels</li> </ul>
	4. Training and procedures (administrative controls)	<ul style="list-style-type: none"> <li>safe job procedures</li> <li>safety equipment inspections</li> <li>training</li> <li>lockout</li> </ul>
	5. Personal protective equipment	<ul style="list-style-type: none"> <li>safety glasses</li> <li>ear plugs</li> <li>face shields</li> <li>gloves</li> </ul>

**Safeguard Selection Matrix**

Index	Safeguard Performance	Safety Controls Performance
RI	Hazard Elimination or Hazard Substitution	Control Reliable
REA	Engineering controls preventing access to the hazard, or stopping the hazard, e.g. interlocked barrier guards, light curtains, safety mats or other presence-sensing devices.	Control Reliable
REB		Single Channel with monitoring
REC		Single Channel
REA	Non-interlocked barriers, cones, procedures and equipment	Single Channel
REB		Simple
RI	Awareness Means	Simple

## + Solutions

### ■ BUZZ GROUP EXERCISE

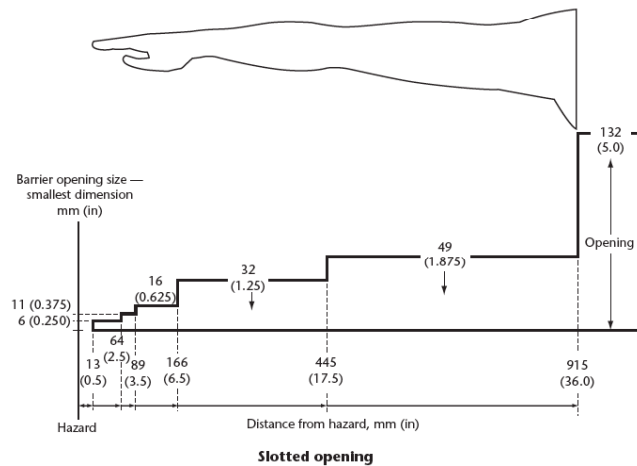
With the people at your table, discuss Solutions to the Mead Machine dilemma.

***Remember the Hierarchy of Safeguarding Controls.....***

## + Table 3 of CSA Z432-04 – Minimum distance by barrier opening size

Z432-04

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## + Validation – consider the safeguards

### 2.5 Validation Method (After Safeguards / Modifications)

Exposure	Avoidance	Severity of Injury	RIS Index
E6 Frequent Exposure	A2 Not likely	S2 Serious Injury	R3
		S1 Slight Injury	R2C
	A: Likely	S2 Serious Injury	R2A
		S1 Slight Injury	R2A
E1 Infrequent Exposure	A2 Not likely	S2 Serious Injury	R2A
		S1 Slight Injury	R3B
	A: Likely	S2 Serious Injury	R2A
		S1 Slight Injury	R1

- Target Risk index after modifications / installation of safeguards is R3 or R4.

## + Where do I learn what Control Reliability means.....?

1. Purchase a copy of the CSA standard
2. CSA standards are available online to view only (free) through the CSA website
3. FIOSA provide a two day technical course on safeguarding design and risk assessment
4. Manufacturer's documentation



Ian Rood – (778) 847-4047  
ianrood@telus.net

- Risk Assessment Evaluations and Training
- Design Consultation or Turnkey Solutions
- PESR – Professional Engineer’s Stamped report on compliance of safeguards to the applicable CSA standards
- Preparation of Approval package for WorkSafeBC review
- 20 Years experience through the evolution of safeguarding in Ontario's Automotive Industry
- Actively involved locally, and nationally with CSA Standard development, CSSE, and other safety organizations