

# Machine Guarding Policy



While there are a few technical variances, basic machine guarding requirements are fairly uniform across Canada. This while this Model Policy is based on BC OHS regulations, it can be easily adapted for any other jurisdiction.

## 1. PURPOSE

ABC Company has adopted this Policy to prevent amputation, crushing, electrocution, and other injuries to personnel operating or working on, with, or near machinery or equipment in accordance with the [province name] *Occupational Health and Safety Regulation* ("Regulation"), *Occupational Health & Safety Act* ("Act"), the ABC Company Occupational Health and Safety Program ("OHS Program"), and other applicable requirements and standards.

## 2. DEFINITIONS

For purposes of this Policy:

- **"Board"** means the BC Workers' Compensation Board (aka WorkSafeBC);
- **"Guard"** means a type of safeguard consisting of a physical barrier that prevents a worker from reaching over, under, around, or through the barrier to a moving part or point of operation;
- **"Mobile equipment"** means a wheeled or tracked vehicle that is engine or motor powered, together with attached or towed equipment—but not a vehicle operated on fixed rails or tracks;

- **“Point of operation”** means the danger area in a machine where a part is being formed or work is being done;
- **“Power transmission part”** means any moving part of a machine that transfers power from a power source to a point of operation;
- **“Practicable”** means that which is reasonably capable of being done;
- **“Qualified”** means being knowledgeable of the work, the hazards involved, and the means to control them by reason of education, training, and/or experience;
- **“Safeguard”** means the use of a guard, safety device, shield, awareness barrier, warning signs, or other appropriate means, either singly or in combination, to effectively protect workers from hazards;
- **“Safety device”** means a type of safeguard consisting of an arrangement of operating controls, an active or passive physical restraint, an interlock, or a presence sensing device that ensures that a worker cannot access or be in a hazardous area while a machine is operating;
- **“Shield”** means a type of safeguard consisting of a physical cover or barrier that restricts but does not prevent access to a hazardous moving part or point of operation.

### **3. POLICY STATEMENT**

ABC Company recognizes that workers who make contact with or become entangled in machinery or the moving parts of machinery are at risk of suffering fatal injuries, amputations, and other gruesome injuries and will take all reasonable measures to prevent this by ensuring that machinery is properly safeguarded in accordance with the Regulation and this Policy.

### **4. SCOPE**

#### **4.1. Workers This Policy Is Intended to Protect**

The intent of this Policy is to ensure that **all workers** engaged to work at ABC Company work sites who are at risk of

machine injuries are properly protected regardless of who pays or employs those workers, including:

- Full- or part-time workers employed by ABC Company;
- Temporary employees placed by an outside agency to work at the site;
- Contract labourers engaged to perform work at the site;
- Volunteers who work at the site for free; and
- Workers employed by prime contractors, contractors, and subcontractors to perform work at the site under a contract with ABC Company.

#### **4.2. What This Policy Does Cover**

This Policy establishes **general** requirements for safeguarding machinery.

#### **4.3. What This Policy Does Not Cover**

The actual technical devices, methods, and systems of guarding or safeguarding specific machines or pieces of equipment found at the workplace are **not** set out in this Policy but rather will be developed and implemented in accordance with the principles set out in this Policy based on the particular type of machinery or equipment involved and the manufacturer's specifications.

The performing of maintenance work on machinery requiring de-energization and lockout is addressed not in this Policy but instead the ABC Company Lockout and De-Energization Policy.

Nor is this Policy intended to cover portable powered tools and mobile equipment which, to the extent used, will be addressed in separate safety policies.

### **5. SAFEGUARDING OF MACHINERY**

#### **5.1. When ABC Company Will Provide Safeguards**

Subject to the exceptions required or permitted by the

Regulation and the OHS Program, ABC Company will ensure that machinery and equipment is fitted with adequate safeguards that:

- Protect workers from contact with hazardous power transmission parts;
- Ensure that workers cannot access a hazardous point of operation; and
- Safely contain any material ejected by the work process that could be hazardous to workers.

## **5.2. Minimum Standards for Safeguards**

ABC Company will ensure that safeguards:

- Are applied, designed, constructed, and used, including with respect an opening in a guard and the reach distance to a hazardous part, in a way that meets the requirements of CSA Z432-94, Safeguarding of Machinery;
- Are capable of effectively performing their intended functions; and
- Are designed, where practicable, to allow lubrication and maintenance without having to remove the guard.

## **5.3. Ban on Certain Fixed Guard Modifications**

ABC Company will ensure that fixed guards are not modified to be readily removable without the use of tools.

## **5.4. Removal of Unsafe Machines & Equipment**

ABC Company will ensure that any machine or piece of equipment that is unsafe is removed from service and identified in a way to ensure that nobody inadvertently returns it to service unless and until it has been made safe for use.

## **5.5. Other Safeguarding & Safety Measures**

ABC Company will also ensure that:

- Machines are located or safeguarded so that operation of the machine does not endanger workers who move through the workplace using normal passage routes or operate adjacent machines;
- Physical hazards are marked in a way that clearly and effectively lets affected workers know about the hazard.

## **6. OPERATING CONTROLS**

ABC Company will ensure that powered equipment (other than portable powered tools or mobile equipment, which is not covered by this Policy) has:

- Starting and stopping controls located within easy reach of the operator;
- Controls and switches clearly identified to indicate their functions;
- Controls positioned, designed, or shielded as necessary to prevent inadvertent activation;
- If two-hand controls are installed, controls designed to require concurrent use of both hands to operate the equipment, and to require both controls to be released before another machine cycle can begin; and
- Control systems meeting the requirements of the Regulation.

## **7. GUARDING OF MECHANICAL POWER TRANSMISSION PARTS**

### **7.1. Guarding of Rotating Parts**

ABC Company will ensure that rotating parts that workers may make contact with, such as friction drives, shafts, couplings and collars, set screws and bolts, keys and keyways, and projecting shaft ends, are guarded.

### **7.2. Guarding of Gears & Sprockets**

ABC Company will ensure that:

- Where practicable, every gear and chain sprocket is

completely enclosed; or

- Where complete enclosure is not practicable, that the gear and chain sprocket has band-type guards with flanges that extend below the root of the teeth;
- Rotating spokes that pose a hazard to workers are guarded on the sides that are accessible to workers.

### **7.3. Guarding of Reciprocating Machinery**

ABC Company will ensure that a crank, tail rod, extension piston rod, or other reciprocating or oscillating part that a worker may make contact with is guarded.

### **7.4. Guarding of Drive Belts**

ABC Company will ensure that:

- A power transmission belt, rope, or chain is guarded to protect workers who would be endangered if the belt, rope, or chain were to fail;
- The in-running nip point of a power transmission belt, or chain, and any portion of a flywheel or pulley located within 2.5 m (8 ft) above a floor, walkway, or platform is guarded to prevent worker contact;
  - Exception: The bullet immediately above does not apply to the unguarded parts of an installation that was in place before Jan. 1, 1999 if those unguarded parts are more than 2.1 m (7 ft) but less than 2.5 m (8 ft) above the floor, walkway, or platform, which may remain unguarded:
    - Unless the work process poses an undue risk to workers because those parts are unguarded; or
    - Until such time as the installation is substantially overhauled or renovated.

## **7.5. Guarding of Flywheels & Pulleys**

ABC Company will ensure that:

- A pit for a flywheel or pulley has curbs or toeboards around the pit's upper edge;
- A flywheel or pulley that is defective or exposed to excessive heat is removed from service and not returned to service unless and until it is either:
  - Repaired according to the manufacturer's specifications; or
  - Certified safe for use by a professional engineer.

## **8. CONVEYORS**

### **8.1. General Safety Standards for Conveyor Equipment**

Unless the Regulation permits otherwise, ABC Company will ensure that a conveyor meets the requirements of ANSI/ASME B20.1-1993, *Safety Standards for Conveyors and Related Equipment*.

### **8.2. Guarding of Belt-Type Conveyors**

ABC Company will ensure that the accessible nip points of spools and pulleys of a belt conveyor are guarded to prevent workers from making contact with them.

### **8.3. Guarding of Screw-Type Conveyors**

ABC Company will ensure that:

- The moving parts of a screw-type conveyor are guarded to prevent workers from making contact with them;
- Each guard on a screw-type conveyor is secured by fasteners that can be removed only by using a tool; and
- The openings in mesh and grid guards meet the requirements of Appendix A of CSA Z432-94, *Safeguarding of Machinery*.

#### 8.4. Feed Points

ABC Company will ensure that if the feed point for a conveyor cannot be guarded because of the work process, any workers who are required to be in the area have and use suitable devices and tools that prevent them from making contact with the moving parts of the conveyor system. For the purposes of the above:

- Suitable devices include but are not limited to safety belts and lanyards rigged to prevent the worker from contacting moving parts;
- Suitable tools include but are not limited to materials-handling tools such as shovels or rakes—but **not** shovels or other tools that have “D” handles.

#### 8.5. Protections against Falling Materials

ABC Company will ensure that a conveyor has guards or sideboards to keep material from falling from the conveyor into areas occupied by workers if those falling materials pose the hazard of impact injury or burns.

#### 8.6. Guarding of Screw-Type Conveyors

ABC Company will ensure that:

- A conveyor has an emergency stopping system;
  - Exception: Such a system is not required if guards are used to prevent worker access to the conveyor;
- The emergency stopping system is designed and installed so that the system activates:
  - As a worker falls onto the conveyor; or
  - If a worker who falls on the conveyor moves an arm or leg off to one side of the conveyor;
- If the emergency stopping system uses a pull wire, the system activates by a pull of the wire in any direction, or by a slack cable condition;
- The conveyor emergency stopping system is designed and

installed so that it must be manually reset after an emergency stop before the conveyor can be restarted;

- A conveyor is not restarted after an emergency stop unless and until an inspection is performed and finds that the conveyor can be operated safely.

## **9. POWER PRESSES, BRAKE PRESSES & SHEARS**

### **9.1. General Safety Standards for Equipment**

ABC Company will ensure that point of operation safeguarding, and the design, construction, and reliability of operating controls of a power press, brake press, ironworker, or shear meets the requirements of whichever of the following standard that applies to the particular safeguard or operating controls:

- CSA Z142-M90, *Code for Punch Press and Brake Press Operations: Health, Safety, and Guarding Requirements*;
- ANSI B11.4-1993, *American National Standard for Machine Tools—Shears—Safety Requirements for Construction, Care, and Use*;
- ANSI B11.5-1988 (R1994), *American National Standard for Machine Tools—Ironworkers—Safety Requirements for Construction, Care, and Use*.

### **9.2. Point of Operation Safeguarding**

ABC Company will ensure that:

- The point of operation of a power press, brake press, or shear is safeguarded to prevent injury to the operator or any other worker;
- A hand feeding or extraction tool is not used as a substitute for point of operation safeguarding;
- A guillotine or alligator shear has a guard or other device that protects the operator from flying particles or material emanating from the shears;
- The point of operation of a manually powered press,

shear, or cutter is effectively guarded.

### **9.3. Removal of Point of Operation Safeguarding for Custom Work**

The safeguarding for the point of operation of a press brake may be removed if custom or different bends are being done with each cycle of the machine, but only if:

- Safe work procedures are in place and followed; and
- Safeguarding is replaced upon completion of the custom work.

### **9.4. Supervisor Control over Selector Switches**

ABC Company will ensure that a supervisor keeps control of the keys for all control selector switches when a power press or brake press is used in a production mode.

## **10. FEED-ROLLS & METAL-FORMING ROLLS**

ABC Company will ensure that:

- Feed-rolls have a guard or safety device that prevents the operator from making contact with any in-running nip points;
- A feed-roll guard is effective for the material thickness being processed;
- The clearance between a feed-roll guard and the material passing through the feed-rolls does not exceed 6 mm (1/4 inch);
- If the work process on metal-forming rolls prevents the use of guards, an emergency stopping system is installed across the machine, as well as across the rear (offside) of the machine if a worker is exposed to the hazard on that particular side; and
- The emergency stopping system referred to in the bullet immediately above activates automatically when it is contacted.

## 11. MACHINE TOOL WORK SAFETY MEASURES

ABC Company will ensure that:

- Cutting or cooling fluids, metal chips, swarf, or turnings from machine tool work are contained;
- Dogs that extend beyond the circumference of a lathe chuck are safeguarded from contact by the operator;
- Lathe stock is polished with tools designed for that purpose and **not** by hand via the use of hand held strips of abrasive cloth;
- Safeguards are provided to prevent a worker from contacting stock projecting from a machine tool;
- A shaper or planer bed opening is covered or safeguarded to eliminate shearing hazards;
- Safeguards are installed at the farthest points of travel of the carriage or table of a shaper, planer, surface grinder, or similar equipment to protect workers from contact with moving parts; and
- The rim of the revolving table of a vertical boring mill is safeguarded to prevent contact by workers.

## 12. ABRASIVE EQUIPMENT

### 12.1. General Safety Standards

ABC Company will ensure that abrasive wheels are guarded, used, and maintained to meet the requirements of ANSI B7.1-1988, *The Use, Care, and Protection of Abrasive Wheels*.

### 12.2. Protective Hoods on Abrasive Wheels

ABC Company will ensure that abrasive wheels have a protective hood to contain fragments of the wheel in case it breaks apart while it is turning. Exception: The previous item does **not** apply to:

- An abrasive wheel used for internal work;
- A mounted wheel of any shape or type that is 50 mm (2 inches) or less in diameter;

- A threaded hole, cone, or plug type of wheel if the nature of the work provides protection; or
- A portable grinder when it is used for grinding root passes in welded pipe, as long as:
  - The grinder has a protective hood covering at least 120° of the wheel periphery; and
  - The operator wears adequate eye and face protection.

### **12.3. Safety Restrictions on Speed of Abrasive Wheels**

ABC Company will ensure that:

- The allowable arbor or shaft speed of abrasive equipment is clearly marked on the equipment; and
- Pneumatic grinders have a governor which limits maximum shaft speed to the maximum speed specified by the tool manufacturer, and the maximum rate speed is marked on the equipment.

### **12.4. Ban on Dangerous Grinding Practices**

ABC Company will ensure that:

- The side of an abrasive wheel is not used for grinding; and
- Abrasive wheels are not used to grind non-ferrous materials unless the wheel is designed for such use.

### **12.5. Work Rests**

ABC Company will ensure that when work is hand-held, the grinding machine has an adjustable work rest with its upper edge:

- At or above the centreline of the abrasive wheel; and
- Within 3 mm (1/8 inch) of the cutting surface.

### **12.6. Control of Hazardous Dust**

ABC Company will ensure that dust from grinding or buffing

operations is controlled to prevent a hazard to workers.

### **13. WOODWORKING MACHINERY & EQUIPMENT**

#### **13.1. Safety Measures for Hand Feeding**

ABC Company will ensure that workers feeding woodworking machinery use a template, jig, or pushstick if there is a risk of injury to the worker's hands.

#### **13.2. Guarding of Woodworking Machines**

ABC Company will ensure that:

- Woodworking machines are properly guarded; and
- A guard on woodworking machinery is not removed unless:
  - The guard itself creates a hazard;
  - Removing the guard is necessary for maintenance; or
  - Use of the guard is clearly impracticable for a specific operation **and:**
    - An appropriate pushstick, jig, feather board, or similar device is used to keep the operator from encroaching into the cutting area; and
    - The guard is replaced upon completion of the operation.

#### **13.3. Safety Measures for Hand-Fed Circular Saws**

If a hand-fed circular saw is used for ripping wood or for any other purpose that creates the risk of kickback, ABC Company will ensure that the circular saw has:

- Anti-kickback fingers and a splitter designed to prevent kickback; or
- A riving knife designed to prevent kickback.

Exception: The above provision does not apply when the circular saw is used for grooving, dadoing, or rabbeting.

#### **13.4. Radial Arm Saw Travel Limits**

ABC Company will ensure that the cutting table and saw travel stop on a radial arm saw are designed and maintained so that no part of the saw blade can travel past the forward cutting edge of the cutting table.

#### **13.5. Guarding of Jointers**

ABC Company will ensure that hand-fed wood jointers have:

- A self-adjusting guard over the cutting head on the working side; and
- A guard over the portion of the cutting head behind the fence.

#### **13.6. Guarding of Sanding Machines**

ABC Company will ensure that:

- The revolving drums, pulleys, nip points, and unused runs of a sanding belt of a sanding machine is effectively guarded; and
- Guards are arranged so that only the portion of the belt necessary for the operation is exposed.

#### **13.7. Tenoning Machines**

ABC Company will ensure that hand-fed tenoning machines have a device that holds the material being cut.

#### **13.8. Cutting Heads**

ABC Company will ensure that:

- Cutting heads on a piece of woodworking equipment are properly adjusted and secured;
- If 2 or more knives are used in one head, they are balanced;
- A cutting head protective hood fitted on woodworking equipment is strong enough to contain fragments that

result from failure of cutting head components;

- Exception: The above cutting head protective hood requirement does not apply to a small hand-held router that uses a one piece cutting bit.

### **13.9. Guarding of Band Saws**

ABC Company will ensure that:

- The blade of a band saw is enclosed or guarded, except for the working side of the blade between the guide rolls and table; and
- A band saw wheel is fully encased.

### **14. TUMBLER DRUMS**

ABC Company will ensure that:

- Tumbler drums are guarded or enclosed;
- Any access door in a guard or enclosure has interlocks that prevent:
  - The access door from being opened while the drum is rotating; and
  - The drum from operating while the access door is open.

### **15. ROBOTS**

ABC Company will ensure that an industrial robot system is installed, safeguarded, maintained, tested and started, used, programmed, and that workers are trained to meet the requirements of either:

- CSA Z434-94, *Industrial Robots and Robot Systems—General Safety Requirements*; or
- ANSI/RIA R15.06-1992, American National Standard Industrial Robots and Robot Systems—Safety Requirements.

## **16. WORKERS' RESPONSIBILITIES**

To ensure their own safety and the effective implementation of this Policy, workers must:

- Wear clothing that does not expose them to hazards—including where workers are at risk of making contact with the moving parts of machinery or energized electrical equipment:
  - Wearing clothing that fits closely about the body;
  - Not wearing bracelets, rings, dangling neckwear, wristwatches, or similar articles (other than a medical alert bracelet with a transparent band that holds the bracelet snugly to the skin; and
  - Confining their head and facial hair or wearing it at a length that will prevent it from being snagged or caught in the work process;
- Comply with all applicable safe work procedures;
- Refrain from disabling, removing, tampering with, or manipulating machine guards or safeguards without their supervisor's authorization;
- Refrain from walking on or climbing over conveyors unless they are authorized and instructed to do so;
- Immediately report any defective or missing guards or safeguards to their supervisor.

## **17. TRAINING & INSTRUCTION**

ABC Company will ensure that all machine operators and workers who work with or near machinery or equipment that requires guarding or safeguarding in accordance with this Policy receive appropriate safety information, instruction, and training in:

- The hazards posed by each machine or piece of equipment that they work with or near;
- The guards and safeguards in place to protect them from those hazards;
- The limitations of those guards and safeguards;

- The proper use and handling, if any, of those guards and safeguards.

## **18. PRIME CONTRACTORS, CONTRACTORS & SUBCONTRACTORS**

ABC Company will ensure that all prime contractors, contractors, and subcontractors that are hired to perform work at its work sites operating or working with or near machinery or equipment that requires guarding, safeguarding, or any other safety measures under this Policy are:

- Notified of the machine hazards to which their workers are exposed;
- Notified of this Policy and the applicable guarding or safeguarding devices, methods, and systems in place at the work site to protect workers from those hazards.

ABC Company will ensure that workers of contractors and subcontractors involved in the contract work are protected from machine hazards in accordance with this Policy by requiring the contractor or subcontractor to directly follow this Policy and the ABC Company machine guarding or safeguarding devices, methods, and systems that are already in place with respect to the ABC Company -owned machinery or equipment located at the workplace involved in the contract work.

Ensuring that prime contractors, contractors, or subcontractors that bring in their own machinery or equipment and who cannot use the existing ABC Company machine guarding and safeguarding devices, methods, and systems are required to ensure that their own devices, methods, and systems:

- Comply with the Regulation;
- Are suitable for the workplace; and
- Compatible with the machine guarding or safeguarding devices, methods, and systems used by ABC Company for its own machinery or equipment.

## **19. EVALUATION**

This Policy will be reviewed, in consultation with the workplace Joint Health and Safety Committee, Health and Safety Representative, or, where no Committee or Representative exists, directly with workers at the site, at least once a year and more frequently in response to changes and developments affecting workers' health and safety.

### **Legislation/Regulations/Standards**

Workers Compensation Act, RSBC 1996, c 492

Occupational Health and Safety Regulation, BC Reg 296/97

CSA Z432-94, Safeguarding of Machinery

ANSI/ASME B20.1-1993, Safety Standards for Conveyors and Related Equipment

CSA Z142-M90, Code for Punch Press and Brake Press Operations: Health, Safety, and Guarding Requirements

ANSI B11.4-1993, American National Standard for Machine Tools—Shears—Safety Requirements for Construction, Care, and Use

ANSI B11.5-1988 (R1994), American National Standard for Machine Tools—Ironworkers—Safety Requirements for Construction, Care, and Use

ANSI B7.1-1988, Use, Care, and Protection of Abrasive Wheels

CSA Z434-94, Industrial Robots and Robot Systems—General Safety Requirements

ANSI/RIA R15.06-1992, American National Standard Industrial Robots and Robot Systems—Safety Requirements