

INDUSTRIAL GUARDING PROGRAM

ENERGY SOURCES, MACHINERY, EQUIPMENT AND MATERIALS

STANDARD

To have an industrial guarding program that includes workplace hazard assessments, visible compliance with current legislation and relevant training for everyone involved.

INTRODUCTION

A guarding program should be developed and implemented to ensure that workers have no access to energy sources, moving parts, pinch points, in-running nip hazards, materials, waste stock or other hazards that might endanger the worker while machinery is in motion or capable of being set in motion.

All guarding should comply with:

- Regulation 851 Industrial Establishments, specifically Sections 7, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35...to Section 44.2

Furthermore, the program should assign responsibility, grant authority and include accountability to ensure that:

- All hazards associated with moving parts, energy sources or materials in, on or around machinery and equipment are identified and assessed;
- Temporary measures and safeguards adequate to protect workers are adopted until permanent solutions are implemented;
- Existing machines and equipment are retrofitted in compliance with this standard;
- New machines and equipment are designed, constructed and installed or modified in accordance with current legislation;
- Appropriate personnel receive adequate training, depending on the nature of their duties, to identify hazardous situations involving moving machinery and materials, to design and construct, install and maintain guards or other protective devices in accordance with this standard.

BACKGROUND INFORMATION

The standards discussed in this module arise from the need to protect workers exposed to the possibility of contact with energy sources, moving machinery, equipment or materials. In the past, machinery and equipment were often designed, constructed and installed with little thought to the protection of workers. Over time, manufacturers began to incorporate safety features into the design and construction of their products. Employers demanded safer equipment because of an increased awareness of equipment hazards. Workers' compensation systems pushed for lower incident rates to reduce costs and occupational health & safety legislation was passed to satisfy the public demand for safer workplaces.

All sorts of machinery and equipment with different design features are found today in industry. Some are built in-house, while others might be older equipment manufactured with little or no safety features. There are also modern, state-of-the-art computerized and automated machines and equipment with comprehensive safety features. This is significant because of the inconsistency with which machines are presently safeguarded.

Another problem facing industry is the focus of enforcement. In Ontario, the onus for providing machinery and equipment that are safe falls largely on the employer, especially when it comes to ensuring the proper design, construction, installation and maintenance of machinery and equipment. This means that manufacturers, often based abroad (USA and EU), are under no legal obligation to design and build equipment that is “safe” or that meets Ontario’s Occupational Health and Safety Act and Regulations for Industrial Establishments. Simply put, the current situation calls for the “buyer to beware”. An employer who is committed to the practice of due diligence in the protection of workers will ensure through policies and procedures that all machines and equipment, whether new or used, are guarded and maintained in accordance with current legislation and industry best practices.

APPLICABLE LEGISLATION

Legislated guarding and related requirements can be found in the Revised Regulation 851 Industrial Establishments, made under the Ontario Occupational Health and Safety Act, specifically:

Section	The section describes the requirement for:
7	Pre-Start Reviews (under Item 2 of the Table) dealing with safeguarding modifications
13 & 14	Guardrails, mid rails & toe-boards
15	Covering holes in the floor
24	Guarding exposed moving parts
25	Guarding pinch points
26	Shielding workers against flying debris from machine
27	Emergency stop controls
28	Operating controls that act as a safeguard
29 & 30	Guarding for grinding wheels
33	Start-up warning alarm for conveyors, machines with moving parts out of view
34 & 35	Guarding underneath conveyors
36 - 38	Nailing gun - safety and guarding requirements
39	Chainsaw - safety and guarding requirements
40 – 42.1	Electrical installations & equipment - safety and guarding requirements
43 – 44.2	Portable electrical tools – safety and guarding requirements

METHODS OF GUARDING

There are a number of distinct approaches to industrial safeguarding. Usually, first consideration is given to guarding in its traditional sense where a physical barrier of some sort is used to prevent access to the hazard in question or the wider “danger zone”. That is the preferable method. However, where it is impossible to apply a physical barrier, a variety of options are available. Here are the common methods of safeguarding:

Physical Guards	This category includes fixed guards, interlocking guards, automatic guards, adjustable guards and self-adjusting guards.
Guarding Devices	This category includes presence-sensing devices (photoelectric, radiofrequency and electromechanical), electronic interlock, pullback devices, holdback devices, safety controls (safety trip controls, two-hand controls and two-hand trips).
Safety Gates	Interlocked or otherwise to prevent entry into a danger zone while machinery and materials are in motion.
Location/Distance	Using the location of a device, its distance from access ways, or the use of barriers (e.g. perimeter fencing) as a means to isolate workers from hazards.
Guardrails	Use of guardrails to prevent workers from falling to a lower level or onto hazardous machinery or other hazards.
Automatic or semi-automatic feed and ejection systems	System and process automation as a means of improving worker safety by eliminating the need for the physical presence of a worker.

IMPLEMENTATION Q & A

Should workers receive training related to guarding?

Yes. According to the Occupational Health & Safety Act, employers must provide appropriate training to employees to protect their health and safety. This training should include advising workers not to use or operate a piece of equipment that has a sub-standard or missing guarding device for fixed guards, whom to report the problem to, and procedures to follow prior to removing guards. More specific training might be required for more complex guards (e.g. interlocking device). Some companies train their employees on these issues during worker orientation and also include information on all applicable safe operating procedures, as well as lockout procedures. OFSWA’s Safety Meeting Topic on machine guarding could also be of assistance when delivering this training.

We like to build our own guards internally. How can we train our maintenance staff?

A large number of companies prefer to build guards themselves. OFSWA has developed a machine guarding training program, designed to assist maintenance workers, supervisors and JHSC members who must assess, build, install and monitor fixed guards that meet current legislation and industry best practices. Additional resources include the booklet, Safe Methods for Fixed Machine Guards in Forest Industries, a poster and a measurement gauge to help ensure compliance.

I have an existing guard that I would like to upgrade. Are there any special requirements to follow?

Depending on the type of guard being changed or upgraded, a pre-start health and safety review might have to be conducted. The MOL’s “Guidelines for Pre-Start Health and Safety Reviews: How to apply section 7 of the Regulation for Industrial Establishments – April 2001” is a useful guide that could provide valuable information. You can also contact your local Consultant Trainer or MOL office for further assistance.

We conducted a guarding assessment of our workplace a few years ago. Why conduct another one?

The MOL is greatly increasing its enforcement in relation to inadequate guarding. Guarding infractions are one of the most commonly issued orders because of the seriousness of injuries associated with inadequate guarding. Fines have been levied against companies that had an excellent health and safety program but did not have all machinery effectively guarded. Recent court cases have clearly indicated a higher expectation for safeguarding.

We have a piece of equipment we can't seem to guard. Where can we find help with this problem?

Even though some areas will seem impossible to guard, the Regulation for Industrial Establishments states that all exposed moving parts must be guarded if they pose a hazard to a worker. Manufacturers can provide assistance in meeting the intent of the law since they are now incorporating advanced engineering controls into the pieces of equipment that they sell. It is recommended that the expertise found within your workplace be utilized when installing new guards or upgrading existing ones. Workers, supervisors, maintenance personnel and the JHSC are all excellent resources. You can also contact your local MOL office for further assistance.

DUTIES AND RESPONSIBILITIES

This section helps identify the key elements of a good guarding program that should then be re-written into a formal company policy. Fill in the blanks with the appropriate information to answer the question posed. The underlined heading of each section poses the main question.

WHO WILL (including WHEN or HOW OFTEN)

- 1) Develop a guarding program to meet this standard (including the possible need for Pre-Start Reviews) _____ and when _____?
- 2) Assess the need for a pre-start review, _____?
- 3) Revise/develop safe operating procedures and lockout procedures to include guarding hazards _____?
- 4) Ensure that workers receive training/orientation to understand guarding hazards, including how to properly lock out equipment and remove a guard _____?
- 5) Assess the workplace for guarding deficiencies _____ and when _____?
- 6) Ensure that guards are constructed to accepted standards _____?
- 7) Follow up on the effectiveness of newly installed safeguarding _____ and when _____?

WHAT (including WHEN and HOW OFTEN)

- 1) Type of training will every worker get _____
and how often _____?
- 2) Type of training will those responsible for constructing/implementing new guards
get _____ and when _____?
- 3) Guarding standards will be followed _____
_____?

HOW

- 1) Will the guarding assessment be done _____
_____?

OUTCOME

A summary of certification requirements to assist you in the development of this program:

- To have an industrial safeguarding program that assigns and describes responsibilities, presents the standards that guarding shall meet, and the type, time and frequency of orientation and training.
- That all associated workers receive documented orientation on general and job-specific guarding requirements, hazards and controls, including how to address the removal of a safeguard if necessary (e.g. lockout) and can demonstrate knowledge. (*Job-specific guarding requirements should be included in safe operating procedures.*)
- That all maintenance staff, supervisors and JHSC members receive advanced industrial guarding training in order to recognize hazards, make recommendations and implement proper controls.
- That an assessment of current guarding throughout the entire workplace be performed and the findings be documented.
- That the industrial guarding program adopt the Canadian Standards Association's standard CSA Z432-94 "Safeguarding of Machinery" as a minimum for all guards where applicable and that all machines, equipment, devices and things be guarded in accordance with that standard and the legislation.
- That regular inspection and follow-up be conducted as a way of ensuring on-going compliance.
- That all new or modified machines, equipment, devices and things be subjected to a pre-use assessment to ensure that they comply with the requirements outlined in this module.

APPENDIX

INDUSTRIAL GUARDING PROGRAM

A. REFERENCES AND RESOURCES

APPENDIX A

REFERENCES AND RESOURCES

CSA Standard Z432-94, Safeguarding of Machinery

50 pages (1994), ISSN 0317-5669; \$70

Website: <http://www.csa-intl.org/onlinestore/GetCatalogItemDetails.asp?mat=000000000002004839>

(Has references to other related standards)

Safe Methods for Fixed Machine Guards in Forest Industries

24 pages (2002)

Ontario Forestry Safe Workplace Association

Website: <http://www.ofswa.on.ca>

Safety Meeting Topic: A self-guided training and information package on machine guarding for sawmills and board mills

31 pages (2000)

Ontario Forestry Safe Workplace Association

Website: www.ofswa.on.ca

Measurement Gauge

Tool designed to assist in determining the acceptable size of an opening in a guard. (2002)

Ontario Forestry Safe Workplace Association:

Website: www.ofswa.on.ca

Machine Guarding Handbook: A Practical Guide to OSHA Compliance and Injury Prevention

106 pages (1999), ISBN: 0-86587-662-2 (PC #662) \$75

Website: <http://www.govinst.com/pubscatalog/products/662.html>

Concepts and Techniques of Machine Safeguarding

87 pages (1992), ISBN 0-16-037972-5

Website: <http://www.osha.gov/Publications/osha3067.pdf>

Ministry of Labour Announcements & Alerts

(Includes cases in which Ontario guarding requirements are interpreted)

Website: <http://www.oshforeveryone.org/wsib/external/www.gov.on.ca/LAB/ohs/i23e.htm>

A Guide to Practical Machine Guarding

25 pages (2002)

Queensland Government, Australia

Website: <http://www.whs.qld.gov.au/guide/gde01v1.pdf>

Guidelines for Pre-Start H&S Reviews: How to Apply Section 7 of the Industrial Regulations

38 pages (2001)

Ontario Ministry of Labour

Website: http://www.gov.on.ca/LAB/ohs/g_psre.pdf