

Workplace Health and Safety Queensland

# Sawmilling Industry

## Health and Safety Guide 2011

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**Workplace Health and Safety Queensland**, Department of Justice and Attorney-General

Sawmilling industry health and safety guide 2011  
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# 1. Introduction

This *Sawmilling Industry Health and Safety Guide* was produced by industry representatives and stakeholders specifically for small to medium sized sawmills dealing with native plantation and hardwood. This guide provides advice about ways to manage exposure to risks identified as typical in the sawmilling industry. The guide identifies hazards common to sawmilling operations, including machinery and equipment, substances and work practices. Possible controls are suggested to help ensure the health and safety of workers, the public and others.

Relevant persons who are an employer or self-employed person, persons in control and others with obligations under the *Workplace Health and Safety Act 1995* should ensure that the health and safety hazards in the industry are controlled using a risk management approach.

The purpose of this guide is to provide:

- information on some of these hazards and risks
- control options for dealing with these hazards
- information on managing the risks
- a list of reference materials.

This guide does not address all potential hazards and their risks, but does address the major or most common ones. The identified control measures outline a range of options that may be adopted for the risks identified. Where this guide does not address an identified risk, it should be managed using the Risk Management Process (see chapter 3).

## 1.1 Organisation of this guide

This guide is designed to provide small and medium sized sawmills with a range of advice and tools to improve workplace health and safety.

Chapter 2	Advice on legal obligations under workplace health and safety legislation
Chapter 3	Information on risk management requirements for workplace health and safety
Chapter 4	Information and advice regarding common sawmill specific hazards and requirements for controlling risks
Chapter 5	Information and advice regarding generic health and safety issues common to sawmills and advice for controlling risks
Appendix 1	List of audit checklists available for sawmill hazards
Appendix 2	Hazard identification register
Appendix 3	Risk management form
Appendix 4	Job Safety Analysis form
Appendix 5	Incident notification blank form (Form 3)
Appendix 6	Sources of further information

## 2. Legal obligations

The *Workplace Health and Safety Act 1995* (the Act) imposes obligations on certain people at workplaces to ensure workplace health and safety. Workplace health and safety is ensured when persons are free from death, injury or illness created by workplaces, relevant workplaces areas, work activities, or plant or substances for use at a workplace. Ensuring workplace health and safety involves identifying and managing exposure to the risks at your workplace.

### 2.1 Obligation holders

In the case of sawmills, the following persons may have obligations under the act:

- relevant persons who are an employer
- persons in control of: a workplace, relevant workplace area, fixtures and fittings or plant
- persons conducting a business or undertaking
- contractors, sub-contractors and principal contractors
- relevant persons who are a self employed person
- designers, manufacturers, installers, erectors and suppliers of plant
- suppliers and manufacturers of substances for use at workplaces
- owners of specified high-risk plant
- workers and other persons at a workplace.

Obligation holders may be subject to more than one workplace health and safety obligation.

### 2.2 Acts, regulations and codes of practice

Legislation that is relevant to the sawmilling industry includes:

- *Workplace Health and Safety Act 1995* (the Act)
- *Workplace Health and Safety Regulation 2008* (the Regulation)
- *Electrical Safety Act 2002*
- *Electrical Safety Regulation 2002*
- *Building Fire Safety Regulation 1991*
- *Dangerous Goods Safety Management Act 2001*
- *Dangerous Goods Safety Management Regulation 2001*.

Under the Act, there are three types of instruments to help you meet your workplace health and safety obligations – regulations, ministerial notices and codes of practice.

If there is a regulation or ministerial notice about a risk, you **MUST** do what the regulation or notice says.

If there is a code of practice about a risk, you **MUST** either:

- (a) do what the code says
- (b) do all of the following:
  - adopt and follow another way that gives the same level of protection against the risk
  - take reasonable precautions
  - exercise proper diligence.

If there is no regulation, ministerial notice or code of practice about a risk, you must choose an appropriate way to manage exposure to the risk, take reasonable precautions, and exercise proper diligence to ensure that your obligations are met.

NOTE: There may be additional risks at your workplace, which have not been specifically addressed in this Sawmilling Industry Code of Practice, including its supplementary documents. You are still required under the Act to identify and assess these risks and ensure that control measures are implemented and reviewed to eliminate or minimise exposure to these risks.

This guide should be read in conjunction with the *Workplace Health and Safety Act 1995*, *Workplace Health and Safety Regulation 2008* and other relevant codes of practice. Where applicable, these codes of practice are referred to in the text.

A list of Codes of Practice relevant to sawmilling is provided in chapter 3.1 - *Hazard identification*. These codes give detailed guidance on particular hazards encountered in a sawmill. You are strongly advised to obtain the documents that are available from the Workplace Health and Safety Queensland (WHSQ) website at [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au) or from your local WHSQ office.

## 2.3 Standards

If a standard (Australian Standards for instance) is called up under a regulation, the standard is legally binding.

If a standard is referred to in a code of practice, you must meet the standard or adopt and follow a better way.

Australian and International Standards are available for purchase online from [www.saiglobal.com](http://www.saiglobal.com) or they can be viewed in larger public libraries, or at WHSQ offices.

The legislation can be accessed from the WHSQ website which also has a wealth of useful information and links to other legislation such as the Electrical Safety Legislation and legislative bodies such as Chemical Services, Queensland Fire and Rescue, Electrical Safety Office and others. The website is a useful reference point for all information regarding workplace health and safety and can be accessed at [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au).

## 3. Risk management

Risk management refers to the identification and assessment of the risks of injury or disease present at work or at a workplace and the control of those risks of injury or disease.

Discharging your obligation to ensure health and safety in a workplace involves identifying and managing exposure to risk. *The Risk Management Code of Practice 2007* states ways in which to manage risk and is applicable to all workplaces, and uses a five step process:

- Step 1:       **Identify** the hazards.
- Step 2:       **Assess** the risk.
- Step 3:       **Decide** on what control measures to take.
- Step 4:       **Implement** control measures.
- Step 5:       **Monitor** and review the effectiveness of measures.

**Hazard**    - is something that has the ability to cause harm.

**Risk**       - is the likelihood that it will happen.

**Control**   - is what is put in place to eliminate or minimise the risk.

Risk management is a careful examination of what could cause harm to people in your workplace. The process weighs up whether enough precautions exist, determines if more are needed to prevent harm and helps control exposure to prevent harm. The aim is to make sure that no one gets hurt or becomes ill – that a person returns home safely after work.

When undertaking risk management:

- involve workers in the process
- don't use it to justify a decision that has already been made
- consider good practice in the sawmilling industry
- make records of any risk management activities undertaken.

### Preparing for the five steps

Before approaching the five steps it is important to consider the context in which the risk management process takes place:

- **Step 1 - Identify the hazards**  
Know how to look for hazards and what to look for.
- **Step 2 - Assess the risk**  
Decide who might be harmed and how. How might someone be harmed? What is the harm? How likely is this harm?
- **Step 3 - Decide on control measures**  
Is there a Regulation or Code of Practice about any hazards you have identified? What are the existing controls? Are controls as high as possible in the list of control priorities? Do controls protect everyone exposed to harm? What additional controls are required?
- **Step 4 – Implement control measures**  
Put controls in place, develop a plan for improving controls and implement the improvements.
- **Step 5 - Review the control measures**  
Are the controls working? Are there any new problems?

Before approaching the five steps it is important to consider the context in which the risk management process takes place. Defining the context involves identifying:

- work processes, practices, activities and tasks that will be analysed in the risk management process and the steps involved
- how risks may interact with one another - one activity may effect risks in another
- the people involved in carrying out those work processes and in what capacity
- whether the people involved are sufficiently competent/skilled/experienced
- what items of plant or materials are used.

Risk assessment requires extensive consultation, including all the people doing the task such as employers, safety officers and experts. It can also extend to suppliers or manufacturers of plant or materials used in the sawmill.

Risk management should be undertaken:

- immediately - if it has never been done and whenever there are changes (such as to methods, materials and/or equipment) that may affect health and safety at the workplace.
- after an incident, accident, or near miss.
- at regular intervals appropriate to the level of risk.

See Appendix 2 for a *Hazard identification and register*, and Appendix 3 for a *Risk management form*.

### 3.1 Step 1 - Hazard identification

There are a number of ways to identify hazards. In a sawmill, a combination of methods may give the most complete results. Hazard identification methods include:

- **Job safety analysis (JSA):** A detailed breakdown of a task into steps which identify hazards at each step (see Appendix 4).
- **Inspection reports:** These can be from various sources depending on the size of the organisation.

Workplace Health and Safety Officers (WHSO's) must do a workplace inspection at least once a year or as agreed with the safety committee.

Workplace Health and Safety Representatives (WHSR's) may do workplace inspections of the area they work in or the workplace in general.

Electricians must inspect electrical equipment as directed by current electrical legislation.

Fitters, managers, supervisors or anyone delegated to do so may inspect and report on any area within their own area of competence or expertise. General site area inspections and plant and equipment inspections generally fall into this category.

- Inspections may also be targeted at a particular hazard, such as identifying confined spaces, noise surveys, sign audits, lighting inspections, housekeeping inspections.
- Hazard identification should be an ongoing process. The methods above should be repeated at appropriate intervals and the methods below will ensure that new or previously overlooked hazards are identified and controlled.

- **Fault reports:** Workers should be encouraged to report faulty equipment as soon as it occurs.
- **Accident/incident data:** Accidents and incidents must be recorded and investigated. The results of investigations should uncover the root cause of the event and produce

recommendations for preventing a recurrence of the same event. Data from records of accidents and incidents should be used to identify possible areas of concern.

- **Hazard reporting:** Workforce must be encouraged to report all hazards that occur in the workplace, which ensures that any hazards that do not fall into the above categories are still identified. Near misses, where there was almost an accident, should also be included in hazard reports or on a separate report.
- **Manufacturer's instructions:** Manufacturer's instructions, operating and maintenance manuals can be an important source of information about the hazards associated with plant. Material Safety Data Sheets give statements about the safe use, handling and storage of substances and materials.
- **Consultation:** Consultation with workers is one of the easiest and most effective ways of identifying hazards at the workplace. Because of their experience with the job, workers are usually aware of what can go wrong and why.

Whichever methods of hazard identification are used, care must be taken to ensure that these are followed through to completion of the risk management process, involving assessment of the risk posed by the hazard, selection and implementation of appropriate controls, and periodic review.

Some hazards require specific risk management measures and these are stated in the associated codes of practice. The list below shows the codes of practice currently associated with these hazards. Where a code of practice exists, you **must** either follow the code of practice or adopt and follow a better way.

Noise	<a href="#">Noise code of practice 2004</a>
Hazardous substances	<a href="#">Hazardous Substances Code of Practice 2003</a>
Confined spaces	<a href="#">A guide to working safely in confined spaces</a>
Plant	<a href="#">Plant code of practice 2005</a> <a href="#">Guide to safeguarding common machinery and plant</a>
Manual tasks	<a href="#">Manual Tasks Code of Practice 2010</a> <a href="#">Manual Handling Solutions in the Sawmilling Industry</a> (Vic)
First aid	<a href="#">First aid code of practice 2004</a>

The following hazards exist in a typical sawmill:

Sawmilling plant	Saws, ejected timber, machine hazards, and proximity to other plant.
Dust	Hazardous to respiration and may cause explosive atmospheres.
Compressed air	May inflict harm to people, may be residual energy in plant.
Mobile plant	If segregation of vehicles/pedestrians is not possible. Exhaust fumes.
Hot work	Fire risk, fumes, ultraviolet light.
Housekeeping	Trip hazards, contamination from substances, bad storage, and hygiene.
Lighting	Lighting of control panels, suitability for tasks, adequate for walkways.
Ultraviolet exposure	Working outdoors.
Contractors	Induction and training, competence.
Amenities	Suitable to workforce and environment.
Emergencies	Dangerous goods, spills, fire, environmental, medical, bomb, terrorist.
Hazardous substances	Timber treatment chemicals, other chemicals, asbestos.
Dangerous goods	Fuel storage.
Electricity	Electrical plant, switchboards, overhead cables and lights, dust build up.

Look for those things or processes at your workplace that could cause harm, asking the question ‘does this task/activity/situation/event have the potential to harm a person?’

Be aware that sawmill hazards are not always obvious. Some are concealed or not readily visible, like electricity, gases or high frequency noise. Others may develop over time, like wear and tear on plant or equipment, and others may be intermittent or temporary.

For more information on identifying hazards refer to Supplement 1 of the *Risk Management Code of Practice 2007*.

Once hazards are identified it is good practice to record them in a hazard register (see Appendix 2).

### 3.2 Step 2 - Risk assessment

Look for the ways that people could be hurt or become ill and at the possible causes of injury or illness. For each hazard:

- estimate the **likelihood** of an incident occurring at your workplace, bearing in mind existing control measures
- estimate the **consequences** of an incident occurring at your workplace, bearing in mind existing control measures.

**Likelihood** ranges from:

- very likely - could happen frequently
- likely - could happen occasionally
- unlikely - could happen, but rarely
- very unlikely - could happen, but probably never will

For more information about the factors affecting likelihood refer to Appendix A of Supplement 2 of the *Risk Management Code of Practice 2007*.

**Consequences** range from:

- extreme - death or permanent disablement
- major - serious bodily injury or serious work caused illness
- moderate - injury or illness requiring casualty treatment
- mild - requiring first aid only with no lost work time.

For more information about factors affecting consequences refer to Appendix B of Supplement 2 of the *Risk Management Code of Practice 2007*.

By combining your likelihood and consequence estimates you can rate the risk (see Appendix 3). Using the ratings of each risk, develop a prioritised list of workplace risks requiring action.

Consider the following groups of persons who may be in the sawmill:

- Young workers, trainees, women who are pregnant or breastfeeding who may be at higher risk.
- Cleaners, visitors, contractors, maintenance workers who may not be familiar with sawmill risks.
- The public or others in the sawmill, who could be hurt by sawmilling and associated activities.

For more information on how to do a risk assessment refer to Supplement 2 of the *Risk Management Code of Practice 2007*.

### 3.3 Step 3 – Decide on control measures

Answer the following questions:

- Are there legislated things that I must do in relation to the specific hazard?
- Is there a Code of Practice relating to the specific hazard?
- What are the existing controls?
- Are controls as high as possible in the hierarchy of control?
- Do controls protect everyone exposed to harm?
- What additional controls are required?

If there is a provision within the *Workplace Health and Safety Regulation 2008* about any hazards you have identified then you must control the risks associated with those hazards in the way specified.

If there is a Code of Practice about any of the hazards you have identified then you must do what the code of practice says or adopt and follow another way that gives the same level of protection against the risks.

If there is no direction within the Regulation, or you choose to follow another way to protect against risks you must consider the hierarchy of control measures to decide on what are appropriate control measures.

#### Hierarchy of control measures

Control measures should be implemented in the following order:

1. Eliminate the hazard or prevent the risk
2. If this is not possible:
  - replace with something less harmful
  - separate people from the harm
  - change work processes or the physical work environment, for example by redesigning work, plant, equipment, components or premises
  - apply administrative arrangements, for example limit entry or time spent in a hazardous area
  - use personal protective equipment.

For more information on deciding on control measures refer to Section 1 of Supplement 3 of the *Risk Management Code of Practice 2007*.

### 3.4 Step 4 - Implement control measures

Implementing control measures involves:

- **Developing work procedures** in relation to the new control measures to make sure they are effective. Management, supervision and worker responsibilities may need to be clearly defined in the work procedures.
- **Communication** – inform workers and others about the control measures to be implemented. Clearly communicate the reasons for the change.
- **Providing training and instruction** for workers, supervisors and others in relation to the new control measures.

- **Supervision** – provide adequate supervision to verify that the new control measures are being used correctly.
- **Maintenance** – spell out maintenance requirements and maintain plant accordingly to ensure the ongoing effectiveness of the new control measures.

For more information on putting control measures in place refer to Section 5 of Supplement 3 of the *Risk Management Code of Practice 2007*.

### 3.5 Step 5 - Monitor and review

The final step in the risk management process is to monitor and review the effectiveness of measures. For this step, it can be useful to ask the following questions:

- **Have control measures been implemented as planned?**
  - Are the chosen control measures in place?
  - Are these measures being used?
  - Are these measures being used correctly?
- **Are control measures working?**
  - Have the changes made to control exposure to the assessed risks been effective?
  - Has exposure to the assessed risks been eliminated or adequately reduced?
- **Are there any new problems?**
  - Have implemented control measures resulted in the introduction of any new problems?
  - Have implemented control measures resulted in the worsening of any existing problems?

To answer these questions, you can:

- consult with workers, supervisors and health and safety representatives
- refer to manufacturer's instructions
- refer to specialist practitioners and representatives of industry associations, unions and government bodies.

Set a date to review the entire workplace health and safety risk management process.

For more information on monitoring and reviewing control measures refer to Section 7 of Supplement 3 of the *Risk Management Code of Practice 2007*.

## 4. Specific components

### 4.1 Log handling

#### Specific hazards associated with handling logs

Hazards are mostly related to the unexpected movement of logs during loading/unloading, stacking and moving, which may result in crushing.

#### Controls for log handling

1. Loading machines are to have ROPS and FOPS.
2. Log loading machines should be fitted with a top clamp.
3. The truck driver must inspect the load of logs for possible movement before securing chains are released.
4. During unloading, the loader operator must ensure that the area of unloading is clear of all persons except the loader operator and truck driver.
5. During unloading, the truck driver should leave the cabin of the truck, wearing safety helmet, footwear and high-visibility clothing and stand clear of the danger area and within the sight of the loader operator throughout the unloading operation.
6. The loader should not commence unloading or should cease operations if the truck driver is not in sight or the driver's location is unknown.
7. If no log-restraining cage is available and there is potential for a log to fall, load security chains are to be released only when the load is restrained by an unloading machine on the load binder side, or by another positive form of restraint.
8. Before load binders are released, the loader operator is to ensure that, so far as is reasonably practicable, the load is adequately restrained to prevent unexpected movement of the logs. Where a loader with a grab is available, no load bindings are to be removed until the load is restrained.
9. The load is to be restrained on the side of the load where the securing devices are located. No person should be on the opposite side to the restraint.
10. When removing the load bindings, the front binding should be the last one to be removed.
11. It is possible for a top log of a load to fall off when the freed securing chain is pulled from the truck. Top logs may shift during transit and as a result they can be unstable. The driver can lessen the risk of injury if this should happen by:
  - Walking away from the truck, pulling the freed chain over the load, onto the ground;
  - Pulling the chain from under the truck so that the chain travels away from the driver.Both methods will ensure that the driver is away from the danger areas (approximately two metres from both sides of the truck) should a log fall.
12. Unloading at night without yard lights is prohibited. There must be sufficient light to ensure ground crew and the full length of the logs being handled by machinery are clearly visible. Using only the driving lights of the unloading machines is not safe, as they do not provide adequate safe illumination for unloading operations.
13. Night unloading should not occur without at least two persons present. During night unloading operations, an outer high visibility reflective garment must be worn.
14. Logs should be docked in a designated area within a log yard, away from the log loader working area and located on even ground. Chainsaw operator used to dock logs should be competent in the use of a chainsaw at least at a cross-cut level.
15. Logs should be stacked to ensure the security of the stack. Measures include maintaining stack heights as low as possible, and minimising the degree of slope. Suitable stanchions and chokes can be used to secure the log stack.

## 4.2 Chainsaws

**Specific hazards associated with using chainsaws include:**

- cutting
- crushing
- entrapment
- kickback
- fumes
- fire
- noise and vibration
- burns.

### **Controls for chainsaws**

1. Only trained chainsaw operators or trainees under supervision of a trained operator should operate a chainsaw.
2. The following personal protective equipment should be worn: helmet, ear protection, eye/face protection, chaps, high visibility clothing and steel cap boots.
3. Ensure that the chainsaw is in good working order prior to use.
4. Care should be taken when sharpening or checking the chain to avoid cuts.
5. Ensure the work area is clear of obstacles.
6. The chain brake should be engaged and the chainsaw firmly controlled when starting, with the chainsaw either on the ground or handle held firmly between the legs. The chainsaw should NEVER be drop-started.
7. Always check that the cutter bar is not touching any obstacle before starting.
8. The chainsaw should be held firmly with both hands when being operated.
9. The chain brake should be engaged when the motor is running (e.g. moving from log to log).
10. Only one log should be cut at a time.
11. Be aware of the location of the cutter bar nose at all times.
12. Be alert for the forces causing KICK BACK, PUSH BACK and PULL IN.
13. Do not over reach or cut above shoulder height.
14. Care should be taken when using the nose of the chainsaw, to avoid kickback through contact with the upper quadrant of the cutter bar.
15. Do not twist the saw when withdrawing the bar from an under cut.
16. Use extreme caution when re-entering a previous cut.
17. Be alert for shifting of the log or other forces that may cause the cut to close and pinch the chain.

## 4.3 Log debarking

**Specific hazards associated with mechanical log debarking/merchandising systems include:**

- crushing
- entrapment
- projectiles
- noise and vibration
- stored energy (hydraulic and air systems).

### **Controls for mechanical log debarkers/mechandisers**

1. Clearly mark areas around the log deck and log bins to keep pedestrians away from log debarking area.

2. Loaders should have clear access to log deck from log dump/unloading area.
3. The operator should be protected from the risk of flying debris and other hazards such as noise and dust.
4. Control area should be designed to allow for good visibility and safe operation of the machinery.
5. Lockout/tag out systems to be used to control unauthorised or inadvertent machine operation.
6. Detailed safe working procedures for dealing with equipment jamming.
7. Loaders should be used to clear heavy logs in the event of jamming and tangles.
8. Emergency stop mechanisms fitted in strategic and accessible locations.
9. Only trained operators or trainees under supervision should use the equipment.
10. Communication systems should be established to ensure operator is in communication with the loader operator and sawmill at all times.
11. PPE appropriate to the working conditions, including maintenance.

#### 4.4 Log carriages and breakdown saws

**Mechanical hazards** associated with log carriages and breakdown saws, from moving parts, ejected material or slips, trips and falls, which may result in:

- cutting
- crushing
- shearing
- entanglement
- entrapment
- impact
- puncture.

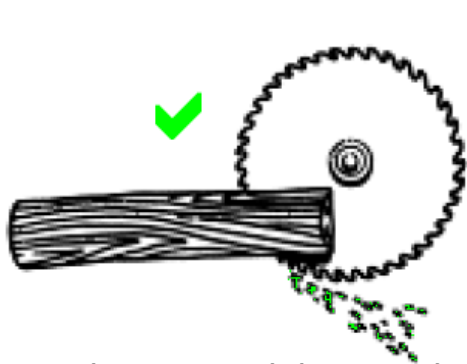
**Energy/electrical hazards** associated with log carriages and breakdown saws include:

- contact with live electrical or mechanical installation
- failure of energy supply resulting in loss of control systems
- stored energy (in hydraulic or air systems), kinetic energy, potential energy and radiation
- noise and vibration.

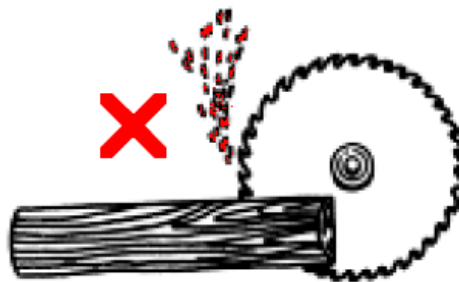
##### **Controls for log carriages and breakdown saws**

1. The area around the log carriage and break down saw should be fenced where practical and clearly signed to restrict access, particularly the off side of the carriage and where the full view of the area is restricted from the operating position. The restricted access area should be defined by risk assessment.
2. Fitches and pieces of timber (large and small) can be expelled from the saw. The zone where this occurs extends laterally from the centre of the saw at an angle of 7.5° on each side of the centreline the saw blade, in the direction of ejection from the blade(s). Projectile barriers and/or exclusion zones should be used to protect against this risk.
3. During operation of the log carriage no part of the track shall be used as a walkway.
4. Only a trained operator, or an operator in training, shall operate the log carriage.
5. Consider providing and using an enclosed operator's workstation clear of the breakdown saw and log carriage. An operator's enclosure must be designed and built to withstand the risks such as being hit by fitches.
6. Where an operator is located adjacent to the breakdown saw or log carriage, precautions should be taken to protect the operator from:
  - constant flying sawdust and water spray

- risk of being struck by flying slivers of timber
  - risk of being struck by heavy flitches
  - increased risk of manual task injury if needing to manually handle each flitch (such as pulling each flitch off the vertical).
7. During operation, only the operator(s) may be in the restricted area around the breakdown saw and log carriage.
  8. Operators shall have a safe unobstructed view of sawing operations and log carriage both on the “onside” and “offside”. Convex mirrors or cameras can be used.
  9. All logs must be secured (dogged) to the carriage before the log is passed through the saw.
  10. The carriage operator is responsible for physically checking that all persons are clear, prior to engaging the carriage and setting it in motion.
  11. The sawyers’ controls and other carriage controls shall be capable of being secured to prevent inadvertent operation.
  12. Emergency stop devices for the carriage and the saw must be placed within easy reach of the operator.
  13. Carriages that require the operator to ride on them shall be constructed to ensure that the operator cannot fall off during operation or come in contact with any structure (in all other cases a carriage shall not be ridden on). A person shall not get on or off a carriage while it is in motion.
  14. Wheels shall be guarded so as to prevent accidents and derailment, and be fitted with scrapers to keep the rails clear of debris.
  15. Buffers shall be fitted to each end of the travel rails to ensure that the carriage cannot be driven off either end of the rails.
  16. Rails shall be straight, level, equally spaced and securely anchored.
  17. Wire ropes, anchorage points and tensioning systems on carriages shall be inspected regularly for wear, breakage or defects.
  18. All winch drums shall be adequately guarded.
  19. Log securing devices shall be robust and have adequate holding and locking systems.
  20. All plant and equipment shall be supplied, installed and maintained in accordance with requirement of the Plant Code of Practice.
  21. Lasers used to assist in aligning logs on log carriages present particular risks. See chapter 5.17 *Lasers* for more information.



A downward cutting action helps secure the log on the cradle



An upward cutting action can cause instability and puts the operator at greater risk from flying debris. Avoid if possible.

## 4.5 Saw benches

**Mechanical hazards** associated with saw benches, from moving parts or ejected material, which may result in:

- cutting
- crushing
- shearing
- entanglement
- entrapment
- impact
- puncture.

**Energy/electrical hazards** associated with saw benches including:

- contact with live electrical or mechanical installation
- failure of energy supply resulting in loss of control systems
- stored energy (in hydraulic or air systems), kinetic energy and potential energy
- noise and vibration.

### Controls for saw benches

Saw blades are the obvious hazard on a saw bench but there is also a risk of injury from all moving parts such as pulleys, drives, chains, and hobs. Guarding of the saw blade and other mechanical parts must be done to prevent inadvertent contact. This guarding must include the risks above and below the bench for not only the operator but for maintenance and cleaning personnel and others in the area.

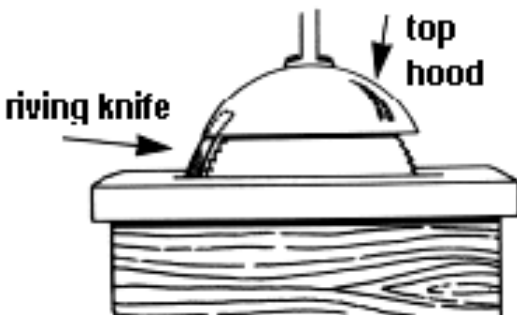
Specific areas requiring guarding:

1. The saw blade must be guarded above the bench by using an easily adjustable hood (top guard) and a correctly adjusted riving knife (back guard).
2. The lower half of the saw blade must be guarded with a fixed guard to prevent inadvertent contact.
3. The hood must be designed to cover the saw blade and riving knife down to the bench top and be used as low as practical while allowing timber and flitches to pass unobstructed.
4. The hood must be securely mounted and be independent of the riving knife and be no more than 100mm wide.
5. No saw should be left unattended while rotating, either powered or running down, unless the saw is completely enclosed.
6. Where a saw brake is not fitted, and the saw is accessible, the saw must have a hood guard that is lowered to the bench height immediately the saw is shut down.
7. A riving knife must be manufactured from high grade steel and have a smooth finish.
8. The riving knife should be approximately 10 per cent thicker than the body plate of the saw and be thinner than the saw kerf.
9. The inner edge of the riving knife should have a curved shape to suit the largest saw used in the bench and be adjustable in both the vertical and horizontal directions.

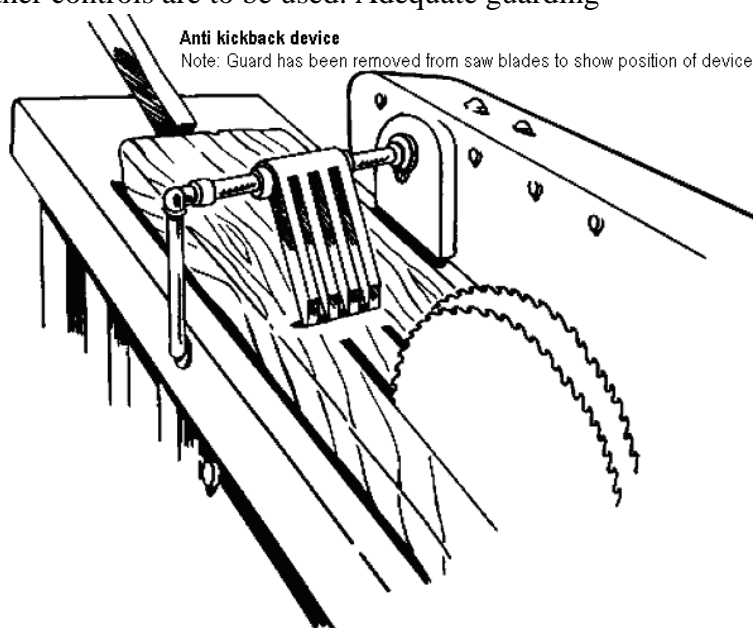
10. Correct riving knife adjustments are as follows:

- Height – not more than 13mm below the top of the saw teeth.
- Recommended gap between the inner knife edge and the saw teeth:

Saw diameter	Recommended gap
900 mm to 1050 mm	13 mm
1051 mm to 1200 mm	15 mm
1201 mm to 1500 mm	19 mm
1501 mm to 1950 mm	25 mm



11. Saw blade drives, pulleys and other nip points must be guarded with a fixed guard.
12. Power feed benches should be guarded, or an emergency stop bar fitted, to prevent the operator from being dragged into the saw.
13. The in-feed drive hob should be guarded to protect worker's fingers from being crushed and pulled into the feed. Where possible consideration should be given to installing an emergency hob release mechanism.
14. Emergency stop devices must be placed within easy reach of the operator/benchman and the tail-out.
15. Materials may be thrown from the saw - this can occur as a result of kickback or as part of the normal milling processes. The risk of "kickback" can be controlled through the combination of guarding the operator and the use of correctly adjusted riving knives/back guards and hoods/top guards. Anti-kickback devices can also be fitted.
16. Current standards define a hazard zone around all circular saws as the area where flitches and pieces of timber (large and small) can be expelled from the saw. The zone where kickback occurs extends laterally from the centre of the saw at an angle of  $7.5^\circ$  on both sides of the saw blade. Operator controls must be located outside the hazard zone and protected from materials thrown from the saw. Entry to the hazard zone should be prohibited during sawing operations and the area guarded by use of projectile barriers.
17. For breast bench saws where all of the above protection measures are not available, correct adjustment of the hood guard and riving knife is critical and adequate personal protective equipment, training and other controls are to be used. Adequate guarding must be provided on any manual gauge to prevent hands from contacting the saw blade.
18. Access for maintenance, cleaning or removing blockages etc. must not be permitted unless the equipment is isolated from all sources of energy and tagged/locked out.
19. Australian Standard 1473.1-2000 provides further information on the design, manufacture, guarding and use of milling equipment used for the primary milling of saw logs into green sawn timber products.



## Standing a saw and packing adjustment

1. One of the most dangerous operations within the sawmilling industry is adjusting the packing of circular saws while the blade is running. There have been many incidents where fingers have been severed during the adjustment of the packing of a running saw. This is due mainly to the packing adjustment being located in close proximity of the saw blade. The situation is exacerbated when adjustment nuts become worn, increasing the likelihood of the spanner slipping.

Note the close proximity of packing adjustment nuts to the saw blade.

Consider relocating the packing adjustment by retrofitting a hydraulic adjustment to the front, or screw adjustment to the left and right edges of the bench.



2. The manual adjustment-packing nut of the packing adjustment mechanism should be relocated away from the top surface of the bench. This can be achieved by:
  - Screw adjustment - increase the length of the adjusting screws (both sides) so that they extend past the sides of the bench. Alternatively, hand adjustments can be relocated to the front of the bench by the use of steel rods and swivel joints. Minor re-design of the bench may be necessary.
  - Hydraulic adjustment - existing screw adjustment mechanisms may be removed and replaced by a hydraulic (grease gun) system. Adjustment controls can be located on the front skirt of the bench.

Using remote packing adjustment keeps the operator well away from the saw blade.



### **Packing procedures**

Note: There is a reduced risk of serious injury if the saw blade is stopped during packing adjustment, particularly if the location of the adjusting nuts is close to the saw blade. This can be achieved by either of the two following methods.

#### ***Straight edge***

1. Remove saw blade, with the saw out of bench, align inside saw collar with the inside packing block using a straight edge. When aligned, lock position of inside packing block with lock nut positioned on packing adjuster.
2. Replace saw blade, put outside collar onto saw shaft and tighten saw collar nut. Do not over-tighten.
3. Loosen or unlock outside packing nut
4. Wind outside packing block up to saw blade.
5. Turn saw by hand (take care) to ensure the packing is firm but not tight. The saw should move freely.
6. Lock outside packing into position.
7. Start saw. It should run true and not get hot.

#### ***Using a guard***

1. A guard must be used to prevent access to the saw teeth during the packing procedure if this is undertaken while the saw is running.
2. The guard must be of robust construction and designed to prevent access to the front of the saw teeth from any direction during the packing process. Mesh is recommended so that the saw blade can be seen. The guard should flip down from a permanent attachment to the hood guard.
3. The following packing procedure should be followed:
  - Loosen or unlock the outside packing nut.
  - Wind outside packing block up to saw blade, ensuring the packing is firm but not tight (saw should move freely).
  - Lock outside packing into position.

## **4.6 Docking saws**

**Mechanical hazards** associated with a docking saw, from moving parts or ejected material, may result in:

- cutting
- crushing
- shearing
- entanglement
- entrapment
- impact
- puncture.

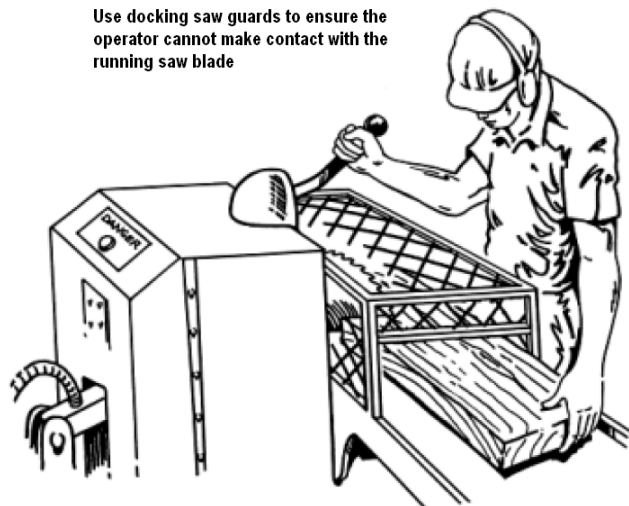
**Energy/electrical hazards** associated with a docking saw:

- Contact with live electrical or mechanical installation.
- Failure of energy supply resulting in loss of control systems.
- Stored energy (in hydraulic or air systems), kinetic energy and potential energy.
- Noise and vibration.

### Controls for docking saws

1. The docking saw shall be operated and maintained under conditions to ensure that the health and safety of persons is not put at risk.
2. Only operators who are trained or are under supervised training shall operate docking saws.
3. Only trained operators and authorised personnel shall be permitted in the hazard zone of the docking saw, which is the area within reach of moving parts.
4. The docking saw shall be fitted with a top guard that provides maximum protection in both the cutting and non-cutting position. The guard shall cover at least the top half of the saw blade and extend over the arbor ends and be hinged on the side for access to remove the saw blade.
5. When a docking saw is at its rest position, the saw blade should be fully enclosed and returned to a position behind the docking fence.
6. All docking saws should be operated by the activation of two buttons spaced apart to prevent operation by one hand unless compliant guarding is in place.
7. The saw should be guarded to prevent human contact with the blade drives from any direction. For instance, side guards at least 300 mm from blade for two-handed operation and at least 600mm from blade for one handed or foot operation.
8. The counter weight, spring, air ram or hydraulic ram shall be securely mounted to the saw frame and shall return the saw to a position of rest without rebound at least 30 mm behind the docking fence.
9. The gap between the guide fences shall be kept to a minimum (3 mm to 4 mm wider than the kerf of the saw blade).
10. The correct diameter docking saw blade must be used and the saw tooth pattern must be suitable for the application at all times.
11. The saw must be at a standstill before cleaning or adjustments are made. If time does not allow for this, then electrical or mechanical means should be used to stop the saw and lock the saw out.
12. When operating a docking saw with a two-button hand control system, both buttons should be pressed simultaneously, using both hands, before the saw will come forward to cut the timber. Control buttons should be spaced apart to prevent a one-handed operation.
13. Operating buttons should be shrouded to ensure that they are not accidentally engaged.
14. Controls must have keyed control lock-down to ensure the saw is not inadvertently operated when the machine is not in use.  
The saw must be fitted with a whole/main current isolation, which isolates all sources of energy (e.g. electrical, pneumatic, and hydraulic).  
Emergency stop switches should be fitted in a prominent position, readily accessible by the operator, and be activated by hand, knee or foot.
15. A docking saw should be located so that the operator is not at risk from being struck or having a finger or hand jammed by the in-feeding timber.
16. Timber on the in-feed roll-case/transfer deck/conveyor should come to rest before the docking saw operator handles it.
17. Timber to be docked must be placed firmly onto the docking bed and against the docking fence. In the event that this method is not adopted the saw will grab the timber and drag the timber against the fence and could result in crushed fingers.

Use docking saw guards to ensure the operator cannot make contact with the running saw blade



## **Manual docking saws**

- Pull saws
- Pendulum saws
- 1. These saws should be set up so they automatically return to the rest position on release of the handle, and they do not “bounce” back into the work area. This can be achieved by either spring return or counter-balanced return.
- 2. Pendulum and pull docking saws shall be provided with a device to limit the travel of the blade so that no part of the saw blade will be closer than 100mm to the front of the workbench when fully extended.
- 3. Pendulum and pull docking saws shall be fitted with handles firmly fixed and well clear of the saw blade teeth.
- 4. It is recommended that on pendulum docking saws a metal guard/belly plate be placed at the front edge of the workbench between the saw and the operator.

## **Power operated docking saws**

This saw is powered through the timber and should be set to automatically return to its rest position without further completing its cycle when either/or:

- the hand control is released
- the hand control is returned to the neutral position
- air/hydraulic pressures are lost.

## **Automatic docking saws**

An automatic docking saw is designed to operate on a continuous basis, without the need of an operator. They should be fully enclosed, guarded, or protected by a perimeter fence incorporating an access gate fitted with a fail-safe interlock switch. When activated the interlock switch should prevent the saw from moving to cut timber and the reset control should be located outside the perimeter fence.

## **Drop saws**

Drop saws with a portable configuration must be fitted with peripheral guards that prevent contact from any direction, compliant with Australian Standards. All guards must be in place during the cutting operation, including any adjustable backing plate. The docking and holding of short pieces of timber less than 300mm in total length should be avoided as the saw can bite into the timber and drag the operators hand into the path of the rotating saw blade.

## **4.7 Round table/green chain**

### **Hazards associated with round table or green chain**

- Slips, trips and falls
- Body stresses
- Ultraviolet exposure
- Crushing injuries
- Noise (proximity to other equipment)
- Hazardous substances
- Cuts, abrasions, splinters
- Sprains, strains and back injuries.

### **Control measures for round table/green chains**

- Ensure the work area is kept clear of all obstructions.
- Ensure good workplace layout. consider an ergonomic assessment of the work area.
- Ensure personnel are trained in manual handling techniques.
- Job rotation should be considered to help minimise repetitive injuries and ultraviolet exposure.
- Ensure personnel have appropriate personal protection equipment, including: gloves, hats, sun screen, hearing protection and so on.
- Care should be taken when handling marking ink - material safety data sheet should be consulted.
- Controls of nip points and other on green chains should be as for conveyers.

## **4.8 Planing and sizing machines**

**Mechanical hazards** associated with planing and sizing machines, from moving parts or ejected material, which may result in:

- cutting
- crushing
- entanglement
- entrapment
- impact
- puncture.

**Energy/electrical hazards** associated with planing and sizing machines:

- Contact with live electrical conductors.
- Contact with exposed nip points.
- Failure of energy supply resulting in loss of control systems.
- Stored energy (mechanical, hydraulic or pneumatic), kinetic and potential energy.
- Noise and vibration.

### **Controls for planing and sizing machines**

1. Planing and sizing machines shall be operated and maintained under conditions to ensure that the health and safety of persons is not affected.
2. Only trained operators shall operate the sizing machine.
3. Only trained operators and authorised personnel shall be permitted in the danger area surrounding the planing and sizing machine.
4. Operators shall have safe unobstructed view of the planing and sizing operations.
5. Do not simultaneously feed material of varying thickness through a machine fitted with a solid in-feed roller.
6. Never look through the machine feed opening when the cutter block is revolving.
7. Stand to one side of the material being fed through the machine in case of kickback.
8. Do not attempt to make a cut exceeding manufacturer's recommendations.
9. Do not feed material with too great a variation in thickness through a machine as kickback may occur.
10. Do not remove broken pieces, knots or chips from the table while the cutter block is revolving.
11. Never put your entire weight onto a jammed work piece, particularly if it is thin.
12. When planing thin timber, support it by feeding it onto a jig (false table) placed into the machine.

13. Never lower the table when a piece of timber will not feed through as kickback may occur. Isolate the machine, wait for the cutter block to stop revolving, and then make any necessary adjustments.
14. Allow the cutter block to reach maximum revolutions before feeding material through or joining.
15. Keep hands clear of the cutter block when jointing.
16. Safety glasses and hearing protection must be worn at all times in the immediate vicinity when planing and sizing machines are operating.
17. Ensure all guards are in place before operating.
18. Never use undue force to put material through the planer/sizer.

## **4.9 Treatment plant**

### **Specific hazards associated with treatment plants**

- Moving mechanical parts
- Entrapment
- Impact
- Confined space
- Chemical exposure
- Vacuum
- Contact with live electrical installation
- Failure of energy supply resulting in loss of control systems
- Stored energy (in hydraulic or air systems), kinetic energy and potential energy
- Noise and vibration
- Poor lighting

### **Controls for treatment plants**

- Only operators who are trained or are under supervised training shall operate treatment plants.
- The material safety data sheet (MSDS) contains critical information about the appropriate use of chemicals. The advice contained on the MSDS must be followed.
- Operators should be familiar with the MSDS for the chemical in use. The MSDS should be readily available at the treatment plant.
- Where substances are designated as being hazardous on the MSDS, operators must be trained in storage and use of hazardous substances.
- Emergency procedures for the substances being used should be displayed.
- Where required by the MSDS for the chemical in use, emergency eyewash and emergency shower facilities should be located at the treatment plant.
- Food and drink should not be stored or consumed in the treatment plant.
- Only trained operators and authorised personnel shall be permitted in the treatment plant work area.
- Appropriate personal protective equipment must be worn when handling timber preservative, treated product or waste material.
  - Eye protection
  - Gloves/gauntlets
  - Gum boots/impervious footwear
  - Protective clothing/coveralls
  - Respirator/dust mask

- Hearing protection where noise levels exceed 85 dB(A).
- Work area and drip pads must be kept in a tidy condition (e.g. dunnage picked up and drip pads hosed down).
- All run-off from drip pads must be contained in sumps to be recycled.
- The treatment area plus treatment and storage tanks must be contained in a bunded area.
- Where the operator is not in continuous attendance, a safety shut-down system should be provided in case of system failure.
- All safety devices, pressure valves, pumps and trolleys should be serviced and maintained at regular intervals.
- See section on pressure vessels for details of specific maintenance requirements for pressure vessels, valves and so on.
- Some treatment chemicals (e.g. CCA) may require that plant operators have regular health surveillance. The list of substances that require health surveillance can be found in the *Workplace Health and Safety Regulation 2008*.
- Emergency response procedures in the event of a chemical spill should be developed.

## **4.10 Kilns (low temperature hardwood)**

### **Specific hazards associated with gas/electric kilns**

- Steam
- Gas
- Heat
- Electrocution
- Humidity
- Entrapment
- Confined space

### **Control measures for low temperature kilns**

- All kilns must be fitted with a means of escape for any person inadvertently trapped inside.
- When entering a kiln for maintenance or repair, appropriate isolation procedures must be adhered to.
- A charged kiln with main doors closed would be considered a 'confined space' and require appropriate control measures.
- Steam poses a risk of injury when in contact with skin.
- Steamers can rapidly generate heated water and steam and must not be left unattended during testing.
- Steamers must be covered to prevent inadvertent access.
- Inspection doors should be positioned away from steamers.
- Care must be taken when opening inspection doors during operation to avoid contact with hot air or steam escaping the kiln.
- Long leather gloves should be used to protect hands and arms from exposure and safety glasses to protect the eyes.
- Steam lines, heat transfer lines and associated equipment (e.g. valves) should be protected to avoid inadvertent contact with hot parts.
- When performing maintenance, care should be taken to ensure heated parts have cooled sufficiently to eliminate the risk of burns.

- Heat generated during the drying process must be exhausted before any maintenance or repair work can be commence inside the kiln.

#### **Gas**

- All gas cylinders and fittings must comply with Australian Standards and dangerous goods regulations.
- All gas fitting must be installed and maintained by a trade qualified gas fitter.
- While any gas work is being performed, all gas lines and valves must be isolated using a lockout/tagout system.
- Regular visual checks of gas tanks, cylinders, lines and fittings should be carried out to ensure no damage or leaks. If any leaks are detected the gas supply must be isolated immediately until a qualified gas fitter can repair the fault. Faulty cylinders and bulk storage tanks must be reported to the supplier immediately.
- Out of date cylinders or bulk storage tanks must not be filled. The supplier must be notified to replace them.

### **4.11 Other fixed plant**

Refer to the *Plant Code of Practice* for particular ways to manage the risks associated with plant and for further references on guarding.

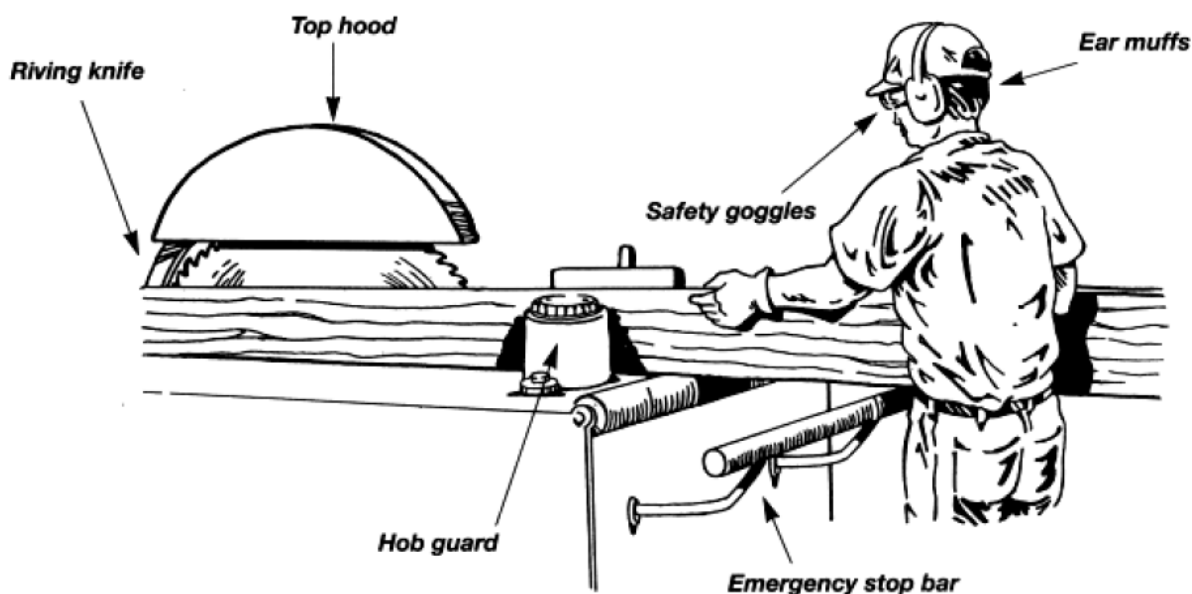
#### **Plant and equipment hazards**

- Nip Points - where fingers may get caught between belt and pulley or chain and sprocket.
- Crushing hazards - where hands or fingers may be crushed between parts of a machine (moving or stationary) or between parts of the machine and timber being processed.
- Shearing hazards - where saw blades or other sharp edges may sever fingers or hands.
- Entanglement hazards - where clothing or body parts may become caught up in moving parts of a machine.
- Entrapment hazards - where clothing or body parts may become trapped between parts of a machine or materials and machine.
- Drawing in hazards - where body parts or clothing may be dragged into dangerous parts of equipment (such as conveyor belts).
- Ejected material - flitches, timber and so forth that is thrown from saws, conveyors, decks and other plant/equipment. Swarf from grinding and cutting processes.
- Proximity.
- Noise.
- Sources of energy - including stored energy - electrical, compressed air, hydraulic.
- Dust - generated by the sawing or planing process.
- Hazardous substances - when planing or sawing treated timber that may produce contaminated dust.
- Manual handling - of timber or parts of equipment.
- Ergonomics - design of workstation and posture.
- Lighting - at operator stations and worker positions.

#### **Controls for plant safety**

Plant should be serviced, maintained and cleaned in accordance with manufacturer instructions or if these are not available, with other proven criteria. Records should be kept of inspection, maintenance and repair of plant and also of instruction and training for employees who operate plant.

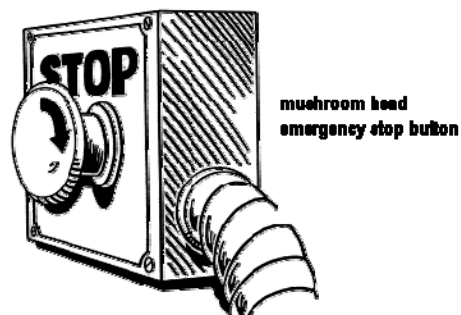
Plant must be isolated from all sources of energy for maintenance and cleaning purposes.



Typical safe guards for a rip saw

### Guarding for machine hazards

- Fixed guards - mesh or other appropriate material to prevent access by body parts to moving parts of equipment, shafts, drums and so on. Mesh size should be determined from proximity to hazard and size of body part to be excluded.
- Adjustable guards – top hood guards, or moving guard on drop saw blade.
- Barriers - to prevent access to hazardous areas around equipment, and to protect people outside the hazardous area from ejected material.
- Interlocked guards - guards which, when a particular undesired action is made, will automatically stop the associated machine. Interlocked gates through conveyors, interlocked doors on equipment enclosure for example.
- Emergency stops- should be red mushroom type or lock in push button, manual reset type and must be located within easy reach of the operator. Resetting the emergency stop must not start the machine- this must only be possible by manually restarting.
- Before any work involving removal or repair of plant, breaking into lines and systems or any other task that may involve exposure of workers to hazards, an assessment of the risks should be conducted.
- Where significant risks have been identified, safe work procedures should be prepared with specific details for identified hazards such as energy sources, movement by other forces such as gravity, moving loads and/or energy.
- Before commencing work on plant, all sources of energy must be isolated. This includes stored energy in electrical, compressed air and hydraulic systems.



Where isolation procedures are implemented often, such as for particular plant routine replacement or maintenance, standard work procedures could be developed and used as required.

Training in relation to isolation procedures should be conducted, as required, to ensure competency. Isolation procedures should be periodically reviewed or when plant is modified or replaced, or new plant is introduced.

## 4.12 Chippers

**Mechanical hazards** associated with chippers, from moving parts or ejected material, which may result in:

- cutting
- entanglement
- entrapment
- impact
- puncture.

**Energy/electrical hazards** associated with chippers include:

- contact with live electrical or mechanical installation
- stored energy (in hydraulic or air systems), kinetic energy and potential energy
- noise and vibration.

### Controls for chippers

- Ideally chippers should be located remote from the mill due to their generation of noise and vibration.
- No worker shall be allowed to operate a chipper installation unless they have been trained in its operations, isolation procedures, and use of personal protective equipment.
- High noise levels can be experienced in and around the chipper. Noise level monitoring should be carried out to ensure workers are not subjected to more than 85 dB(A) per eight-hour day.
- Properly constructed acoustic enclosures with extended apertures and baffles on the in-feed and out-feed conveyors can reduce externally transmitted noise.
- All equipment must be isolated and tagged and the knife ring stationary before performing any work such as clearing jam-ups, changing chipper knives, maintenance. This is particularly important when the machinery can be reactivated from a point out of view.
- When handling chipper knives, it is necessary to ensure that the worker is protected from the cutting edge by gloves, aprons or other means.
- A vibrating in-feed conveyor can be used to remove sawdust and settle timber.
- Magnets or metal detectors should be considered as a means of preventing metallic objects entering the chipper.

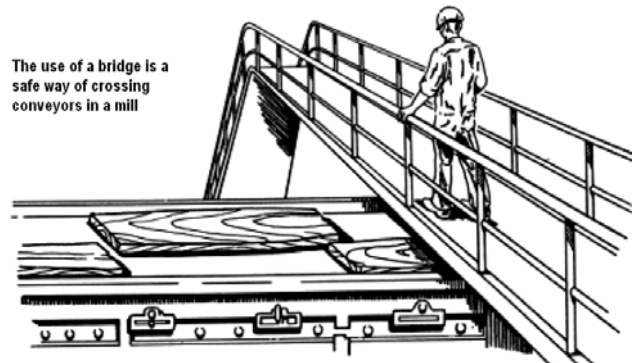
## 4.13 Conveyors (including chain and belt conveyors, rollers and transfer decks)

Conveyors, roller decks and chain decks are designed to move heavy loads and have powerful motors that are capable of inflicting serious injury to any part of a person's body that gets caught up in the moving parts driven by them.

**Hazards associated with conveyors include:**

**Mechanical hazards**

- In-running nip points – such as where belts or chains run onto pulleys, gears or drive wheels and hands, fingers or clothing can get drawn in.
- Abrasion areas - such as moving shafts and spindles where contact may result in skin abrasion or burns.
- Crushing hazards - where hands or fingers may be crushed by moving material.



The use of a bridge is a safe way of crossing conveyors in a mill

**Energy**

- Release of stored energy in hydraulic and compressed air systems.
- Electricity.
- Failure of energy resulting in loss of control systems.

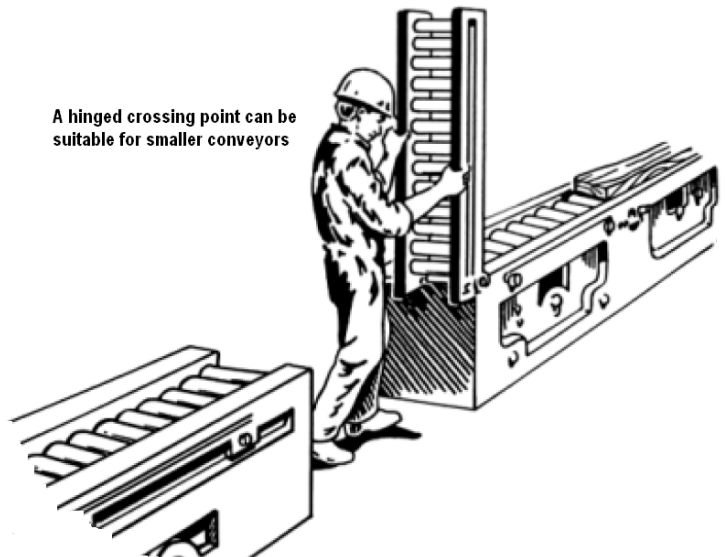
**Contact with moving parts**

- Belts, chains, rollers.

**Impact with moving material**

- Being struck by moving timber that overhangs the edges.
- Being struck by ejected timber from jam ups.
- Entanglement with moving timber.

A hinged crossing point can be suitable for smaller conveyors



**Control measures for conveyors**

1. All accessible nip points, including drive system of all conveyors shall be guarded.
2. Guarding shall be installed on all conveyors to prevent unplanned access into the conveyor. This shall include areas of potential blockage into which persons may have to climb to free such blockage.
3. Crossovers or underpasses must be provided where access to either side of the conveyor is required. All crossovers should be designed and constructed to provide safe access and be of solid construction, including steps and guardrails on both sides and a non-slip walkway surface.
4. Hinged sections, which act as barriers, should be provided at both sides of walk-through openings in a roller-case conveyor. All hinged sections should be designed to automatically stop the conveyor and its load when opened. Such hinged sections should also be so designed that they do not in themselves create a hazard by falling on or striking any person.
5. The frame and decks around conveyors shall be of adequate strength to support the work being performed.
6. Emergency stops must be located:
  - at each end of the conveyor
  - at each transfer point (loading/unloading)
  - every 30 metres

- at all work stations.
- 7. A lanyard switch/pull wire (emergency stop) may be located at any point along the conveyor.
- 8. Operation and maintenance procedures shall be in accordance with the requirements for the positive isolation of each conveyor drive whether electrical, hydraulic, pneumatic or mechanical.
- 9. Walkways in and around conveyors must comply with Australian Standard 1755 or Australian Standard 1657.

#### **4.14 Powered mobile plant (including loaders and cranes)**

Reference should be made to the *Plant Code of Practice* which contains information and guidance in the section on Powered Mobile Plant.

Powered mobile plant is defined as plant that has some form of self propulsion and is controlled by an operator. Examples of powered mobile plant that may be found in a sawmill include but are not limited to:

- forklifts (driven and pedestrian operated)
- loaders
- bobcats
- cranes
- tip trucks
- cherry pickers
- tractors.

##### **Hazards associated with powered mobile plant**

- Operator competency
- Speed
- Pedestrians
- Uneven surface (overturning)
- Collision
- Overhead cables
- Restricted vision
- Flammable substance
- Exhaust fumes
- Maintenance
- Noise and vibration

##### **Control measures for powered mobile plant**

- Most powered mobile plant used in a sawmill will be subject to the risk of rollover and dislodged loads and therefore require protective structures (ROPS and/or FOPS) to be fitted.
- All powered mobile plant with ROPS or FOPS should be fitted with seat belts which are worn by operators.
- Speed restrictions must be in place on all worksites where vehicles are present, to protect vehicles and pedestrians and minimise the dust raised by them.
- Where there are pedestrians and mobile plant at the same workplace, consider the following hierarchy of controls:

- Exclude pedestrians from plant operating areas.
- Segregate plant and pedestrians by marking a plant operating zone
- If neither of the above is possible, provide high visibility clothing such as shirts or vests, and warning signs to make pedestrians more visible to operators.
- Ensure mobile plant is fitted with a visual beacon and with audible reversing alarms.
- Ensure training and induction material includes the need to be aware of the risks associated with powered mobile plant.
- Load lifting using powered mobile plant should always be within the limitations of the approved load for the plant.
- Loads must never be lifted over the heads of persons or buildings.
- Mobile powered plant may produce toxic exhaust fumes which can collect in low lying areas such as pits, tunnels, and drains, such plant must not operate in the vicinity of these areas if there are persons working in them.
- Mobile plant should not be allowed to operate where there is a danger of overturning from hazards such as steep slopes, edges and very uneven surfaces.
- All mobile plant must be maintained in a safe condition and records should be kept.

### **Operator licensing**

Operators of certain load shifting equipment, forklifts, cranes or hoists, as well as doggers, require a license.

Most log loaders used in the industry are classified as either a front end loader or a forklift truck and this will determine the license required.

A person slinging and directing the load may require a dogging license.

Licenses required in a sawmill may include:

#### **Earthmoving equipment operation licences**

LZ	Dozer (wheeled and tracked)
LE	Excavator (engine capacity of more than 2 litres)
LL	Front end loader (having an engine capacity of more than 2 litres)
LB	Front end loader/backhoe (having an engine capacity of more than 2 litres)
LS	Skid steer loader (having an engine capacity of more than 2 litres)

#### **Forklift operation licences**

LF	Forklift truck (other than a pedestrian operated forklift truck)
LO	Order picking forklift truck

#### **Crane and hoist operation licences**

CB	Bridge or gantry crane (non-remote operation) (Other than operation by a remote control having not more than three powered operations)
CP	Portal boom crane
CV	Vehicle loading crane
CN	Non slewing mobile crane (greater than three tonnes capacity)
C2	Slewing mobile crane (with a capacity of 20 tonnes or less)
C6	Slewing mobile crane (with a capacity of 60 tonnes or less)
C1	Slewing mobile crane (with a capacity of 100 tonnes or less)
C0	Slewing mobile crane (with a capacity of more than 100 tonnes)

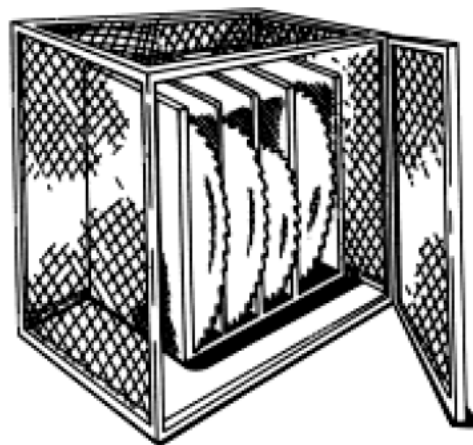
#### **Dogging license**

DG	Dogging ( includes selection and inspection of lifting gear including slinging and movement of loads handled by a crane)
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## 4.15 Blade handling

### Hazards associated with blade handling:

- Transportation route - steps, walkways, proximity to other workers and equipment, possible trip hazards, visibility, length of route.
- Transportation methods - manual carrying should be avoided if possible.
- Size and weight - large diameter saw blades and bandsaws pose particular handling hazards to legs and arms when carried or lifted manually.
- Storage - proximity to walkways and people.
- Carrying - methods of actually holding onto the blade.
- Sharpening - use of abrasive wheels/grinders.

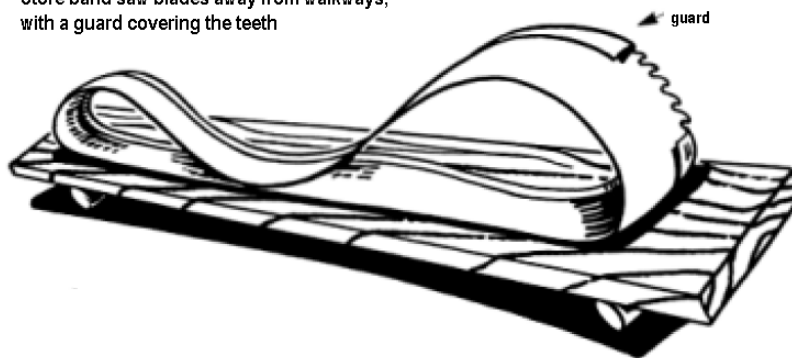


Safe storage for saw blades

### Control measures for handling blades

- Circular saw blades should be stored in purpose built racks whenever they are not in use. These should be guarded and if possible located away from walkways and access routes.
- Restrict access to areas where large blades are stored.
- Old saw blades should not be left unprotected in the work area.
- Bandsaw teeth must be covered during transportation and storage.
- Use a container to transport smaller blades.
- Circular saw blades should be covered at all times during transportation and storage. Consider the use of Kevlar or leather covers.
- Consider the use of trolleys and mechanical lifting aids for transporting large diameter saw blades and bandsaws. Where mechanical lifting aides are not available, seek the assistance of others when undertaking a heavy or awkward lift.
- A simple carrying tool can be made to ensure the edges of circular blades are angled away from legs during carrying (illustration below).
- Use the safest route when transporting large blades - avoid steps, stairs and rough floor surfaces.
- Saw sharpening and maintenance should only be undertaken by trained persons.
- Sharpening and grinding equipment must be properly guarded.
- Dust removal unit should be fitted to grinding machines.
- Ensure grinding wheels are the correct type for the task.
- Automatic sharpening equipment must be located away from walkways and access routes, with appropriate

Store band saw blades away from walkways, with a guard covering the teeth



warning signs and barriers to prevent accidental contact. Consider restricting access to the sharpening area.

- Eye protection must be worn when in the vicinity of operating grinders/saw sharpeners.
- Cut resistant gloves (made from materials such as Kevlar or ballistic nylon) should be used when handling saw blades.

## **4.16 Portable power tools**

A relevant person who is an employer is responsible for the safe condition of tools and equipment used by employees. Portable power tools present a range of hazards, including:

- electrocution
- moving parts
- flying objects being ejected
- trip hazards
- heat
- ignition source
- vibration
- dust and fumes
- noise.

### **Control measures for portable power tools**

- Equipment must have a current test tag.
- Power tools must be used in accordance with manufacturer instructions.
- Training and instruction must be given for safe operation.
- Visually inspect the tool for damage before use.
- Defective tools should be removed from service and tagged as unsafe.
- Any required items of personal protective equipment must be worn (e.g. eye protection, hearing protection).
- Persons not having to perform work in the area where the power tool is being operated should remain at a safe distance.
- Power tools not in use should be stored safely.
- Exercise caution when using electrical power tools near flammable materials.

## **4.17 Timber yard layout**

A timber yard layout can pose the following hazards:

- vehicles and mobile plant
- uneven surface
- unstable stacks
- overhead cables
- restricted vision
- fire
- dust.

### **Control measures for timber yard layout**

- Outdoor working surfaces should be constructed to provide a relatively flat and safe working surface.

- Ensure the workplace is maintained to avoid obstructions.
- Yard layout should aim to segregate pedestrian routes from vehicle operating areas. These areas should be clearly marked or physically separated where possible.
- Access to the timber yard should be restricted to authorised vehicles only.
- Timber stacks should have packs stacked evenly, rows to be vertical, alleys to enable easy access at lowest operating height.
- The height of timber stacks should be limited to ensure the stack remains stable. Factors impacting on safe stacking height include:
  - stability of ground surface
  - slope of ground and pack orientation
  - pack composition and use of dunnage
  - use of intermediate bearers
  - terracing of outside packs.
- In general, single outdoor stacks should not be higher than 3 metres.
- Entry to timber stacks should be restricted, particularly where stacks are nearing height limits.

#### **4.18 Platforms, walkways, stairways and ladders**

Platforms, walkways, stairways and ladders can pose the following hazards:

- Uneven surface
- Slippery surface
- Lighting
- Slips, trips and falls.

##### **Control measures for platforms, walkways, stairways and ladders**

- Ensure they are constructed in compliance to Australian Standard 1657.
- Provide a good working surface.
- Provide non slip surfaces.
- Ensure areas are clear of all obstructions.
- Ensure adequate lighting provided.

#### **4.19 Strapping and stacking timber**

Strapping and stacking timber can pose the following hazards:

- Cuts
- Eye injury
- Crush injuries

##### **Control measures for strapping timber**

- Strapping can be of various qualities. The supplier should be consulted to determine the specifications of appropriate strapping. Strapping of unknown properties should be avoided.
- Straps can include steel strapping, polyester strapping, polypropylene strapping and wire. Strapping of appropriate properties must be chosen for the application.

##### **When applying strapping to a pack:**

- Determine the weight of the pack

- Determine the breaking strain of a number of sections of strap to achieve a 2:1 ratio.  
*For example: Pack weighs 1 tonne. The breaking strain of the selected strapping is 800Kg's. Three (3) straps would be needed to achieve a 2:1 ratio.*
- Before using strapping consideration must be given to the following:
  - The weight of the pack
  - How much compression is needed
  - Length of the pack (to determine flexing)
  - Rough sawn or dressed
  - Shape of the pack (flat or round)
  - How it is handled (forklift and transport)
- Wear all appropriate personal protective equipment as determined by a risk assessment and/or suppliers/manufactures instructions. Special attention shall be given to eye and hand protection.
- Avoid excessive tensioning that may cause the wire or strapping to fail.
- Always position yourself to one side of the strap or wire being tensioned or cut. Never stand directly over or in front of the strap or wire being tensioned or cut.
- When cutting strap or wire from packs start with the middle strap and move towards the end of the packs and cut those straps last.
- Use the correct cutting tool for cutting strap or wire. Under no circumstances should you improvise.
- Workers should be trained in the safe procedures for strapping of product for dispatch/delivery and removal of strapping.
- Adequate provision for the safe disposal of strapping should be provided.
- Ensure that the assembly and strapping system used, tightly packs the bottom layers. (Pack strapping is tensioned from the top, so the base of the pack may not be tight.)
- Ensure that the size of the packs and their strapping system is appropriate to restrain all individual pieces of timber.

#### **Control measures for stacking timber**

- The storage area should be as flat as possible.
- Dunnage used is of a sufficient size and standard to support the weight of the stack.
- Allow sufficient space between stacks to allow safe movement and operation of forklifts.
- Generally single stacks should not exceed the height by more than 4 times the base width. Note that a 1 metre wide pack should not be more than 4 metres high - less if not square or stable.
- Stack the packs squarely on top of each other.
- Ensure no person is unnecessarily in the vicinity of a forklift during stacking. In particular, ensure no persons are on the back edge of a stack during stacking or unstacking operations.

## **4.20 Fire pits and other waste disposal systems**

### **Hazards associated with fire pits and waste disposal systems**

- Heat and burns
- Fire
- Explosion
- Smoke
- Unauthorised access.

### **Control measures for fire pits and waste disposal systems**

1. Waste disposal fires can be open, pit or enclosed in a purpose built structure that is usually fed by a conveyor and must be constructed and maintained in a condition that is without risk to the health and safety of workers and members of the public.
2. Location of a waste fire should consider:
  - proximity to buildings, log and timber stacks, sawdust heaps, overhead services and other assets or flammable materials
  - distance from neighbouring properties
  - prevailing winds that may cause smoke and ash to be blown towards neighbours
  - lay of the land to prevent material run-off during wet weather.
3. A safety fence should enclose the waste burning area to prevent unauthorised entry.
4. Warning signs should be erected to warn unsuspecting persons of the danger of being injured by fire, hot ash or ground collapse close to the fire edge.
5. Areas surrounding the fire should be kept clear of flammable/combustible material at all times.
6. Approval should be gained from the Queensland Fire Service and other relevant authorities (including the local council and the Department of Environment and Natural Resources) before operating waste disposal fires.
7. Treated timber waste should not be disposed of by this method. This material may be disposed of by using licensed disposal contractors.
8. Waste burners:
  - Must be fitted with spark arresters and external sprinkling systems.
  - Enclosed feed systems should be used to transport sawdust to the burner.
  - During cleaning and maintenance, confined space procedures should be implemented.
9. All fire ash should be extinguished and cold before being removed from the fire area so that another fire is not started.

## **4.21 Sawdust and chip storage**

### **Hazards associated with sawdust and woodchip storage**

- Pollution
- Spontaneous combustion
- Collapse
- Engulfment
- Entrapment.

### **Control measures**

- Public access must be restricted to stockpiles of sawdust and woodchips.

### **Storage bins**

- Procedures should be established for the safe unloading of bins, in particular for unblocking the discharge chute and filter maintenance.
- Entry into storage containers is subject to confined space regulations.
- Dust generation should be minimised when unloading storage bins. Personal protective equipment (e.g. P1 respirator and eye protection) should be used when dust cannot be controlled in other ways.
- Naked flames and other sources of ignition should be controlled to reduce the risk of wood dust explosion.

### **Stockpiles of sawdust and woodchips**

- Stockpiles of sawdust and woodchip should be located away from overhead powerlines or sources of combustion and clear of waterways.
- Precautions should be made to ensure that dust from stockpiles does not impose on workers or neighbouring properties.
- Woodchip and sawdust stockpiles must be maintained in a manner to eliminate the threat of collapse.
- When constructing a free standing stockpile, the base should be as wide as practical to avoid slippage.
- When working on a stockpile, care must be taken not to drive vehicles over unstable material, particularly near the edge of the main access path.
- When excavating a stockpile, care must be taken not to leave shear faces exposed. The face must be left at a safe angle to prevent collapse.
- Sawdust and woodchip stockpiles generate heat that can lead to spontaneous combustion.
- Stockpiles should be monitored for temperature build up and signs of combustion.
- Stockpiles can be turned over to prevent temperature build up. Where possible, stockpiles should be completely removed and a new stockpile made at regular intervals.
- Adequate fire fighting equipment should be on hand to defend against fire.

## 5. General health and safety issues

### 5.1 Manual tasks

#### What are manual tasks?

Manual tasks are involved in nearly all work undertaken by workers in a sawmill. These tasks include activities that require sawmill workers to grasp, manipulate, strike, throw, carry, move (lift, lower, push, pull), hold or restrain an object or load (e.g. sorting and stacking timber, packing and loading finished product, and cleaning work areas, tools and equipment).

#### How to prevent injury from manual tasks

1. Identify problem tasks that need investigating – not all manual tasks are hazardous.
2. Assess the risks by analysing the problem tasks to find out which risk factors are causing problems. Risk factors include:
  - **direct** risk factors that stress the body including:
    - forceful muscle exertions (e.g. when lifting heavy timber unassisted)
    - working postures (e.g. working while bending over because a bench is too low)
    - repetitive muscle actions (e.g. whilst sorting and grading timber)
    - duration (e.g. working for long periods of time without a break)
    - vibration (e.g. working on a saw bench that vibrates excessively).
  - **contributing and modifying** risk factors cause the above direct risk factors and include things like the design of the work area, types of tools used, the types of timber handled, how it is handled and how the work is done. The contributing and modifying risk factors are changed or modified in order to eliminate or minimise the direct risk factors, for instance raising the height of a workbench will eliminate the need to work in a bent posture.
3. Identify the risk factors requiring control.
4. Select and implement suitable solutions or controls to prevent or minimise the risks. Design controls are the most effective, for instance automation using an ‘auto stacker’ and board turning equipment or ‘flippers’, improving work area design to eliminate double handling, using automatic sharpening equipment.
5. Monitor and review the effectiveness of the solutions or controls.

#### Manual Tasks Code of Practice 2010

Obligation holders must either follow the guidance in the [Manual Tasks Code of Practice 2010](#) or adopt and follow another way that gives equal or better protection.

#### Further information on manual tasks risks

- [An Employers Guide to the Manual Tasks Code of Practice](#) - Workplace health and Safety Queensland (2009)
- [Participative Ergonomics for Manual Tasks \(PERforM\) Handbook](#) - Workplace Health and Safety Queensland (2009)
- [Strains and Sprains Prevention Handbook](#) - Workplace Health and Safety Queensland (2005)
- [Manual Handling Solutions in the Sawmilling Industry](#) - Worksafe Victoria (2005).

### 5.2

## Housekeeping, buildings and grounds

### Hazards associated with ground surface condition

Ground surfaces that are uneven or where there is a presence of pot holes, drains washouts or soft spots are hazards that can create a risk to a person's health and safety. These are particularly hazardous with regard to slips trips and falls and destabilising loads being carried on vehicles including mobile plant such as forklifts, end-loaders and mobile cranes.

### Control measures for ground surface condition

1. Every effort should be made to ensure access ways are stabilised if required by the use of compacted road base material, drained to prevent pooling of water and embankments or wash-out signposted or barricaded to prevent access.
2. The ground surface should be kept free of sharp objects that have the potential to penetrate pneumatic tyres causing blow outs effecting stability.
3. Nuisance dust should be controlled by frequently wetting dusty surfaces or more permanently by applying a sealer on the ground surfaces.

### Hazards associated with the condition of buildings (visual aspect)

Building should be of safe and sound construction. The construction condition and stability should comply with the *Building Code of Australia* and Local Government by-laws.

### Control measures for the condition of buildings (visual aspect)

1. Annual inspections - should be performed by a person who has a good understanding of safe building requirements and the standards that must be met.
2. Repairs and maintenance kept up to date.

## 5.3 Noise

Excessive noise is a level of noise above 85 dB(A) over an eight hour day or a peak of 140 dB(Lin). The level of noise in most sawmills will almost certainly exceed this threshold.

A good indicator of a possible noise problem is if you have to raise your voice to be heard when you are talking to someone about one metre away.

Exposure to excessive noise can lead to headache, fatigue, tinnitus, hearing impairment or total hearing loss. These effects may often not become apparent until the person's later years and the damage cannot be reversed.

### Hazards associated with noise

Sources of excessive noise include:

- saws and planners
- debarkers and chippers
- mobile plant
- other items of plant, including pneumatic equipment
- miscellaneous items (conveyors, dust extraction equipment, motors and gearboxes, truck movements).

### Control measures for noise

Obligation holders should refer to the *Code of Practice for Noise Management at Work*, which states ways to manage the risks from excessive noise including assessing the risks and

implementing noise control measures in consultation with the workers concerned, and in accordance with the hierarchy of controls:

- **Substitution:** Replace noisy machinery with equipment designed for operation at lower noise levels.
- **Redesign:** Use sound dampening devices to minimise noise from equipment (e.g. mufflers, mats under motors, silencers on air exhaust valves).
- **Isolation:** Isolate noisy equipment and activities by moving away from other people or by using sound absorbing barriers. Noisy elements that are not an integral part of the basic machine may be suitable for separation. For example, wood dust blowers and air compressors could be moved from the processing area.
- **Administration:** Conduct noise exposure surveys, developing a noise policy and noise management program. Provide education, training and information on noise. Provide regular audiometric testing for exposed workers. Compare the latest test with previous results as part of a hearing conservation program.
- **Personal protective equipment:** Use hearing protection to minimise residual noise where other methods of control do not sufficiently reduce noise levels.

Obligation holders must either do what this standard says or adopt and follow a way that gives equal or better protection.

## 5.4 Vibration

### Hazards associated with vibration

*Whole-body vibration* occurs when a worker is in contact with a vibrating surface such as a seat or floor in heavy vehicles or machinery. Prolonged exposure increases the risk of low back pain, degeneration of the lumbar vertebrae, disc-herniation and other health effects.

*Hand/arm vibration* occurs from vibrations transferred to the hands and up the arms disrupting the blood and oxygen circulation in the affected areas and damages nerves and tendons. Hand/arm vibration contributes to ‘vibration-induced white finger’ and ‘carpal tunnel syndrome’ through the gripping force needed to hold vibrating tools (the tighter the grip, the more vibration is absorbed); and the repetitive shock loads of some tools.

Hand/arm vibration occurs when a worker holds, for example:

- vibrating hand tools such as sanders, grinders, polishers, drills, circular saws, needle scalers, chain saws, lawn mowers, whipper snippers, hedge clippers
- percussive tools (chippers and riveters) and petrol-powered tools (chain saws, leaf blowers).
- air operated tools (chipping hammers, routers and torque wrenches)
- vibrating steering wheels on vehicles and vessels or vibrating handles and controls.

Factors that influence the effect of vibration on the hand and wrist include:

- vibration frequency, duration of exposure and grip force applied
- hardness of the material being worked on and type of handle bar insulation
- cold conditions and whether the worker smokes (smoking affects blood circulation)
- state of cutting edges and tool maintenance
- training and experience of the worker.

### **Control measures for vibration**

In the event workers are exposed to whole body vibration for significant portions of the work shift, consideration should be given to the following control options:

1. Isolate or dampen vibrating work areas and platforms.
2. Operate equipment at suggested speed.
3. Limit exposure to whole body vibration.
4. Provide breaks away from vibrating sources.
5. Vary the pattern of work to break up periods of continuous driving.
6. Improve vehicle suspension and install suspension dampened operator seats.
7. Provide training on seat adjustment for individual drivers.
8. Drive the vehicle to reduce vibration levels by:
  - driving at the manufacturer's suggested speed or introducing speed limits
  - plan and maintain work site routes with the smoothest terrain and keep speed low when crossing uneven terrain
  - steer the vehicle to avoid hitting objects and pot holes.

When vibration from tools/equipment is transmitted to the operators hand, the following controls should be considered:

1. Workers who naturally get white fingers during cold weather conditions should not be working with vibrating hand held power tools until given clearance by a doctor.
2. Avoid tools with vibration in the range of 4-300 Hz for tasks performed repeatedly.
3. Choose tools that have speed adjustment, internal damping, vibration-isolated handles, or automatic shut off.
4. Use air-cushioned cylinders, air shut off clutches, or properly selected isolation mounts.
5. Cover handles with vibration-insulation rubber after purchase.
6. Maintain cutting edges and equipment on a regular basis.
7. Provide training in:
  - good working practices to reduce vibration directed into the hands (e.g. resting the tool on a support or on the work piece as much as possible)
  - how to use minimum grip for proper safe tool operation
  - the problems with smoking, with regard to its link to vibration white finger
  - recognising symptoms (finger tingling or whitening) which may indicate potential health problems
  - the need to report early symptoms of vibration disease to a supervisor.

## **5.5 Confined spaces**

A confined space means a space that is large enough and so configured that an employee can enter and perform assigned work, has limited or restricted means for entry or exit and is not designed for continuous employee occupancy. Most sawmills will have confined spaces.

These can include:

- kilns
- sawdust pits
- treatment vessels
- sawdust bins (on extraction systems)
- tanks
- sewers and pipes.

### **Confined space hazards**

Confined spaces in sawmills present the following hazards:

- Hazardous atmosphere - treatment chemicals, exhaust fumes, welding fumes.
- Hazardous substances - treatment chemicals.

- Explosive atmosphere - high concentrations of sawdust in atmosphere.
- Artificial extreme temperature - kilns.
- Extreme humidity - kilns.
- Risk of engulfment - sawdust bins.
- Risk of entrapment - kilns and treatment vessels.

### **Controls for confined spaces**

Part 18 of the *Workplace Health and Safety Regulation 2008* sets out requirements that **must** be followed. These include:

- identification of confined spaces
- confined space entry permits
- confined space entry training
- trained standby person
- rescue equipment
- communication
- hazardous atmospheres
- respiratory and ventilation equipment.

Further information can be obtained from [A guide to working safely in confined spaces](#).

## **5.6 Dust**

### **Dust hazards**

Wood dust can irritate the eyes, respiratory system and skin. Particular care should be taken when machining preservative-treated wood because of possible health effects from the added chemicals. Refer to the Material Safety Data Sheet for that product.

Hardwood, such as beech, oak, ash and mahogany, or native hardwoods such as eucalyptus are generally more of a problem irritant. The dust generated is associated with nasal cancers. Softwood timber from coniferous trees, such as pine is less of a risk.

Some woods and wood dusts can contain naturally occurring chemicals, which may cause sensitisation in some people, such as dermatitis and asthma. (*Sensitisation* means that repeated exposure to a particular substance may result in an increased allergic response to that substance.) Persons who may be affected should wear protective clothing, such as long shirtsleeves to avoid skin contact. Wash soiled clothing, and do not shake off the dust.

### **Control measures for dust**

The best way to control dust inhalation is by the using properly designed and maintained dust extraction systems. In addition to dust extraction equipment, work areas should be well ventilated. In the absence of dust extraction, an approved dust mask should be used.

The average airborne concentration of wood dust (over a normal eight-hour working day, for a five day working week) should not exceed 1 mg per cubic metre (hardwood) and 5 mg per cubic metre (softwood).

The higher capture velocity required for finer wood dusts can often be met by simple modifications to existing equipment. For example:

- Reducing the size of the collector hood openings and placing them as close as practicable to the point of dust collection will assist in raising capture velocities.
- Collection efficiency will also be improved by closing ducts connected to machines that are not in use (subject to maintaining the recommended minimum air velocity in the

remaining ducting). For fine wood dusts, the air velocity in the ducting needs to be 15 to 20 m/sec to prevent an accumulation of dust (plugging), which could cause a fire risk.

High concentrations of wood dust, particularly from sanding, can form explosive mixtures with air. It is recommended that ducting should be fitted with explosion vents. For large extraction systems, the fitting of spark detectors and automatic extinguishing equipment is advisable. Electric motors should be spark proof.

Wood dust that gathers in places such as on the floor, on ledges or in machinery pits, should be removed by suction devices or wet sweeping. Use of compressed air should be avoided.

Speed restrictions should be imposed to avoid dust caused by mobile plant such as loaders and forklifts, and consider water sprinkling in very dry conditions.

## 5.7 Hot work and fire precautions

Hot work includes work that produces heat and/or sparks or molten metal, such as welding, grinding, gouging, flame or abrasive cutting, and has the potential to cause a fire hazard.

### **Hazards associated with hot work:**

- Burns
- Ignition of combustible materials and flammable liquids
- Smoke and fumes.

### **Control measures for hot work include:**

1. Hot Work Permit detailing risks and controls.
2. Fire fighting equipment located in close proximity and tested to ensure positive operation and sufficient supply.
3. Appropriate ventilation and personal protective equipment.
4. Clean area of sawdust and flammable material.
5. Dampen area in which hot work is to be undertaken.
6. Check area once hot work is complete for smoke or smoldering materials and dampen any hot spots.
7. Arrange for the hot work area to be monitored for at least 30 minutes after the work has been performed.

Note: No "hot work" is to be carried out within one hour of close of business, to prevent any smoldering particles igniting sawdust or other materials once the area is unattended..

## 5.8 Working at height

Risks must be managed if a person could fall from **any** height.

### **Examples of hazards associated with working at height:**

- Falls onto hard surfaces and objects.
- Falls through surfaces (such as roofs and floors).
- Falling from surfaces (such as roofs, plant or equipment).
- Falling objects.

### **Control measures for falls:**

1. Edge protection
2. Fall protection covers
3. Travel restraint systems

4. Fall arrest platforms
5. Fall arrest harness systems

**Control measure for falling objects:**

1. Barriers and barricades
2. Toe/kick boards
3. Catch nets
4. Tool restraints/lanyards

**USE OF LADDERS**

An employer or self-employed person must prevent or minimise the risk of injury from using a ladder.

**Single or extension ladders may only be used to:**

- gain access
- carry out permitted work – where the material or equipment being carried does not restrict movement or cause loss of balance, the trunk of the body remains centred on the ladder and equipment can be used with one hand (unless a control to prevent a fall is used).

**The ladder** should have a load rating of not less than 120 kg and be:

1. manufactured for industrial use
2. used only for the designed purpose
3. inspected annually
4. not more than 6.1 m for a single ladder
5. not more than 9.2 m for an extension ladder used for electrical work or 7.5 m for other work
6. erected at an angle between 70° and 80°.

**When erecting ladders**, the following precautions should be considered:

1. Inspect the ladder before use.
2. Place ladder feet on a substantial base on a firm and stable surface and keep the area around the top and bottom of the ladder clear.
3. Position the ladder at such a pitch that the horizontal distance from the top support to the foot of the ladder is about one-quarter of the working length of the ladder (30 cm out for every 1.2 m).
4. Do not place ladders in passageways, doorways, driveways, or any location where they may be displaced by activities being conducted in any other work, unless protected by barricades or guards.
5. Tie, block, or otherwise secure ladders while in use to prevent their being displaced.
6. Do not use ladders in a horizontal position as platforms, runways, or scaffolds.
7. Extend the side rails at least 1 m above the surface being accessed.
8. Secure at top and bottom.

**When using ladders** the following precautions should be adopted:

1. Visually inspect the ladder before climbing.
2. Have three points of substantial contact with the ladder or a stable object, for instance standing on the ladder with two feet while holding a fascia board or timber stud.
3. Both hands are used for climbing up and down.
4. Face the ladder when ascending or descending.
5. Use a fall-arrest harness system (not attached to the ladder).
6. Allow only one person on a ladder at a time.
7. Never use metal ladders for electrical work or where they or the user may contact electrical conductors.
8. Never use ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective construction.

## 5.9 Hazardous substances and dangerous goods

Hazardous substances and dangerous goods have specific regulatory requirements under Queensland legislation. Part 16 (Hazardous substances) of the *Workplace Health and Safety Regulation 2008*, the *Hazardous substances code of practice*, the *Dangerous Goods Safety Management Act* and *Dangerous Goods Safety Management Regulation* may all apply.

### Hazardous substances in sawmills

Hazardous substances have the potential to cause ill effects to persons and the environment. They are classified as:

- toxic
- harmful
- corrosive
- irritant
- sensitising
- carcinogenic (causing cancer)
- mutagenic (causing genetic damage)
- teratogenic (causing abnormalities of the foetus).

All sawmills will have some hazardous substances on site, and may include:

- timber preservatives used in treatment plants
- fuels and oils in oil stores, tanks and workshops
- gas for kilns or welding
- marking inks and spray paints in log yards, storerooms and offices
- herbicides and pesticides for use in yards
- cleaning materials in stores and offices
- sundry materials in workshops such as paints, adhesives, solvents.

### Control measures for hazardous substances

Reference should be made to the [Hazardous Substances Code of Practice 2003](#) and Part 16 Hazardous substances of the *Workplace Health and Safety Regulation 2008*. The code states specific requirements such as:

- risk assessments for hazardous substances
- a register of all hazardous substances on site
- copies of material safety data sheets (MSDS) for all hazardous substances on site
- storage requirements
- information and training
- first aid
- personal protective equipment for hazardous substances
- health monitoring where required (e.g. for treatment chemicals).

The primary source of information available is the MSDS. These will help a workplace to gather the necessary information to safely manage the hazardous substance. The relevant person who is an employer must obtain a copy of the MSDS before the substance is brought into the workplace.

A relevant person who is an employer should ensure that persons in the workplace have ready access to MSDSs and that they understand the content of the MSDS, in particular the sections on chemical and physical properties, health hazards and precautions for safe use of the hazardous substance in question.

MSDSs should be reviewed regularly to ensure they are current.

Clear labelling of hazardous substance containers must be maintained, including decanted substances.

If the substance in a container cannot be identified, the container should be marked “**Caution Do Not Use - Unknown Substance**” and should be disposed of appropriately.



Piping, ducting, vessels and ancillary equipment should be clearly marked in accordance with recognised standards to minimise exposure to persons.

Other ways to reduce exposure to hazardous substances include:

- removing a non-essential hazardous material
- using a less hazardous material or the same substance in a less hazardous form or process
- separating a process from people by distance or by barriers like separating the area for mixing and preparing chemicals with limited access
- using machinery, equipment or processes that minimise workplace contamination by containing or removing hazardous material
- changing the way that people do the job or having procedures about how to do the job safely, like limiting the period of exposure for a worker
- providing personal protective equipment or clothing like respirators, gloves or eye protection that is suitable for the material, the task of the operator, fitted to the worker and complies with relevant Australian Standards.

Substances classified as dangerous goods should be transported and stored according to dangerous goods safety management legislation.

## 5.10 Outdoor working

When working outdoors, a significant risk is exposure to ultra-violet (UV) radiation from the sun, and excessive heat and humidity. Exposure to cold conditions can also be an issue.

### Hazards from outdoor working

The main risks associated with outdoor working in a sawmill:

- Exposure to sunlight - may cause eye damage or skin damage and skin cancer.
- Excessively high temperatures and humidity - may cause nausea or vomiting, dizziness, muscle cramps, mental confusion (these can be symptoms of heat exhaustion or heat stroke, which can be fatal).
- Very low temperatures at certain times of day during winter months can lead to pulled muscles and tendons and lack of concentration.

### Control measures for outdoor working

- Rescheduling outdoor work programs, where possible, to be performed outside the hours of greatest sun intensity (10 am to 2 pm), or coldest parts of the day.
- Rotating tasks to allow workers some time in shady cooler areas.
- Making maximum use of natural shade from the trees, buildings and other structures.

- Advising individuals at particular risk, and ensuring that all workers whose work involves direct exposure to sunlight make maximum use of personal protection against the hazards of solar ultraviolet rays.
- Informing employees of the symptoms of heat induced illness, such as heat exhaustion or heat stroke, and of the signs of dehydration and allowing rest breaks to cool down for anyone experiencing symptoms.
- After steps have been taken to minimise exposure, the next step is using adequate protective clothing. Key features for selecting appropriate clothing include the design, tightness of weave and permeability of the material to assist evaporation of sweat. Non-reflective darker colours are preferable to white garments.
- Ensure that using personal protection itself does not create a secondary hazard to a worker. Impermeable materials, such as plastic lined disposable overalls, do not allow sweat to evaporate and will increase heat stress in hot climates. Take particular care to ensure that loose fitting clothing is not worn near plant or machinery with moving parts.
- For adequate head and face protection, hats with brims of 10-12cm should provide enough shade, but will not stop solar rays reflecting up from water, corrugated iron and aluminium sheeting surfaces. Ultraviolet eye protection that complies with current Australian Standards can be used.
- When selecting shirts and trousers they should be selected with an Ultraviolet Protection Factor (UPF) rating of 40 to 50+. Particular care must be taken to ensure that loose fitting clothing is not worn near plant or machinery with moving parts.
- As well as suitable clothing, sunscreen should be used when appropriate. Broad-spectrum sunscreens rated at a factor of at least SPF 15+ should be applied to dry skin 15 to 30 minutes before going out into the sun and reapplied every two hours.
- Fresh clean drinking water must be available at all times but may be supplemented by commercially available drinks designed to replace the minerals lost by dehydration.
- Warm clothing should be worn during cold temperatures and to avoid workers wearing jackets over high visibility clothing, consider providing warm high visibility clothing for workers.
- People can absorb 150 mL to 250 mL of water every 15 to 20 minutes. It is recommended that before starting work 500 mL (half a litre) is consumed to ensure full rehydration from the previous day.

## 5.11 Pressure vessels

Pressure vessels commonly found in sawmills include:

- Fired pressure vessels:
  - boilers
- Unfired pressure vessels:
  - treatment plant
  - air receivers
  - compressors
  - compressed gas cylinders (oxygen, acetylene, lpg, etc.)
  - vacuum vessels
  - associated pressure piping.

### Hazards associated with pressure vessels

Two consequences of a complete rupture of boilers and pressure vessels:

- Blast effects due to sudden expansion of the pressurised fluid.
- Fragmentation damage and injury, if vessel rupture occurs.

For a leakage failure, the consequences can range from no effect to very serious effects:

- Suffocation or poisoning, depending on the nature of the contained fluid, if the leakage occurs into a closed space.
- Chemical and thermal burns from contact with process liquids.

#### **Control measures for pressure vessels**

- Pressure equipment should be designed, installed and tested in accordance with approved standards and should be located in areas that are free from wet, damp, dirty and high vehicle traffic areas.
- Pressure equipment must be commissioned in accordance with the manufacturers specifications.
- Establish a testing and servicing program in which operating controls and safety relief valves are tested and maintained at regular intervals.
- To prevent damage to the valve seats, make sure that safety and relief valves are always tested under pressure in controlled environment.
- Never operate pressure equipment with a malfunctioning safety relief valve.
- Position compressor air intakes away from contaminated atmospheres.
- Install air coolers and air driers to minimise condensate build up.
- Ensure air pressure equipment is drained to avoid condensate build up.
- Always ensure persons are adequately trained to operate and maintain pressure equipment.
- Engage a competent service and inspection agent to check and service pressure equipment.
- A boiler log book must be kept for boiler operation.
- Records of commissioning and all maintenance work performed on pressure equipment must be kept.

#### **Control measures for air compressors**

- The following should be considered for the safe operation air compressors:
  - Pressure gauge and pressure relief valves (safety valve) and tested regularly.
  - Guarding of pulleys, drive belts and drive couplings and exposed drive shafts.
  - Air intakes to be positioned so that only clean uncontaminated air enters the compressor, and air filters installed on compressor intakes.
  - Lubrication in accordance with manufacturers specifications.
- Air pressure vessels should be drained daily to reduce condensate.
- Before carrying out repairs on any pressure components, they should be isolated and bled.
- Where compressors start automatically, signage should be displayed on the compressor to warn persons of the automatic starting feature.
- Regular maintenance checks need to be performed on all compressors and safety devices according to manufacturer's specification. A maintenance log should be kept for the life of the compressor.

#### **Registration of plant design and plant**

Pressure equipment with hazard level A, B, C or D as worked out under the criteria stated in Australian Standard 4343, will require registration of plant design and registration of plant. Pressure equipment such as boilers, treatment vessels and air receivers will generally fall into one of these hazard levels.

#### **Operator licensing**

Steam boilers are generally classified for operation purposes having regard to their mode of operation as being unattended, limited attendance or fully attended boilers. Operators must be

properly trained and competent to carry out the duties in connection with such plant. Operators of certain steam boilers require a license:

**Boiler operation licences**

BA	Advanced boiler operator
BB	Basic boiler operator
BI	Intermediate boiler operator

## 5.12 Compressed air

Hazards associated with the use of compressed air include:

- Injection into the body
- Projectiles
- Air quality

### Control measures for the use of compressed air

- When using compressed air:
  - high pressure compressed air (above 50 kpa) should not be directed towards a person
  - safety chains or safety locking devices to be utilised on all air hose connections
  - precautions should be adopted when using compressed air for cleaning purposes, to prevent the movement of projectiles or combustible dusts if such action could lead to fire or dust explosion
  - operator should stand to one side of a tyre while it is being inflated.
- Compressed air must not be used for respiratory equipment unless designed for that purpose.

## 5.13 Isolation and lockout procedures

Positive isolation is achieved by separating from the energy source and de-energising of stored energy. Isolation integrity is maintained by a means of lockout or tag out system.

Equipment must be isolated from hazards when maintenance, repair or cleaning is undertaken or when an unexpected operation may cause injury, such as when un-jamming timber.

Energy sources requiring isolation may include electrical, mechanical, thermal, steam and/or gas, pneumatic, hydraulic, potential, kinetic and stored energy.

### Controls for isolation

1. The aim of isolation is to eliminate or minimise the risks associated with all sources of energy whenever work involving removal, replacement, repair or other similar activity is performed on plant. Before such activity takes place, all energy sources must be positively isolated and tagged or locked out.
2. Isolation procedures may be required:
  - when plant is suspected of being in a hazardous condition (such as malfunctioning, broken or damaged)
  - following an incident when it is necessary to isolate plant
  - during setup, tooling/blade changing, and commissioning or decommissioning
  - for routine inspection, repairs, maintenance or cleaning.
3. Before any work involving removal or repair of plant, breaking into lines and systems or any other task that may involve exposure of workers to hazards, an assessment of the risks should be conducted and appropriate controls implemented.

4. Where significant risks have been identified, safe work procedures should be prepared with specific details for identified hazards such as energy sources, movement by other forces such as gravity, moving loads and/or energy.
5. Before commencing work on plant, all isolations, lock outs and testing should be performed by competent persons.
6. Where isolation procedures are implemented often for particular plant, such as for routine replacement or maintenance, standard work procedures could be developed and used as required.
7. All affected personnel should be notified before re-energising.
8. Training in relation to isolation procedures should be conducted as required, to ensure competency. Isolation procedures should be periodically reviewed or when plant is modified or replaced or new plant is introduced.
9. Trouble shooting, fault finding, calibration or adjustment etc. around live equipment where isolation and lockout procedures cannot be implemented will require additional working procedures. This type of work should only be conducted by competent persons.

## 5.14 Electrical

Electrical hazards:

- Electrical shock or electrocution from portable and fixed plant
- Arcing of electrical components
- Dust explosions from electrical arcing
- Fire associated with arcing of electrical components.

The [Electrical Safety Regulation 2002](#) has different requirements for electrical safety management, including testing and inspection of equipment and safety switch protection. The two classes of work relevant to a sawmill include manufacturing work requirements and service work or office work requirements.

### **Manufacturing work – electrical safety requirements**

Employers and self-employed people must make sure:

- double adaptors and piggyback plugs are not used
- specified electrical equipment is inspected, tested and tagged by a competent person at prescribed intervals **and**
- specified electrical equipment is connected to a type 1 or 2 safety switch. This must be an installed safety switch from 1 March 2008. From 1 March 2008, portable safety switches became mandatory for manufacturing industry
- safety switches are tested at prescribed intervals
- any electrical equipment is immediately withdrawn from use if it is not safe to use
- safety switches are withdrawn from use if they are not working properly.

### **Service work and office work - electrical safety requirements**

Employers and self-employed people must make sure:

- specified electrical equipment is inspected and tested by a competent person at prescribed intervals and immediately withdrawn from use if it is not safe to use **or**
- specified electrical equipment is connected to a type 1 or 2 safety switch. The safety switch must be tested at prescribed intervals and withdrawn from use if it is not working properly.

### **Control measures for electrical hazards**

The *Electrical Safety Act* and associated *Electrical Safety Regulation, Code of Practice for Electrical Work* and Australian Standard 3000-2000 highlight a number of controls to guard against electrical hazards as follows.

#### **Live power lines or pole transformers in areas**

- Consultation with the entity or persons in control of live power line to determine the height, voltages and whether power lines are insulated or bare and exclusion zone applicable when workers have to perform work in the proximity of energised power lines.
- Determine maximum elevated height of the plant and equipment when items of plant are required to undertake work near energised power lines.
- Consultation with the entity to address the possibility of raising and/or re-routing the powerlines, placing the cables underground or removing of power lines, when items of plant and equipment are required to work within the designated exclusion zone.
- Development of a safe system of work when plant and equipment is required to work within the designated exclusion zone of overhead energised head power lines.

#### **Main electrical power room, switch board and distribution boards**

- Appropriate signage (e.g. Danger Electrical Power, Restricted Entry) or main power switch board room switch board and distribution board warning persons of the danger associated with entering the switch room or working in close proximity of the main switch board and/or distribution boards.
- Main switch board and distribution boards installed in an area which is well ventilated and dry environment.
- Access to the main switchboard room and distribution boards free from obstructions to a minimum distance 600 mm clearance in front of the board.
- Identification of isolators, circuit breaker and fuses.
- Access prevented to live parts within the main switch board and distribution board.
- Provision for isolator to have a tag and/or lock attached to indicate that it is isolated.

#### **Plant and equipment**

- An identifiable isolation and lockout point for the purpose of interrupting the main power supply to plant and equipment.
- Emergency stop, which is labelled and has to be reset manually and is tested regularly, fitted to electrical plant and equipment and positioned within the zone of reach of operators or any place where there is a risk to a person's health and safety.
- Electric plant clearly identified and marked (e.g., drive motor waste conveyor).
- Conduct regular inspections of electrical equipment to identify defective items.

#### **Cabling and electrical fittings/general**

- Checks to ensure cabling is correctly secured, protected and terminated and free of visual defects.
- The removal or the correct termination of redundant cables.
- Checking of electrical switch outlets and light fittings for correct class and rating for the hazards presented in their environment.
- Checking of electrical switch outlets and light fittings for damage.
- Install mechanical protection for fittings at risk of damage.
- Conduct periodic inspections of cabling and equipment for signs of mechanical damage.

### **General work tools and extension leads**

- Extension cord sets and flexible cables located where they are protected from damage.
- Electrical work tools and extension leads free of damage and if not, removed from service and tagged as unsafe.
- Persons trained on the safe use of electrical equipment, including the need for the removal from service if damaged.

### **The following safe work practices should be promoted within workplaces:**

- Check equipment for possible faults before switching it on.
- Report any electrical faults to your supervisor immediately.
- Check electrical leads for damage including exposed wires and broken insulation.
- Keep leads off the ground.
- Leave electrical repairs to qualified electricians.
- Test electrical safety switches using inbuilt test buttons.
- Conduct periodic checks on safety related controls and interlocks (Australian Standard 4024).

## **5.15 Pipeline marking and colour coding**

The objective of the base identification colour is to provide immediate information about the contents of the pipe.

### **Hazards associated with unmarked pipelines**

- Unidentified contents:
  - harmful substances
  - flammable substances
  - pressurised substances.
- Mistaken identification of contents.

### **Controls for pipeline identification**

#### **Colour coding of pipework**

- a) Water—the distinction is made between pipes primarily carrying water, for instance potable, mildly contaminated waste, cooling/heating, which will be green, and solutions of other materials in water such as foodstuffs and organic waste, which in most cases will be black.
- b) Timber treatment/preservatives – these are black in colour.
- c) Air and other gases—the distinction is made between pipes carrying only air, for instance compressed, vacuum, ventilation, which will be light blue, and all other gases, including pneumatic transport of particulate solids, which may be yellow-ochre or violet.
- d) Fire services—these are coloured red even though they carry a material that could be classified elsewhere.
- e) Oil, fuel, lubricating oils, petrol, diesel and other light fraction fuels (combustible liquids) – these are coloured brown.
- f) Telephone and other communication circuits – these are coloured white.

**Pipe identification markers:** Pipe markers comprise either a printed label that can be affixed to a pipe or the equivalent colours and information sign written directly onto the pipe or incorporated into the pipe at manufacture. The markings comprising either bands of base identification colour or pipe markers as required shall be located adjacent to all junctions, valves, service appliances, wall penetrations and the like, and at spacings not greater than 8 m

along the service. An exception will be for uninterrupted lengths of external services, visible along their length, where the spacing of the identification shall not exceed 50 m.

## 5.16 Asbestos

### Asbestos hazard

Asbestos has been proven to cause cancer and mesothelioma from fibres being inhaled into the respiratory system.

While asbestos is now banned from use, it was a component of thousands of different products used in the community and industry from the 1940s until the late 1980s. Some uses of chrysotile asbestos products, mainly friction materials and gaskets continued until 2003. Materials that contain asbestos can be found in buildings, workplaces and dwellings built before 1990. Even in buildings, workplaces and dwellings built after 1990 it is possible that items installed within them can contain asbestos.

### Controls for asbestos

The *Workplace Health and Safety Regulation 2008* calls up the national codes of practice for asbestos:

- *Code of Practice for the Management and Control of Asbestos in Workplaces*
- *Code of Practice for the Safe Removal of Asbestos*

Any work being done on, or the removal of, asbestos containing material (ACM) must be done in accordance with these codes.

### Asbestos management of buildings and structures

Under the *Workplace Health and Safety Regulation 2008* and asbestos management code, owners of the following structures have certain obligations:

- Buildings built under approvals given by local governments before 1 January 1990.
- Non-building structures where there is ACM fixed or installed (e.g. fixed plant).

Owners are required to:

- Develop, implement and maintain an asbestos register
- investigate the premises for the presence or possible presence of ACM.
- assess the condition of any ACM that are found and the associated asbestos risks
- develop measures to remove the ACM or otherwise to minimise the risks and prevent exposure to asbestos
- ensure the control measures are implemented as soon as possible and are maintained as long as the ACM remain in the workplace
- develop, implement and maintain an asbestos management plan.

Under Part 7 of the asbestos management code, owners are also required to:

- consult with people at the workplace who may be affected by the presence of ACM, for example, employers, workers, contractors and occupants
- provide information and training for workers, contractors and other people who may come into contact with ACM. The training may include procedures to be followed to prevent exposure, the types and locations of asbestos and the health risks of asbestos.

Owners must ensure that, as far as practicable, all ACM in the workplace are identified, assessed and documented in a register for asbestos containing material. Even if no asbestos is found, a register should still be kept that records this fact.

Where it is not practicable to confirm the presence of asbestos, the owner can presume material contains asbestos and must record it as such in the register.

The identification and assessment of asbestos containing material must be performed by a competent person who:

- has appropriate training, knowledge, experience and skill in identifying and assessing asbestos materials
- is familiar with building and construction practices to determine where asbestos is likely to be present
- is able to determine whether material is friable (easily broken) or bonded and assess its condition.

### **Prohibitions**

The *Workplace Health and Safety Regulation 2008* and sections 11.6 and 11.8 of the asbestos management code prohibit the use of certain tools and work methods when working with ACM, as they can generate dangerous airborne asbestos fibres. These prohibitions include the use of:

- high-speed abrasive power and pneumatic tools
- high-pressure water cleaners
- compressed air or abrasive blasting
- household vacuum cleaners, even if they have a HEPA filter. Only vacuum cleaners specifically designed for safe work with asbestos may be used.

For full details of prohibited activities with asbestos refer to Sections 11.6 and 11.8 of the asbestos management code

## **5.17 Lasers**

Lasers can be used to assist in aligning logs on log carriages. The low-powered lasers used in industry usually emit light in the form of a narrow, concentrated light beam. 'Radiation' from the type of lasers used in the manufacturing and construction industry refers to the light beam emerging from it. The wavelength (colour) of this light (radiation) is usually confined to the visible or to the invisible near infrared parts of the spectrum.

### **Laser hazards**

The system of classification of laser devices is specified in Australian Standard 2211. There is a system of classification that ranks the potential hazards of lasers. Most lasers used in sawmills will be of the lower classification:

1. Class 1 lasers are safe for use under all conditions of exposure. The output power is below the level at which it is believed eye damage will occur and the laser may therefore be considered eye safe.
2. Class 2 lasers are low-powered lasers, the use of which requires some administrative controls but present little hazard, such that eye protection is normally afforded by normal blink and aversion responses. A person receiving an eye exposure from Class 2 laser, accidentally or as a result of deliberate action, will be protected from injury by the natural blink effect. Although the risk of a permanent eye injury from a Class 2 laser is low, an individual receiving even a transient eye exposure will experience a bright flash, a dazzling effect which is likely to cause distraction and temporary loss of vision in the affected eye and possible after images. The time taken to recover from these affects will vary for different individuals and will also be dependent on the ambient light level at the time of exposure. Medical attention would only be sought after images persist for hours, or if a disturbance in reading vision is apparent.

3. Classes 3 and 4 lasers emit higher levels of light, and their use requires more stringent engineering and administrative precautions than those necessary for lower class lasers.

### **Control of laser associated risk**

The risk of injury from lasers can be reduced by minimising the chance of exposure to the laser beam likely to cause injury. Making people aware of the level of likely risk can be achieved through appropriate signage and training. Other controls should include:

1. preventing access to the beam during maintenance
2. minimising reflections from shiny mirror-like surfaces
3. ensuring beam stops are utilised
4. positioning the beam so that it is at eye level
5. ensuring a safe work practice is developed and implemented.

All laser devices must have appropriate information about their safe use. This generally takes the form of a label with both the classification details and the applicable warnings for each particular classification. The warning label appropriate to class should be permanently affixed to the housing in a highly visible position. Warning signs are required for all laser installations.

The extent of personnel training required will be dependent on the complexity of the laser installation, the tasks to be undertaken and the availability of suitable personnel.

## **5.18 Amenities**

The *Workplace Health and Safety Regulation 2008* sets out the requirements for:

- toilets
- hand washing facilities
- drinking water
- dining facilities
- dressing rooms
- showers
- first aid
- lighting
- ventilation
- work areas and airspace.

The obligation to provide amenities is on the relevant person who is an employer, who must:

- maintain all amenities they provide in a hygienic, safe and serviceable condition and ensure that there is a system for:
  - inspecting and cleaning the amenity
  - the adequate and hygienic disposal of the sanitary items for women.
- ensure that first aid equipment is:
  - reasonably available
  - appropriate and adequate for the type of work and the people doing the work
  - hygienic, safe and serviceable.
- ensure there is appropriate, safe and clear access to and from the workplace and that all other means of access are safe and clear.

For workplaces where the relevant person who is an employer provides a building for a worker, the employer must ensure:

- toilets, hand washing facilities, drinking water, dining facilities, dressing rooms and showers (in certain circumstances) are reasonably available

- such amenities are maintained
- the amenities comply with the regulation relevant to the amenity and meet the performance requirements outlined on the following pages
- the building which is the workplace complies with the stated building requirements.

For workplaces where the relevant person who is an employer does not provide a building, the employer must ensure:

- to the greatest practicable extent that a toilet is reasonably available
- that the following are reasonably available to the worker:
  - an adequate supply of clean water and soap or another cleansing agent suitable for washing the workers' hands
  - facilities to dry the workers' hands
  - a sheltered area to eat meals and take breaks
  - a shower (under certain circumstances).

## 5.19 Information and training

### Information

- A safe work procedure should be prepared for each work centre, detailing known hazards and safe work practices associated with the task.
- Operators and maintenance manuals should be available and followed for specific plant (usually provided with purchased plant).
- Evacuation procedures should be in place. See chapter 5.23 – Emergency planning.

### Induction

Induction training must be provided to workers at the commencement of their employment in timber industry activities. Induction training is also required for contractors working onsite and for visitors (apart from those attending the office only) unless they are accompanied by an inducted employee.

Induction training consists of:

1. **general induction**, which provides information on the health and safety risks commonly encountered and the common methods of ensuring work can proceed with a minimum of health and safety problems
2. **site specific induction**, which includes information on the site specific hazards, methods of work and any health and safety requirements of the relevant person who is an employer and owner of the site (which may be incorporated with the general induction)
3. **work centre induction**, which details how to perform specific work centre duties, including knowledge of safe work procedures.

### Competency training

A relevant person who is an employer must ensure that their workers are competent in all work functions they will be expected to undertake. Employers must use nationally recognised industry competency standards and assessment procedures (where available) to determine, certify and record worker competency.

### Workplace health and safety training

General workplace health and safety (WHS) training for workers in sawmills should include training in:

- workers responsibilities in relation to WHS
- hazard and incident reporting

- health related risks
- machine hazards
- emergency procedures including fire
- selection, fit, use and maintenance of personal protective equipment
- their role in the consultation process.

Managers and supervisors should be trained in:

- their responsibilities under current legislation
- their involvement in the consultation process, including facilitating worker consultation
- incident and accident reporting duties and record keeping
- information provision and training requirements
- supervisory duties.

### **Record keeping associated with training**

Records should be kept for all staff, including induction, training and assessment associated with all tasks, and operation of plant and equipment.

## **5.20 Personal protective equipment**

### **Controlling risk with personal protective equipment**

Personal protective equipment should only be used when it is not practicable to use other methods to control risks. Design, substitution and separation are generally better methods to control risks. Administrative controls are also often preferable to personal protective equipment.

However, personal protective equipment is often an appropriate choice. This section gives guidance on personal protective equipment to be used in the timber industry. Before commencing work in the timber industry, the relevant person who is an employer must assess the conditions likely to affect the health and safety of people employed to carry out the work and arrange for the provision and use of appropriate protective equipment. Consider:

- the nature and degree of exposure to risk
- the protection offered by equipment selected
- the fit of such equipment for the wearer
- wearability and comfort
- the length of time the equipment is to be worn
- the ease of maintenance and availability of replacement parts where applicable
- the limitations on performance of equipment.

Workers are more likely to happily wear items of personal protective equipment if they are consulted on the choice and fit and if the equipment is comfortable.

The relevant person who is an employer must also ensure all those who wear, issue or service personal protective equipment are trained for these tasks. Training should include:

- information on the risk that the personal protective equipment is to protect against
- the type of protection afforded by such equipment
- the reason for selection of particular equipment and its limitations and capabilities
- compliance with requirements of relevant material safety data sheet
- the importance of proper fit, use and maintenance of protective equipment.

## Personal protective equipment requirements

The relevant person who is an employer must ensure personal protective equipment is clean and operational when it is supplied for use and defective personal protective equipment is not used. Many items of personal protective equipment have a limited life from the manufacture date as defined by the relevant Australian Standard. Many items will no longer meet the Australian Standard after damage from impacts, adhesives, paint, fuel, oils, corrosive substances, excessive heat, etc.

<b>Helmets</b>	An industrial safety helmet and appropriate accessories conforming to current Australian Standards must be used by each person exposed to the risk of head injury. Helmets must be worn at all times in a hard hat area.
<b>Protective footwear</b>	Protective footwear, conforming to current Australian Standards must be worn by any person while engaged in activities where there is a likelihood of a crush injury to the foot. Protective footwear must be replaced when it no longer provides the protection intended.
<b>Hearing protection</b>	Hearing protection should be worn at all times a person is exposed to risk. All people must wear hearing protection where exposure to noise exceeds 85 dB(A). The hearing protector must be chosen with regard to the level of protection required in consideration of the level of noise exposure. Hearing protectors must comply with current Australian standards.
<b>Leg protectors</b>	Cut proof trousers or chaps must be worn by any person exposed to risk of injury from accidentally touching the legs with a chainsaw. They must be replaced when they no longer provide full protection.
<b>Safety gloves</b>	Gloves conforming to Australian Standards and appropriate to the task must be worn by any person requiring hand protection (eg. when using wire ropes). Care should be taken when making the decision to wear gloves as they may increase the risk of gloved hands being caught by the rough surface and dragged into equipment such as saws.
<b>Eye protection</b>	Eye protection conforming to Australian Standard 1336 - Recommended practices for occupational eye protection - should be used by any person who is exposed to risk of injury to the eyes, such as being struck in the eye by flying dust or woodchips or when handling chemicals. Eye protection should be safety glasses, goggles or full face shields appropriate to the risk. Prescription glasses may not meet this standard.
<b>High visibility clothing</b>	An outer garment made of highly visible materials should be worn at all times when a person is working in a sawmill. Highly visible reflective clothing must be worn for night work. They should be close fitting or tucked in to avoid entanglement in machinery.
<b>Respiratory protective devices</b>	Where people engaged in the timber industry are exposed to dust or fumes that may be injurious to their health, suitable respiratory devices should be used. When chemicals are used, personal protective equipment and respiratory protective equipment must be used in accordance with the appropriate material safety data sheet.

## 5.21 Accidents, incidents and injuries

Effective workplace health and safety (WHS) management aims to prevent accidents, incidents and injuries therefore their occurrence signifies a failure in the WHS management system. Identifying where the failure lies and reviewing the relevant procedures and policies to correct any deficiencies is essential and has three main components:

- (a) WHS accident, incident and/or injury recording and data analysis
- (b) accident/incident investigation
- (c) WHS accident, incident and/or injury reporting

**(a) WHS recording and data analysis**

While an effective WHS management system is based on pro-active measures to prevent accidents and injuries, it should also include methods to identify failures and learn from them. Collecting and analysing health and safety data is a key part of a health and safety management system. Events that should be recorded are:

- **Injuries or illnesses** - directly resulting from work.
- **Incidents** - includes accidents, equipment failure, fire, substance release or other event that result in damage to or loss of, plant and equipment, processes, environment and structures.
- **Near misses** - events that, but for chance, could have caused an injury, illness or incident.

The relevant person who is an employer should encourage workers to report all of the above events, regardless of the amount of damage or injury. While recording and analysis of WHS data can give an overall picture of less obvious or otherwise unidentified problem areas or failures in WHS systems and allow for appropriate strategies or actions to be taken to improve health and safety, the emphasis should be on prevention of these events rather than reaction to them as a method of improvement.

**(b) Accident/incident investigation**

Accidents and incidents must be investigated to get factual information that can be used to prevent recurrences. Any accident, especially those involving personal injury or environmental damage, must be investigated as soon as possible after the event and before the scene of the event is disturbed. The scope of investigation should be in proportion to the accident's seriousness or potential for seriousness and could be conducted by a person/persons competent in investigation techniques and/or with skills relevant to the event (such as safety officer, safety representative, supervisor operator).

The investigator/s may have to obtain or refer to photographs, witness statements, copies of relevant documents, training records, maintenance records, etc.

While recording an incident will record the date and type of incident, people and equipment involved and the immediate cause, an investigation should also look at the underlying causes and contributing factors that allowed the event to happen including:

- existing controls or systems which failed to prevent the event from happening and therefore need reviewing to prevent the event from recurring
- new controls or systems which need to be introduced in order to prevent the event from recurring
- deficiencies in training or information that need to be addressed
- changes in work processes or procedures that need to be implemented
- failures of plant or equipment which need to be addressed and prevented from recurring
- changes to company policies which may be required.

The investigation should detail the findings and recommend any action required, by whom, and by when. Any procedural or other changes must be notified to all concerned and reviewed for their effectiveness.

**(c) WHS reporting**

The occurrences below have to be reported to Workplace Health and Safety Queensland within 24 hours, using the approved official form. The scene of the occurrence is not to be interfered with, unless to prevent further injury to persons or damage to equipment, without permission of an inspector (or a police officer).

A copy of the incident notification form to be completed (Form 3) is included as Appendix 5 and the current form is available from any office of Workplace Health and Safety Queensland, or on the [website](#).

## 5.22 First aid

A relevant person who is an employer must provide first aid facilities that are:

- appropriate and adequate for the workers and the type of work done at the workplace
- reasonably accessible to all employees
- maintained in a hygienic safe and serviceable condition.

The *First Aid Code of Practice* states ways to manage first aid at a workplace and a relevant person who is an employer must do what the code says or adopt and follow a way that gives equal or better protection.

A risk assessment will determine requirements associated with:

- selection, location and maintenance of first aid facilities
- policies and procedures associated with the use of first aid services and facilities
- selection and training of first aid personnel.

To ensure first aid facilities are appropriate for the workplace, the relevant person who is an employer must also consider:

- the nature of the work performed and the possible injuries or diseases needing treatment
- the location, layout and size of the working area
- the distribution of workers.

## 5.23 Emergency planning

A relevant person who is an employer must develop procedures to ensure they can deal with accidents and emergencies. These procedures should include:

- means by which serious traumatic injury cases receive earliest possible access to treatment
- means by which all persons in the workplace can be accounted for
- availability of suitable emergency equipment and materials to enable outcome minimisation of a possible accident/emergency; arising from accident or illness, fire, substance release, bomb threat, or terrorist threat.
- appropriate training of workers in accident/emergency procedures.

The emergency procedures must be documented. The relevant person who is an employer must ensure all workers are aware of these procedures. Implement fire safety procedures and provide appropriate fire fighting equipment. Fire extinguishers and hoses should be easily seen and accessible. Workers should be trained in the use of the fire fighting equipment.

Emergency procedures should be in place in the event that there is a fire in the sawmill or in neighbouring premises. Workers should be familiar with the emergency response in case of fire, including emergency procedures and escape routes. Regular fire drills should be practiced. Emergency plans should include a procedure to provide prompt treatment for burns and smoke inhalation. See chapter 5.27 – Fire safety for further advice and information.

## 5.24 Workplace Health and Safety Officers

Under the Workplace Health and Safety Act, if there are normally, or are likely to be, 30 or more employees at a workplace, for more than 40 days in the current year, then a qualified workplace health and safety officer (WHSO) must be appointed for the workplace. The person appointed must hold a Certificate of Authority to function as a WHSO from Workplace Health and Safety Queensland, which can only be obtained after completing the approved training. An appropriately qualified employer may also be appointed as the WHSO.

A WHSO may be appointed for more than one workplace, with written approval from WHSQ, if they can reasonably carry out their functions at each workplace.

The Act sets out the main functions of a WHSO:

- Report to the employer about the overall state of health and safety at the workplace
- Conduct inspections and report in writing on any hazards or unsafe practices discovered.
- Establish appropriate WHS educational programs.
- Investigate, or assist in investigations into accidents and incidents at the workplace.
- Assist workplace health and safety inspectors in the performance of their duties.
- Report any incident or workplace risks to the employer.
- Any other function prescribed under a regulation.

Employers are obliged under the Act to take appropriate action to rectify any unsafe practices or conditions identified by the WHSO. Employers must:

- take reasonable action to rectify any hazards or unsafe practices or conditions reported by the WHSO
- provide any WHS information required by the WHSO. Consult with the WHSO regarding proposed changes to the workplace, plant or substances used at the workplace, which may affect health and safety
- provide resources and assistance required to allow the WHSO to carry out their function
- display the name of the WHSO in prominent positions at the workplace within five days of their appointment
- keep any written reports from their WHSO for five years.

## 5.25 Workplace Health and Safety Representatives

Workers may elect a workplace health and safety representative (WHSR) themselves, or at the employer's suggestion. Elected WHSRs are entitled to:

- undertake workplace inspections
- report hazards
- review incidents
- issue [provisional improvement notices](#) (if the WHSR has completed the approved training).

After conducting an internal investigation a WHSR may:

- make recommendations in the [Hazard Report Form 2003](#)
- provide the form to the employer (WHSRs must keep a copy)
- issue a [Provisional Improvement Notice](#) (PIN) depending on the circumstances surrounding the issue being investigated. Extensive consultation usually takes place before and after issuing a PIN notice and before Workplace Health and Safety Queensland is contacted to resolve an issue.

If the issues are not satisfactorily resolved by the WHSO, the employer or self-employed person, the WHSR may notify a Workplace Health and Safety Queensland inspector.

## 5.26 Safety committees

Health and safety committees help workers and employers work together to make a workplace healthy and safe.

A worker can ask for a health and safety committee. Once a worker has asked for a committee, the employer is required by law to appoint one. Employers can also establish a health and safety committee without a worker asking for one.

In some larger workplaces, there can be more than one committee.

Functions of the committee include:

- encouraging and maintaining an active interest in workplace health and safety
- considering training and education needs to address workplace health and safety issues
- keeping workers up to date with new standards, rules and procedures
- reviewing the circumstances surrounding workplace incidents
- helping to resolve issues about workplace health and safety
- providing the employer with advice on how to address workplace health and safety issues.

## 5.27 Fire safety

An owner, occupier or manager of a building is obliged to ensure the safety of any person in that building in the event of a fire or other emergency, under the provisions of the [Fire and Rescue Service Act 1990](#) and/or the [Building Fire Safety Regulation 2008](#). The Queensland Fire and Rescue Service has developed a document to **assist owner/ occupiers in managing their compliance** with the legislation:

- [Fire Safety Management Tool for Owner/ Occupiers](#)
- [Advisory Notes](#)

Under the fire regulations, a Fire Safety Officer is required if there are 30 or more workers employed at the workplace.

Templates are available from [Queensland Fire and Rescue](#) to facilitate the development of a fire and evacuation plan, evacuation signs, training records and fire safety installation checklist. These are in generic form and must be modified to suit the buildings and sawmill site.

## 5.28 Contractors, suppliers and visitors

The safety of all persons on site is the responsibility of the organisation. All contractors, suppliers and visitors must be made aware of the relevant health and safety requirements. They must also be informed of any hazards at the workplace that may pose a risk to their health and safety. The duration and frequency of their visit, and the areas within the sawmill that they visit, will determine the extent of their safety induction. Persons who have not been inducted should be escorted at all times, unless they are confined to areas with low or no risk. Contractors, suppliers and visitors must report to the office on arrival and departure.

**Hazards associated with contractors, suppliers and visitors include unfamiliarity with:**

- environment

- processes and procedures
- safety systems and rules
- plant, equipment and materials.

### **Control measures**

1. Contractor, supplier, visitor sign in book.
2. Induction training including:
  - a. site hazards
  - b. site rules and personal protective equipment
  - c. emergency and evacuation procedures
  - d. incident reporting and first aid
  - e. visitor and contractor responsibility.
3. Restricted access.
4. Supervision and escorting.
5. Work method statements from contractors.
6. Appropriate site signage.

## **5.29 Human behavioural factors**

### **Hazards associated with human behavioural factors:**

- Workplace harassment
- Drugs and alcohol
- Fatigue

### **Workplace harassment**

This definition is intended to cover a wide range of behaviours that can have an adverse impact on the workplace health and safety of workers and other persons. A person is subjected to workplace harassment if the person is subjected to repeated behaviour, other than behaviour amounting to sexual harassment, by a person, including the person's employer or a co-worker or group of co-workers of the person that:

- is repeated, unwelcome and unsolicited
- the person considers to be offensive, intimidating, humiliating or threatening
- a reasonable person would consider to be offensive, humiliating, intimidating or threatening.

Workplace harassment does not include reasonable management action taken in a reasonable way by the person's employer in connection with the person's employment.

Harassing behaviours can range from subtle intimidation to more obvious aggressive tactics:

- Abusing a person loudly, usually when others are present.
- Repeated threats of dismissal or other severe punishment for no reason.
- Constant ridicule and being put down.
- Leaving offensive messages on email or the telephone.
- Sabotaging a person's work, for example by deliberately withholding or supplying incorrect information, hiding documents or equipment, not passing on messages and getting a person into trouble in other ways.
- Maliciously excluding and isolating a person from workplace activities.
- Persistent and unjustified criticisms, often about petty, irrelevant or insignificant matters.
- Humiliating a person through gestures, sarcasm, criticism and insults, often in front of customers, management or other workers.
- Spreading gossip or false, malicious rumours about a person with an intent to cause the person harm.

- Sexual harassment - see the *Anti-Discrimination Act 1991* for further information.

## **Drugs and alcohol**

Alcohol and drug use may contribute to workplace injuries resulting from poor physical coordination, impaired judgement and decreased alertness.

### **Control measures for drugs and alcohol, and harassment**

#### ***1. Consultation***

Consultation between employers, workers and their representatives is essential if the risk to health and safety associated with alcohol and drug use, and harassment, is to be managed. This may occur through a committee with representatives of workers, personnel, health and safety staff, alcohol and drug consultants and management, or through consultation with WHSOs and WHSRs. Professional bodies can assist with advice on program development and implementation to help in the development of a workplace program.

At smaller workplaces, direct discussion with employees and the use of outside resources may be essential.

#### ***2. Development of a workplace policy***

The alcohol, drug and harassment policy that a sawmill adopts will need to take account of the workplace's particular needs and situation. However there are a number of minimum requirements for such a policy. The workplace policy should:

- contain a clear statement of the behaviour that is expected of workers
- apply equally to all workers, including managers and supervisors, at the workplace
- be part of the comprehensive health and safety program
- result from adequate consultation with workers before it is adopted
- be made known to all workers
- address issues in the work environment that may increase harassment or the use of alcohol or drugs
- to the greatest degree possible, be non-punitive
- provide for appropriate treatment and rehabilitation for workers with problems
- be evaluated after implementation and amended, if necessary, in line with the outcome of the evaluation.

## **Fatigue**

Long hours and shift work patterns that disrupt the body's circadian rhythms often result in workers becoming fatigued. Shift work is defined as any work that is conducted outside of the standard 8 am to 6 pm work cycle. Shift work includes:

- permanent night shifts or other permanent shifts that extend into hours that would normally be spent asleep
- compressed work weeks with extra long work days
- rotating work shifts or shifts where workers work permanently on one shift.

Shift workers as a group tend to obtain significantly less sleep, and of a poorer quality, than those who work equivalent hours that do not intrude on the typical sleep period (11 pm to 7 am).

Extended working hours, particularly for shift workers, adversely affect the amount of time available for sleep and social activities. Once a person works more than 48 hours within a week, the increased competition between sleep and other activities results in sleep of a limited

quality and length. As hours of sleep are reduced, the individual begins to accumulate a sleep debt. This causes fatigue levels to rise, which leads to poor effects on health and safety.

### **5.30 Site security**

Sawmills can be attractive targets for vandals, children and thieves. The safety of all persons on site is the responsibility of the organisation therefore the organisation must implement controls to prevent unauthorised access to the site, plant and equipment, substances and materials.

#### **Hazards associated with unauthorised access**

- Unauthorised access
- Injury to unauthorised persons
- Damage to plant, equipment and materials
- Loss of plant, materials and equipment
- Environmental damage

#### **Controls**

1. Security surveillance outside working hours.
2. Security alarm systems.
3. Secure fencing to perimeter of site.
4. Lockable gates on entrances to sites.
5. Warning signs prohibiting unauthorised access.
6. Shut down procedures when site is unmanned including:
  - a) all plant and equipment isolated to prevent operation
  - b) buildings and access to fixed ladders locked and secured against entry
  - c) mobile plant shut down, locked out and keys removed
  - d) kilns and treatment vessels secured shut
  - e) burners not in operation secured shut
  - f) valves on pipelines protected against unauthorised operation
  - g) power tools and small equipment locked away
  - h) fuel bowsers locked out.

# Appendix 1 Checklists

Checklists assist in managing common health and safety risks in the sawmill. The checklists help to identify issues discussed in the relevant parts of chapters 4 and 5 in this guide. The number in front of the title refers to the relevant chapter/part of this guide. The checklists are separately available in excel spreadsheet format, with a summary sheet and separate pages for each topic. [\[Sawmill checklist download\]](#)

The available checklists cover:

## **4. Specific components**

- 4.1 Log handling
- 4.2 Chainsaws
- 4.3 Log debarking
- 4.4 Log carriages and breakdown saws
- 4.5 Saw benches
- 4.6 Docking saws
- 4.7 Round table/green chain
- 4.8 Treatment plant
- 4.9 Kilns
- 4.10 Other fixed plant
- 4.11 Chippers
- 4.12 Conveyors
- 4.13 Powered mobile plant
- 4.14 Blade handling
- 4.15 Portable power tools
- 4.16 Timber yard layout
- 4.17 Platforms, walkways, stairs, ladders
- 4.18 Strapping and stacking timber
- 4.19 Fire pits/waste disposal systems
- 4.20 Sawdust and chip storage

## **5. General health and safety issues**

- 5.1 Manual tasks
- 5.2 Housekeeping, buildings and grounds
- 5.3 Noise
- 5.4 Vibration
- 5.5 Confined spaces
- 5.6 Dust
- 5.7 Hot work and fire precautions
- 5.8 Working at height
- 5.9 Hazardous substances and DGs
- 5.10 Outdoor working
- 5.11 Pressure vessels
- 5.12 Compressed air
- 5.13 Isolation and lock out procedures
- 5.14 Electrical
- 5.15 Pipeline marking and colour coding
- 5.16 Asbestos
- 5.17 Lasers
- 5.18 Amenities
- 5.19 Information and training
- 5.20 Personal protective equipment
- 5.21 Accidents, incidents and injuries
- 5.22 First aid
- 5.23 Emergency planning
- 5.24 WHSOs
- 5.25 WHSRs
- 5.26 Safety Committees
- 5.27 Fire safety
- 5.28 Contractors, suppliers and visitors
- 5.29 Human behavioural factors
- 5.30 Site security

## Appendix 2 Hazard identification register

Workplace area or plant:		Reference no:	
Form completed by:		Signature:	
Date form completed:			
Ref. no.	Identified hazards	Date	Initials
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

## Appendix 3 Risk management form

Workplace area or plant:		Reference no:			
Form completed by:		Signature:			
Date form completed:					
Hazard identification					
<b>Hazard:</b>					
<b>Associated risk:</b>					
<b>Specific circumstances relating to the risk:</b>					
<b>Persons at risk:</b>					
Risk assessment					
<b>Existing control measures:</b>					
<b>Likelihood</b> (tick):	Almost certain <input type="checkbox"/>	Likely <input type="checkbox"/>	Possible <input type="checkbox"/>	Unlikely <input type="checkbox"/>	Rare <input type="checkbox"/>
<b>Consequence</b> (tick):	Catastrophic <input type="checkbox"/>	Major <input type="checkbox"/>	Medium <input type="checkbox"/>	Minor <input type="checkbox"/>	Insignificant <input type="checkbox"/>
<i>(see risk level rating and priority tables following)</i>					
<b>Risk Rating</b> _____		<b>Priority:</b> _____			
Risk level depending on likelihood and consequences:					
Likelihood How likely it is that it will happen	Consequences How severely it could hurt someone (if it happens)				
	Insignificant (no injuries)	Minor (first aid treatment, spillage contained at site)	Medium (medical treatment; spillage contained with outside help)	Major (extensive injuries, loss of production)	Catastrophic (death, toxic release of chemicals)
Almost certain - expected in most circumstances	<b>H</b>	<b>H</b>	<b>A</b>	<b>A</b>	<b>A</b>
Likely – will probably occur	<b>M</b>	<b>H</b>	<b>H</b>	<b>A</b>	<b>A</b>
Possible – might occur	<b>L</b>	<b>M</b>	<b>H</b>	<b>A</b>	<b>A</b>
Unlikely – could occur	<b>L</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>A</b>
Rare - may occur, in exceptional circumstances	<b>L</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>
Priority for action:					
<b>A – Acute</b>	<b>ACT NOW – Urgent - Requires immediate attention.</b>				
<b>H - High</b>	<b>Highest management decision is required urgently.</b>				
<b>M – Medium</b>	<b>Follow management instructions.</b>				
<b>L - Low</b>	<b>OK for now - Record and review as required.</b>				

**Risk management form (continued)****Risk control****Possible control options:**

Elimination:

Substitution, isolation or engineering:

Administration or personal protective equipment:

**Preferred control options (and why):****Implementation plan**

Control option	Associated activities	Resources required	Person(s) responsible:	Proposed implementation date:	Sign off and date	Scheduled review date:

**Review****Are control measures in place?** Yes No, comment (why not):**Are controls preventing or minimising the risk?** Yes No, comment (why not):**Are there any new problems with the risk?** No Yes, comment (what are they):

## Appendix 4 Job Safety Analysis form

<b>Name of organisation completing the work:</b>			<b>Job name:</b>		
<b>Task:</b>			<b>Job number:</b>		
<b>Workplace:</b>			<b>Job location:</b>		
Date JSA prepared:			Number of pages in this JSA:		
This JSA has been reviewed by:			This JSA has been discussed with:		
Signature:			Employee/subcontractor (signature)		
Position		Date	Position		Date
Item No.	Work activity Break the job down into steps	Hazard What could harm someone?	Risk control What can be done to make the job safe?	Persons responsible Who will make sure it happens?	Completion date and signoff

# Appendix 5 Incident notification form

## Incident Notification (Information)

*Workplace Health and Safety Act 1995*

*Electrical Safety Act 2002*

*Dangerous Goods Safety Management Act 2001*



Queensland Government

ABN 13 846 673 994

### What is this form used for?

Certain incidents must be reported, in the approved form, to Workplace Health and Safety Queensland or the Electrical Safety Office. Workplaces must also keep records of particular incidents for a certain time.

### Who must complete the form?

The *Workplace Health and Safety Regulation 2008* requires a person who conducts a business or undertaking, or the appointed principal contractor (for workplaces where the construction work has an estimated final price of more than \$80 000 or is a prescribed activity) to notify Workplace Health and Safety Queensland of a serious bodily injury, work caused illness or dangerous event.

If the workplace incident causes the death of the person conducting the business or undertaking, the next in charge at the workplace must notify Workplace Health and Safety Queensland.

The *Electrical Safety Regulation 2002* requires employers or self-employed persons to notify the Electrical Safety Office or Workplace Health and Safety Queensland of a serious electrical incident or dangerous electrical event.

The *Dangerous Goods Safety Management Regulation 2001* requires the occupier of a major hazard facility to, as soon as practicable, notify the chief executive about a major accident under the *Dangerous Goods Safety Management Act 2001*.

### When is the form to be lodged?

Notification in the approved form (on-line or written) is required within 24 hours of being aware of a notifiable incident happening. Prompt notification (by phone 1300 369 915 or fax 07 3247 0297) is also required if the incident involves a death.

### How to lodge the form

Forms may be faxed to (07) 3247 0297 or

Posted to Assessment Services

Advisory Assessment Centre  
Fair and Safe Work Queensland,  
PO Box 820, Lutwyche, QLD 4030.

For more information please call 1300 369 915 or visit the website: [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au)

### What records must be made of a workplace incident?

A person who conducts a business or undertaking, or the appointed principal contractor (for workplaces where the construction work has an estimated final price of more than \$80 000 or is a prescribed activity) must make a record of an incident that has led to a work injury, work caused illness or dangerous event. The record must be made in the approved form within 3 days of becoming aware of the incident. The record must be kept for 1 year.

Employers or self-employed persons must make a record of a serious electrical incident or dangerous electrical event. The record must be made in the approved form within 3 days of becoming aware of the incident. The record must be kept for 3 years.

### Definitions

**Dangerous electrical event** is any of the following—

- (a) the coming into existence of circumstances in which a person is not electrically safe, if—
  - (i) the circumstances involve high voltage electrical equipment; and
  - (ii) despite the coming into existence of the circumstances, the person does not receive a shock or injury;
- (b) the coming into existence of both of the following circumstances—
  - (i) if a person had been at a particular place at a particular time, the person would not have been electrically safe;
  - (ii) the person would not have been electrically safe because of circumstances involving high voltage electrical equipment;
- (c) an event that involves electrical equipment and in which significant property damage is caused directly by electricity or originates from electricity;
- (d) the performance of electrical work by a person not authorised under an electrical work licence to perform the work;
- (e) the performance of electrical work by a person if, as a result of the performance of the work, a person or property is not electrically safe;
- (f) the discovery by a licensed electrical worker of electrical equipment that has not been marked as required under this Act.

**Incident Notification (Information) continued... page 2 of 4**

**Definitions continued...**

**Dangerous event** means an event caused by specified high risk plant, or an event at a workplace or relevant workplace area, if the event involves or could have involved exposure of persons to risk to their health and safety because of –

- (a) collapse, overturning, failure or malfunction of, or damage to, an item of specified high risk plant; or
- (b) collapse or failure of an excavation or of any shoring supporting an excavation; or
- (c) collapse or partial collapse of any structure; or
- (d) damage to any load bearing member of, or the failure of any brake, steering device or other control device of, a crane, hoist, conveyor, lift or escalator; or
- (e) implosion, explosion or fire; or
- (f) escape, spillage or leakage of any hazardous material or dangerous goods; or
- (g) fall or release from a height of any plant, substance or object; or
- (h) damage to a boiler, pressure vessel or refrigeration plant; or
- (i) uncontrolled explosion, fire or escape of gas or steam.

**Serious bodily injury** is a work injury that causes—

- (a) the injured person's death; or
- (b) the loss of a distinct part or an organ of the injured person's body; or
- (c) the injured person to be absent from the person's voluntary or paid employment for more than 4 days.

**Serious electrical incident** is an incident involving electrical equipment if, in the incident—

- (a) a person is killed by electricity; or
- (b) a person receives a shock or injury from electricity, and is treated for the shock or injury by or under the supervision of a doctor; or
- (c) a person receives a shock or injury from electricity at high voltage, whether or not the person is treated for the shock or injury by or under the supervision of a doctor.

**Major accident under the *Dangerous Goods Safety Management Act 2001* (DGSM Act)** is a sudden occurrence (including, in particular, a major emission, loss of containment, fire, explosion or release of energy) leading to immediate or delayed serious harm or with the potential for serious harm from hazardous materials. Serious harm is harm that —

- (a) causes the death of a person; or
- (b) impairs a person to such an extent that because of the harm the person becomes an overnight or longer stay patient in a hospital; or
- (c) results in costs of more than \$50,000 being incurred to prevent, minimise or repair harm to property or the environment.

**Major hazard facility** is a facility that is classified by the chief executive under Part 4 Division 1 of the DGSM Act.

**Work caused illness** means—

- (a) an illness contracted by a person to which a workplace, a relevant workplace area, a work activity, or plant or substances for use at a relevant place was a significant contributing factor; or
- (b) the recurrence, aggravation, acceleration, exacerbation or deterioration in a person of an existing illness if a workplace, a relevant workplace area, a work activity, or plant or substances for use at a relevant place was a significant contributing factor to the recurrence, aggravation, acceleration, exacerbation or deterioration.

**Work injury** is—

- (a) an injury to a person that requires first aid or medical treatment if the injury was caused by a workplace, a relevant workplace area, a work activity, or plant or substances for use at a relevant place; or
- (b) the recurrence, aggravation, acceleration, exacerbation or deterioration of an existing injury in a person if –
  - (i) first aid or medical treatment is required for the injury; and
  - (ii) a workplace, a relevant workplace area, a work activity, or plant or substances for use at a relevant place caused the recurrence, aggravation, acceleration, exacerbation or deterioration; or
- (c) any serious bodily injury, if the injury was caused by a workplace, a relevant workplace area, a work activity, or plant or substances for use at a relevant place.

**NOTE: Notification to Work Cover is not a notification to Workplace Health and Safety Queensland.**

**If you have any questions about filling out the form, please call 1300 369 915.**

**Where an option is provided to answer a question, mark selection with X.**

**Please print and keep a copy of this form for your own records before submission.**

---



**Incident Notification continued... page 4 of 4****© About the injury / illness**

Injury or illness description (e.g. fracture, laceration, amputation, strain, electrical shock, burn, Q fever)

What part of the body was injured (e.g. right leg, lower back, chest)

As a result of the incident was the person – (tick all boxes that apply)

- Unconscious  Resuscitated  
 Hospitalised  Fatally injured

Please provide hospital details below

**D About the employer, self employed person, principal contractor or major hazard facility**

Legal name

Trading name

Main business address

Postcode

ABN

Business phone number

Business fax number

Business email address

Main business activity (e.g. furniture manufacture, domestic construction, steel warehousing, electrical installation)

Main industry sector

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Education and training          | <input type="checkbox"/> Agriculture, forestry and fishing | <input type="checkbox"/> Information media and telecommunications        |
| <input type="checkbox"/> Mining                          | <input type="checkbox"/> Transport, postal and warehousing | <input type="checkbox"/> Rental, hiring and real estate services         |
| <input type="checkbox"/> Manufacturing                   | <input type="checkbox"/> Financial and insurance services  | <input type="checkbox"/> Electricity, gas, water and waste services      |
| <input type="checkbox"/> Construction                    | <input type="checkbox"/> Public administration and safety  | <input type="checkbox"/> Professional, scientific and technical services |
| <input type="checkbox"/> Wholesale trade                 | <input type="checkbox"/> Health care and social assistance | <input type="checkbox"/> Administrative and support services             |
| <input type="checkbox"/> Retail trade                    | <input type="checkbox"/> Arts and recreational services    | <input type="checkbox"/> Accommodation and food services                 |
| <input type="checkbox"/> Other services (please specify) |  |  |

**E About the person completing this form**

Family name

Given name/s

Contact phone number

Work email address

Are you reporting this incident on behalf of –

- The employer  A self employed person  A principal contractor  
 A major hazard facility  Other (Please specify your relationship to the workplace or incident)

**Privacy Statement:** The Department of Justice and Attorney-General respects your privacy and is committed to protecting personal information. The information provided on this form is for the purpose of advising Workplace Health and Safety Queensland and/or the Electrical Safety Office of a reportable incident under the *Workplace Health and Safety Regulation 2008*, *Electrical Safety Regulation 2002* and *Dangerous Goods Safety Management Regulation 2001*. This information will be managed within the requirements of the current state government privacy regime. The Department may be required to disclose your personal information to other regulatory agencies such as the Queensland Police Service, WorkCover, Q-Comp and other agencies in accordance with other law enforcement activities which may be conducted as part of an investigation. Further information on our privacy policy is available at [www.justice.qld.gov.au](http://www.justice.qld.gov.au).

## Appendix 6 Further information

### Workplace Health and Safety Queensland:

- [Website for information, legislation, codes of practice, forms etc.](#)

### Chainsaw use:

- AS 2726 - Chainsaw safety requirements
- AS 2727 - Chainsaws – Guide to safe working practices

### Pressure vessels:

- AS 3788 - Pressure equipment – In service inspection
- AS 3878 - Pressure equipment – Operation and maintenance
- AS 1210 - Pressure Vessels

### Laser Safety:

- AS/NZS 2211 – Laser safety

### Noise:

- [Noise code of practice 2004](#)

### Hazardous substances:

- [Hazardous Substances Code of Practice 2003](#)

### Confined spaces:

- [A guide to working safely in confined spaces](#)

### Plant:

- [Plant code of practice 2005](#)
- [Guide to safeguarding common machinery and plant](#)
- AS 1473-1991 – Guarding and safe use of woodworking machinery
- AS 1473.1-2000 – Woodprocessing machinery - Primary timber milling machinery
- AS 1473.2-2001 – Woodprocessing machinery - Safety - Finishing machinery - Common requirements
- AS 1473.3-2001 – Wood processing machinery - Safety - Finishing machinery - Circular sawing machines
- AS 1473.4-2001 – Wood processing machinery - Safety - Finishing machinery - Bandsawing machines
- AS 1473.5-2001 – Wood processing machinery - Safety - Finishing machinery - Moulding machines and routers with rotating tool
- AS 1473.6-2005 – Wood processing machinery - Safety - Finishing machinery - Surface planing and thicknessing machines
- AS 1473.7-2005 – Wood processing machinery - Safety - Finishing machinery - Tenoning, profiling and edge-banding machines
- AS 1473.8-2007 – Wood processing machinery - Safety - Finishing machinery - Milling tools and circular saw blades

### **Manual tasks:**

- [An Employers Guide to the Manual Tasks Code of Practice](#)
- [Participative Ergonomics for Manual Tasks \(PERforM\) Handbook](#)
- [Strains and Sprains Prevention Handbook](#)
- [Manual Handling Solutions in the Sawmilling Industry](#) - Worksafe Victoria (2005).

### **First aid**

- [First aid code of practice 2004](#)

### **Fire safety**

- [Fire and Rescue Service Act 1990](#)
- [Building Fire Safety Regulation 2008:](#)
- [Fire Safety Management Tool for Owner/ Occupiers](#)
- [Advisory Notes](#)
- [Templates: Fire and evacuation plan; Evacuation signs; Training records; and Fire safety installation checklist](#)

### **Risk management**

- [Risk Management Code of Practice 2007](#)
- [Hazpak – A guide to basic risk management](#) (NSW)

### **Other Standards Australia publications include:**

- AS 4024.1 - Safeguarding of Machinery Part 1 General Principles
- AS 1657 - Fixed platforms, walkways, stairways and ladders - Design, Construction and Installation
- AS 3000 - Electrical Installations - Buildings, structures and premises (also known as SAA Wiring Rules)
- AS 3760 - In-Service Safety - Inspection and testing of electrical equipment
- AS 1270 - Acoustics - Hearing protectors
- AS 1336 - Recommended protection for eye protection in the industrial environment.
- AS/NZS1337 - Eye protectors for Industrial Applications
- AS/NZS1715 - Selection, use and maintenance of respiratory protective devices
- AS/NZS1716 - Respiratory protective devices
- AS 1800 - Selection, care and use of industrial safety helmets
- AS 1801 - Industrial Safety Helmets
- AS 2865 - Safe working in a confined space
- AS 1680.1 - Interior Lighting - General Principles and Recommendations
- AS 1680.2 - Interior Lighting - Recommendations for specific tasks and interiors
- AS/NZS 2269 - Plywood - Structural
- AS 1366 Eye Protection
- AS 4343 Boiler operation