

Sawmilling industry hazard inspection checklist

This document provides guidance on safety hazards and issues, but it is not exhaustive or relevant to every workplace. Risk assessments should be conducted so that risks are found and can be managed. Licenses and registrations should be maintained.

Workplace name: _____

Site address: _____ Postcode: _____

Location: _____

Person/s conducting the assessment: _____

Legislation: [Work Health and Safety Act 2011](#) (WHS Act) and [Work Health and Safety Regulation 2011](#) (WHS Regulation)
[Electrical Safety Act 2002](#) (ES Act) and [Electrical Safety Regulation 2013](#) (ES Regulation)

1.0	Workplace layout, security, access and egress (WHS Regulation section 40)	Yes	No	N/A
	Guidance: Managing the Work Environment and Facilities Code of Practice 2011			
1.1	Does the layout of the workplace allow all people to enter and exit the workplace safely? This includes workers, visitors, members of the public, retail and delivery personnel.			
1.2	Does the layout of the workplace allow all people to move within it safely?			
1.3	Are slip, trip and fall hazards identified and rectified?			
1.4	Does lighting enable each worker to carry out work safely, move around safely and safely evacuate in an emergency?			
1.5	Are measures in place to prevent unauthorised access or operation to the following, 24 hours a day: <ul style="list-style-type: none"> restricted areas e.g. kilns, burners, buildings unattended plant e.g. mobile plant, saw benches, chippers etc. tools and equipment? 			
2.0	Facilities and housekeeping (WHS Regulation section 41)	Yes	No	N/A
	Guidance: Managing the Work Environment and Facilities Code of Practice 2011			
2.1	Is there an adequate number of toilets and hand washing facilities?			
2.2	Is drinking water available and accessible?			
2.3	Are lunch facilities provided?			
2.4	Are showers provided where necessary?			
2.5	Are facilities cleaned on a regular basis, at least daily?			
2.6	Are bins located at suitable points and emptied regularly?			
2.7	Are oily rags and combustible refuse kept in covered metal containers?			
2.8	Are spill management procedures in place and are there suitable cleaning equipment/materials provided?			
2.9	Are work areas cleaned following use?			



3.0	First aid (WHS Regulation section 42)	Yes	No	N/A
	Guidance: First Aid in the Workplace Code of Practice 2014			
3.1	Does the workplace have first aid facilities?			
3.2	Are they appropriate for the nature of the incidents likely to be incurred at the workplace?			
3.3	Are the first aid supplies current and in a well-maintained state?			
3.4	Are the locations of first aid kits clearly identified?			
3.5	Are there first aid officers on site?			
3.6	Are their certificates/qualifications current?			
3.7	Are records kept of any first aid treatment given by the first aid officer and reported to managers?			
4.0	Emergency plans (WHS Regulation section 43)	Yes	No	N/A
	Guidance: Managing the Work Environment and Facilities Code of Practice 2011			
	Template: Emergency Plans fact sheet			
4.1	Is there an emergency policy which includes an emergency plan, covering relevant emergency situations, with clear emergency procedures?			
4.2	Is the policy accessible by all workers?			
4.3	Are workers, managers and supervisors provided with information, training and instruction in the procedures?			
4.4	Are emergency contact details relevant to the types of possible threats displayed at the workplace in easily accessible locations? E.g. fire, police, poison information centre etc.			
4.5	Does your emergency policy include a documented site plan that illustrates the location of fire protection equipment, emergency exits and assembly points?			
4.6	Is your site plan displayed in key locations throughout the workplace?			
4.7	Does the workplace have emergency equipment to deal with the types of emergencies that may arise?			
4.8	Is the fire protection equipment suitable for the types of risks at the workplace?			
4.9	Is firefighting equipment easily accessible in an emergency?			
4.10	Are emergency exits clearly marked and free from obstruction?			
4.11	Are workers trained to use emergency equipment?			
4.12	Have you considered neighbouring businesses and how you will let them know about an emergency situation should one arise?			
4.13	Have you considered the risks from neighbouring businesses? E.g. fire from neighbouring land.			
4.14	Are emergency practice runs regularly undertaken to assess the effectiveness of the emergency plan? E.g. evacuation drills.			
5.0	Remote and isolated work (WHS Regulation section 48)	Yes	No	N/A
	Guidance: Managing the Work Environment and Facilities Code of Practice 2011			
5.1	Is there a policy and procedure in place to ensure that mobile or remote workers have access to clean drinking water, toilets, dining facilities, hygienic storage of food and water, and emergency and first aid assistance?			
5.2	Can mobile or remote workers access emergency communications that are reliable in their location, such as a satellite or mobile phone?			
6.0	Traffic management (WHS Regulation part 3.1)	Yes	No	N/A
	Guidance: Traffic Management General guide ; Workplace Traffic Management Information sheet			
6.1	Is there a traffic management policy and procedures in place that manages: <ul style="list-style-type: none"> the desired flow of pedestrian and vehicle / forklift (shared zones) movements the expected frequency of interaction between vehicles and pedestrians roles and responsibilities of people in relation to traffic management how short term, mobile work or complex traffic situations will be managed 			
6.2	Does the policy include a sketch or illustration of the worksite? This should show the location of traffic routes, pedestrian walkways, barriers and signage, loading/unloading bays, carparks, maintenance bays, work areas and buildings.			

6.3	Is traffic management included in the following components of the work health and safety management system:			
	<ul style="list-style-type: none"> hazard identification hazard /risk management register site inspections/audits contractor management (e.g. codes of conduct and quality standards) procurement of new equipment (e.g. safety devices on mobile plant)? 			
6.4	Is information and instruction about safe traffic and pedestrian movement around the workplace provided at induction to workers and in advance to visitors, contractors and external delivery drivers?			
7.0	Stacking and storage (timber) (WHS Regulation part 3.1) Guidance: Forestry: Guide to managing risks of loading, transporting and unloading logs	Yes	No	N/A
7.1	Is there a policy and procedure detailing all risks and controls for stacking and storing logs and undressed and dressed timber, which includes safe methods of working in stacking and storage areas?			
7.2	Do the procedures include: <ul style="list-style-type: none"> public protection safe stacking of logs building stable sawn timber packs slinging and lifting of loads? 			
7.3	Is any pallet racking engineered designed, safe for use and conforms with manufacturers specifications?			
7.4	Have workers received information, training and instruction on stacking and storing logs and boards?			
8.0	By-product and waste management (WHS Regulation part 3.1)	Yes	No	N/A
8.1	Are there documented procedures and controls for by-product and waste management?			
8.2	Are all hazards associated with storage, management and disposal of by-products and waste been identified? Hazards may include: pollution, spontaneous combustion, collapse, engulfment, entrapment.			
8.3	Have all identified hazards associated with storage, management and disposal of by-products and waste been controlled?			
8.4	Are workers provided with information, training and instruction on the correct management and disposal methods of by-products and waste? E.g. saw dust, chip, fire wood, bark etc.			
9.0	Noise (WHS Regulation part 4.1) Guidance: Managing Noise and Preventing hearing loss at Work Code of Practice 2013	Yes	No	N/A
9.1	Has the level of hazardous noise from plant and machinery been measured and assessed?			
9.2	Have steps been taken to control the level of noise emitted from plant and equipment and other noisy areas?			
9.3	If personal hearing protective devices are required, are the provided devices suitable and worn by workers?			
9.4	Are areas where people may be exposed to hazardous noise sign-posted as hearing protector areas and the boundaries of these areas clearly defined?			
9.5	Have all workers received training, information and instruction in the proper use, fit, care and maintenance of personal hearing protectors?			
10.0	Hazardous manual tasks (WHS Regulation section 4.2) Guidance: Hazardous Manual Tasks Code of Practice 2011 Template: Hazardous manual tasks risk assessment worksheet	Yes	No	N/A
10.1	Have all hazardous manual tasks at the workplace been identified?			
10.2	Do control measures in place safeguard workers and all people from hazards associated with manual tasks?			
10.3	Have all workers received training for using controls which have been developed and are workers trained on the procedures for hazardous manual tasks controls?			
11.0	Hot work (WHS Regulation part 3.1, section 51 - 53) Guidance: Welding Processes Code of Practice 2013	Yes	No	N/A
11.1	Is there a hot work policy and procedure detailing the risks and controls for hot work hazards?			

11.2	Does the procedure include a hot work permit?																			
11.3	Have all workers received information, training and instruction for hot work prior to conducting hot work, including contractors required to complete hot work whilst on site?																			
12.0	Confined spaces (WHS Regulation part 4.3) Guidance: Confined Space Code of Practice 2011	Yes	No	N/A																
12.1	Is there policy and procedure detailing the risks and controls associated with working in a confined space, including entering, working in, on or near a confined space and inadvertent entry?																			
12.2	Does the procedure include a confined space entry permit?																			
12.3	Does the procedure also detail specific control measures including: <ul style="list-style-type: none"> • continuous communication and monitoring with the worker from outside the confined space by a standby person • signage • isolation of connected plant and services • controls to maintain safe atmosphere within the confined? 																			
12.4	Are there first aid and emergency rescue procedures to be followed in the event of an emergency in the confined space?																			
12.5	Have all confined spaces or areas where entrapment can occur been identified with signage, locked and access restricted? E.g. kilns, hoppers, silos.																			
12.6	Have all workers received information, training and instruction on confined spaces policy and procedures including contractors required to enter confined spaces?																			
13.0	Falls (WHS Regulation part 4.4) Guidance: Managing the risks of falls Code of Practice 2011	Yes	No	N/A																
13.1	Have all locations and tasks that could cause injury to workers due to falling been identified and controlled, including access to areas where work is to be carried out?																			
13.2	Do control measures in place safeguard workers and all people from hazards associated with locations and tasks where workers could fall?																			
13.3	Have all workers received information, training and instruction on controls which have been developed and procedures for preventing or minimising the risk of workers falling including any contractors?																			
14.0	Machinery and equipment (WHS Regulation part 3.1, section 203 and part 5.1 - 5.3) Guidance: Managing the risks of plant in the workplace code of practice 2013	Yes	No	N/A																
14.1	Have all hazards associated with the following plant and machinery that have the potential to cause harm to workers and other people been identified and controlled? (<i>Select items of plant used at this workplace.</i>) <table border="0" style="width: 100%; margin-top: 10px;"> <tr> <td style="width: 50%;">Chainsaws</td> <td style="width: 50%;">Conveyors</td> </tr> <tr> <td>Log debarker</td> <td>Planing and sizing machines</td> </tr> <tr> <td>Log carriages</td> <td>Kilns</td> </tr> <tr> <td>Saw benches</td> <td>Chippers</td> </tr> <tr> <td>Docking saws</td> <td>Stacking and strapping machines</td> </tr> <tr> <td>Round table or green chain</td> <td>Portable power tools</td> </tr> <tr> <td>Breakdown saws</td> <td>Other (please list): _____</td> </tr> <tr> <td>Multi rip saw/straight line edgers</td> <td></td> </tr> </table>	Chainsaws	Conveyors	Log debarker	Planing and sizing machines	Log carriages	Kilns	Saw benches	Chippers	Docking saws	Stacking and strapping machines	Round table or green chain	Portable power tools	Breakdown saws	Other (please list): _____	Multi rip saw/straight line edgers				
Chainsaws	Conveyors																			
Log debarker	Planing and sizing machines																			
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Saw benches	Chippers																			
Docking saws	Stacking and strapping machines																			
Round table or green chain	Portable power tools																			
Breakdown saws	Other (please list): _____																			
Multi rip saw/straight line edgers																				
14.2	Do control measures in place safeguard workers and all people from hazards associated with plant and machinery?																			

- 14.3 If guarding is used in the workplace does it meet the below requirements:
- is of solid construction and securely mounted
 - cannot be by-passed or disabled
 - cannot be removed without the use of a tool
 - is properly maintained
 - allows for servicing, maintenance and repair if required
 - if guarding is removed, the plant cannot be restarted unless the guard is replaced
 - does not create a risk in itself (i.e. obstruct operator visibility)?
- 14.4 Are operating procedures available and easily accessible to those who use the plant and equipment?
- 14.5 Have workers been provided with information, training and instruction about operation procedures and checks for the machine and equipment they are operating?
- 14.6 Are any emergency instructions and or signage relating to an item of plant clearly displayed on or near it?
- 14.7 Are there isolation points on machinery and equipment to lockout controls, energy sources and other hazards when maintenance and cleaning tasks are being conducted?
- 14.8 If emergency stops are fitted to machinery and equipment does it meet the following requirements:
- the stop control is prominent, clearly and durably marked and immediately accessible to each operator of the plant
 - any handle, bar or push button associated with the stop control are coloured red
 - the stop control cannot be adversely affected by electrical or electronic circuit malfunction
 - in addition, where plant is designed to be operated or attended by more than one person and more than one control is fitted, the multiple controls must be of the 'stop and lock-off' type so that the plant cannot be restarted after a stop control has been used unless each activated stop control is reset?
- 14.9 Are emergency controls tested and is this recorded?
- 14.10 Are all operators controls clearly identified for functionality and within the operators reach?
- 14.11 Does the working area allow workers to safely carry out work?
- 14.12 Has design and/or item registration been undertaken for the required items of plant? E.g. pressure vessels, boilers, mobile cranes with rated capacity greater than 10 tonne etc.
- 14.13 Are records of plant design and/or item registration kept and available?

15.0 Mobile plant (WHS Regulation part 3.1, section 214 - 215, part 13.1 division 4 and schedule 3) **Yes No N/A**
Guidance: [Managing the risks of plant in the workplace code of practice 2013](#)

- 15.1 Have all hazards to workers and other people been identified and controlled? *(Select items of plant used at the workplace.)*
- forklifts (driven and pedestrian operated)
- loaders
- bobcats
- cranes
- tip trucks
- cherry pickers
- tractors
- other *(please specify)*: _____
- 15.2 Do control measures in place safeguard workers and all people from hazards associated with mobile plant?

15.3	If guarding is used in the workplace does it meet the below requirements:			
	<ul style="list-style-type: none"> is of solid construction and securely mounted cannot be by-passed or disabled cannot be removed without the use of a tool is properly maintained allows for servicing, maintenance and repair if required if guarding is removed, the plant cannot be restarted unless the guard is replaced does not create a risk in itself (i.e. obstruct operator visibility)? 			
15.4	Are all operators controls clearly identified for functionality and within the operators reach?			
15.5	Have workers been provided with information, training and instruction about operation procedures and checks for the mobile plant they are operating?			
15.6	Do workers who carry out high risk work, like operating a forklift, hold a high risk work licence?			
16.0	Electrical equipment (WHS Regulation part 3.1, ES Regulation part 6, division 6) Guidance: Electrical safety code of practice 2013 – Managing electrical risks in the workplace	Yes	No	N/A
16.1	Are electrical items, power tools, leads and other electrical machinery tested and tagged?			
16.2	Are the test tags current?			
16.3	Is there a record of the regular testing of RCDs, circuit breakers and electrical safety switches?			
16.4	Are electrical switchboards identified with signage indicating the hazards associated with contact and entry?			
16.5	Are they all locked and with restricted access?			
16.6	Is there an inspection process to check and remove dust that creates a fire hazard when arcing occurs around electrical supply systems?			
16.7	Is there a register for all electrical equipment?			
16.8	Are maintenance and service requirements on electrical tools and equipment carried out?			
16.9	Are processes in place to prevent employees from removing the likes of handles and guards from power tools?			
16.10	Have visual observations and inspections been carried out to verify this?			
17.0	Inspection and maintenance (WHS Regulation section 237) Guidance: Managing the risks of plant in the workplace code of practice 2013	Yes	No	N/A
17.1	Is plant regularly maintained, inspected and tested in accordance with manufacturer's specifications by a competent person? E.g. fixed, mobile, electrical, overhead cranes, slings and chains etc.			
17.2	Is there policy and procedure for isolating plant before maintenance or cleaning work is carried out?			
17.3	Are records for maintenance, inspection, service and maintenance of all plant kept and available? E.g. fixed, mobile, electrical, overhead cranes, slings and chains			
17.4	Are there maintenance and repair procedures and do they include or refer to additional requirements to ensure safety of maintenance personnel.			
17.5	Is there a documented process for reporting faults, requests for repairs etc.?			
18.0	Hazardous chemicals (WHS Regulation part 7.1) Guidance: Managing Risks of Hazardous Chemicals in the Workplace Code of Practice 2013	Yes	No	N/A
18.1	Have all hazardous chemicals used in the workplace been identified and their details recorded in a hazardous chemicals register?			
18.2	Are there current (within five years of issue date) safety data sheets for each hazardous chemical kept at the workplace?			
18.3	Are all containers used for hazardous chemicals labelled in accordance with the globally harmonised system (GHS)?			
18.4	Are all hazardous chemicals used, handled and stored in accordance with the requirements of the safety data sheet for each chemical?			
18.5	Are placards used to communicate to workers, visitors and emergency services the presence of hazardous chemicals in quantities that exceed a placard quantity?			

18.6	If hazardous chemicals exceed the manifest quantity in column 5 of schedule 11 of the WHS Regulation, has WHSQ and Queensland Fire and Emergency Services been notified and has a copy of the manifest been placed in a red hazmat box inside the site near the main entry?			
18.7	Are gas bottles stored and secured appropriately? E.g. away from doorways and entrances.			
18.8	Workers have been provided with training on the handling, use and storage of hazardous chemicals kept at the workplace.			
19.0	Wood dust (WHS Regulation section 49 - 50) Guidance: Managing the Work Environment and Facilities Code of Practice 2011	Yes	No	N/A
19.1	Have risks from wood dust including worker exposure, fire and explosion been identified?			
19.2	Has air monitoring been carried out if the level of exposure to workers is uncertain?			
19.3	Are a combination of controls used to prevent exposure to airborne wood dust?			
19.4	Have workers received training on risks associated with wood dust and how to use controls to minimise risk?			
19.5	Are 'M' class vacuums with a high efficiency particulate air (HEPA) filter used to clean surfaces and clothing instead of brooms or compressed air?			
20.0	Asbestos (WHS Regulation chapter 8) Guidance: How to Manage and Control Asbestos in the Workplace Code of Practice 2011	Yes	No	N/A
20.1	Has an asbestos register been prepared for the workplace if it was built before 1 January 1990?			
20.2	Has an asbestos management plan been developed where asbestos has been identified at a workplace?			
20.3	Is a copy of the asbestos register and management plan available at the workplace?			
20.4	Is the presence and location of asbestos identified by a sign or label?			

Action plan template

Item no.	What is the issue?	How will it be fixed?	Who is responsible?	Who is involved?	When will it be done by?	Completion date

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Sawmilling industry

Health and safety guide 2017

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1. Introduction

This Sawmilling industry health and safety guide 2017 was produced in collaboration with 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.

Persons conducting a business or undertaking or self-employed persons, persons in control and others with obligations under the *Work Health and Safety Act 2011* (the Act) should ensure 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 risks
- a list of reference materials.

This guide does not address all potential hazards and risks, but does address the most common ones. The control measures provided offer a range of options that may be adopted. Where this guide does not address a particular risk, the risk 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 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	Audit checklists
Appendix 2	Hazard identification register
Appendix 3	Risk calculator
Appendix 4	Job safety analysis form
Appendix 5	Incident notification blank form (Form 3)
Appendix 6	Sources of further information

2. Legal duties

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

2.1 Duty holders

Duty holders are persons conducting a business or undertaking (PCBU) who are:

- persons with management or control of a workplace
- persons with management or control of fixtures, fittings or plant at a workplace
- designers of plant, substances or structures
- manufacturers of plant, substances or structures
- importers of plant, substances or structures
- suppliers of plant, substances or structures
- persons who install, construct or commission plant or structures.

Duty holders may have obligations under the Act and may be subject to more than one work health and safety duty.

2.2 Acts, regulations and codes of practice

Legislation that is relevant to the sawmilling industry includes:

- [Work Health and Safety Act 2011](#)
- [Work Health and Safety Regulation 2011](#)
- [Electrical Safety Act 2002](#)
- [Electrical Safety Regulation 2013](#)
- [Building Fire Safety Regulation 2008](#)

Under the Act, there are three types of instruments to help you meet your work health and safety duties – 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 duties are met.

Note: There may be additional risks at your workplace that have not been specifically addressed in this sawmilling industry health and safety guide, including its supplementary documents. You are still required under the Act to identify and assess these risks and ensure control measures are implemented and reviewed to eliminate or minimise exposure to these risks.

This guide should be read in conjunction with the *Work Health and Safety Act 2011*, *Work Health and Safety Regulation 2011*, *Electrical Safety Act 2002* and relevant codes of practice. Where applicable, specific codes of practice are referred to in the text.

A list of codes of practice relevant to sawmilling is provided in Chapter 3. These codes give detailed guidance on particular hazards encountered in sawmills. You are strongly advised to obtain the documents that are available from the Work Health and Safety Queensland (WHSQ) website, worksafe.qld.gov.au.

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 or they can be viewed in larger public libraries.

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 WHSQ website is a useful reference point for all information regarding workplace health and safety and can be accessed at worksafe.qld.gov.au.

3. Risk management

The Act requires PCBUs to manage all work health and safety risks, so that the health and safety of workers and other people are not affected by an organisation's conduct.

Hazard: A hazard is a situation that has the potential to harm a person.

Risk: A risk is the possibility that the harm (i.e. death, an injury or an illness) might occur when exposed to a hazard.

For example, a worker is using a petrol-operated pump in a confined space, such as a well. In this situation, carbon monoxide is a hazard. The associated risk is the likelihood that the worker might suffer carbon monoxide poisoning while working in the confined space because of the operating pump.

The four step process for managing risks

Step one - Identify hazards

Some hazards may be more obvious than others because they are common and well known in a particular industry. Others may be more difficult to identify. It is important to work closely with workers and look at every task in the workplace to help identify all potential hazards.

Workplace records on incidents, near misses, health monitoring and the results of inspections can also help identify hazards. If someone has been injured during a particular task, then a hazard exists that could hurt someone else. Workplace incidents need to be investigated to identify any hazards involved and to control the corresponding risks.

Step two - Assess the risk

A risk assessment can help determine:

- the severity of a risk
- whether any existing control measures are effective
- what actions should be taken to control the risk
- how urgently those actions should be completed.

A risk assessment is mandatory for certain high risk activities such as entry into confined spaces, diving work, live electrical work and high risk construction work.

In other situations, some hazards and their associated risks are well known and have well established and accepted control measures. In these situations, the second step of formally assessing the risk is not required. If after identifying the hazard, you already know the risk and how to control it effectively, you may simply implement the control.

However, a risk assessment should be done when:

- there is uncertainty about how the hazard may result in an injury or illness
- the work activity involves a number of different hazards and there is a lack of understanding about how the hazards may interact with each other to produce new or greater risks
- understanding about how the hazards may interact with each other to produce new or greater risks there are changes at the workplace that may impact on the effectiveness of control measure.

Step three - Control the risks

This is the most important step in managing risks – eliminating the identified hazard so far as is reasonably practicable, or if that is not possible, minimising risks as far as reasonably practicable.

The ways of controlling risks can be ranked from the highest level of protection and reliability to the lowest. This is called the hierarchy of control.

The WHS legislation requires the PCBU to work through the hierarchy of controls when managing risks. This means the PCBU must always aim first to eliminate the hazard. This is the most effective control.

If elimination is not reasonably practicable, the PCBU must minimise the risk so far as is reasonably practicable by doing one or more of the following:

- Substituting (wholly or partly) the hazard creating the risk with something that creates a lesser risk.
- Isolating the hazard from any person exposed to it.
- Implementing engineering controls.

If a risk remains, it must be further minimised, so far as is reasonably practicable, by implementing administrative controls or through the use of personal protective equipment (PPE).

Administrative controls are work methods or procedures that are designed to minimise exposure to a hazard (e.g. the use of signs to warn people of a hazard). Examples of PPE include ear muffs, respirators, face masks and protective eyewear. It is important to remember that PPE limits exposure to the harmful effects of a hazard, but only if it is worn and used correctly.

Administrative controls and PPE should only be used:

- when there is no other practical control measure available (as a last resort)
- as an interim measure until a more effective way of controlling the risk can be used
- to supplement higher level control measures (as a back-up).

Step four - Reviewing risk controls

Controlling health and safety risks is an ongoing process that needs to take into account any changes that occur at the workplace. This is why procedures and risk controls must be reviewed regularly to ensure they are still effective.

The WHS Regulation requires a review of control measures in certain situations. A review, and if necessary, a revision is required:

- when the control measure does not control the risk it was implemented to control
- before a change at the workplace that is likely to give rise to a new or different health and safety risk, which the control measure may not effectively control
- if a new hazard or risk is identified
- if the results of consultation indicate that a review is necessary
- if a health and safety representative requests a review and they reasonably believe that a circumstance referred to above affects or may affect the health and safety of a member of the work group they represent.

If problems are found, go back through the risk management steps, review the relevant information and make further decisions about risk control.

Control measures for serious risks should be reviewed more frequently.

Note: The information provided by this page should be read together with the *How to manage work health and safety risks code of practice 2011*. This code provides detailed information and practical examples.

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

Table 1. Some codes of practice associated with hazards in sawmills

Noise	Managing Noise and Preventing Hearing Loss at Work Code of Practice 2013
Hazardous substances	Managing Risks of Hazardous Chemicals Code of Practice 2013
Confined spaces	Confined spaces Code of Practice 2011
Plant	Managing Risks of Plant in the Workplace Code of Practice 2013 Guide to machinery and equipment safety
Manual tasks	Hazardous Manual Tasks Code of Practice 2011 Manual Handling Solutions in the Sawmilling Industry (VIC)
First aid	First Aid in the Workplace Code of Practice 2014

The below hazards may 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	Collision with pedestrians and other plant, build-up of toxic exhaust fumes, dust
Noise	Hazardous noise levels associated with operating machinery
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 chemicals	Timber treatment chemicals, industrial gases and LP Gas, flammable solvents and fuels, asbestos.
Electricity	Electrical plant, switchboards, overhead cables and lights, dust build up.
Psychosocial hazards	Effects of work-related stress, bullying, violence and work-related fatigue.

Consider the following groups of individuals who may be present at sawmills.

- 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 at sawmills, who could be hurt by sawmilling and associated activities.

For more information on how to do a risk assessment refer to section 3 of the [How to Manage Work Health and Safety Risks Code of Practice 2011](#).

Hierarchy of control measures

The hierarchy of controls is outlined in section 36 of the [Work Health and Safety Regulation 2011](#)

- (1) This section applies if it is not reasonably practicable for a duty holder to eliminate risks to health and safety.
- (2) A duty holder, in minimising risks to health and safety must implement risk control measures under this section.
- (3) The duty holder must minimise risks, so far as reasonably practicable, by doing one or more of the following-
 - (a) Substituting (wholly or partly) the hazard giving rise to a lesser risk;
 - (b) Isolating the hazard from any person exposed to it;
 - (c) Implementing engineering controls
- (4) If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by implementing administrative controls.
- (5) If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by ensuring the provision and use of suitable personal protective equipment.

Note: A combination of the controls set out in this section may be used to minimise a risk, so far as is reasonably practicable, if a single control is not sufficient for the purpose.

For more information on deciding on control measures refer to section 4 [How to Manage Work Health and Safety Risks Code of Practice 2011](#).

4. Specific components

4.1 Log handling

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 injuries.

Controls for log handling

1. Loading machines are to have roll over protection structure (ROPS) and falling object protection structure (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. Workers should not be unloading at night without yard lights. There must be sufficient lighting 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

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 PPE 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 **kickback**, **pushback** 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.
18. Do not refuel a chainsaw when the engine remains hot as it may ignite the fuel. Allow a cool-down period between operating the chainsaw and refuelling.

4.3 Log debarking

Hazards associated with log debarking/merchandising systems include:

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

Controls for log debarkers/merchandisers

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 the 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 areas 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 the operator is in communication with the loader operator and sawmill at all times.
11. The following PPE should be worn: ear protection, eye/face protection, high visibility clothing and steel cap boots.

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 include:

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

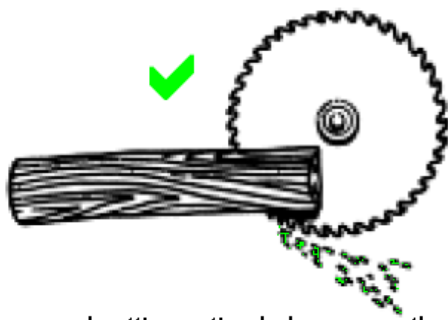
Energy/electrical hazards associated with log carriages and breakdown saws include:

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

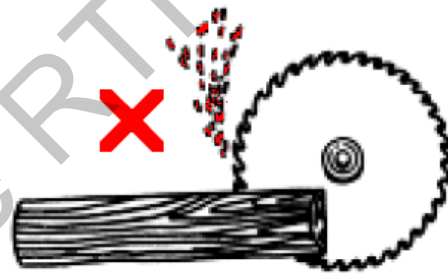
Controls for log carriages and breakdown saws

1. The area around the log carriage and breakdown 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. Flitches 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 seven point five degrees on each side of the centreline of 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 flitches.
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 each flitch needs to be manually handled from a vertical to a horizontal alignment for cutting.
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 no persons are within the restricted area prior to engaging the carriage and setting it in motion.

11. The saw operator's 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 incidents 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. 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, include:

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

Energy/electrical hazards associated with saw benches include:

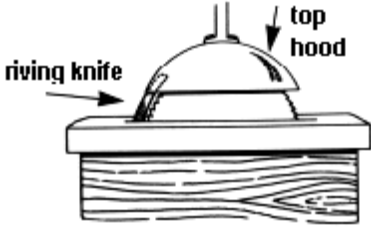
- contact with live electrical or mechanical installation
- failure of energy supply resulting in loss of control systems
- stored energy (in hydraulic or pneumatic systems), kinetic energy and potential energy
- noise
- vibration.

Controls for saw benches

Saw blades are the obvious hazard on a saw bench but there is also a risk of injury from moving parts such as pulleys, drives, chains, and hobs. Guarding of the saw blade and other mechanical parts should 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:

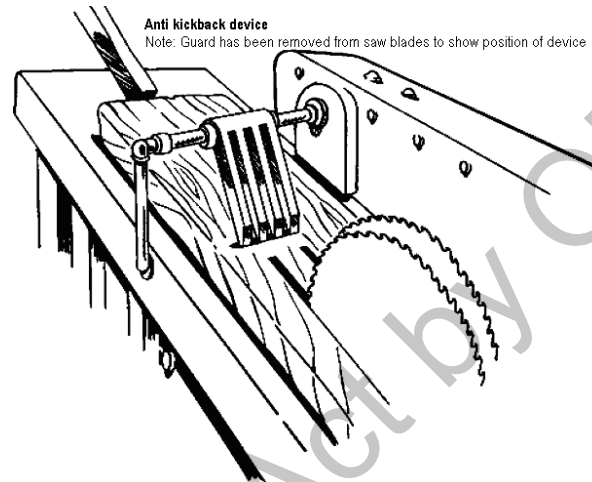
1. The saw blade should be guarded above the bench by using an easily adjustable hood (top guard) and a correctly adjusted riving knife (back guard).
2. The lower half of the saw blade should be guarded to prevent inadvertent contact.
3. The hood should be designed to cover the saw blade and riving knife 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 (AS1473.1 (5.6.1.))
5. No saw should be left unattended while rotating, either while it is 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 when the saw is shut down.
7. A riving knife should 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 (AS1473.1 Wood-processing machinery—safety Part 1: Primary timber milling machinery (Appendix C – Riving knives and roller splitters)).
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. Appendix C.
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:

Sawblade diameter mm	Minimum riving knife height (H)	Maximum riving knife clearance (A)	Riving knife width at base (W1)	Riving knife profile
<600	13 mm from top of blade	13 mm	—	
>600 <1070	0.85 blade radius	Saw diameter/50	max. dia./9	
>1070	0.75 blade radius	Saw diameter/50	max. dia./6	

11. Saw blade drives, pulleys and other nip points should be guarded.
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 worker.
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. The hazard zone around circular saws is the area where flitches 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 seven point five degrees 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.

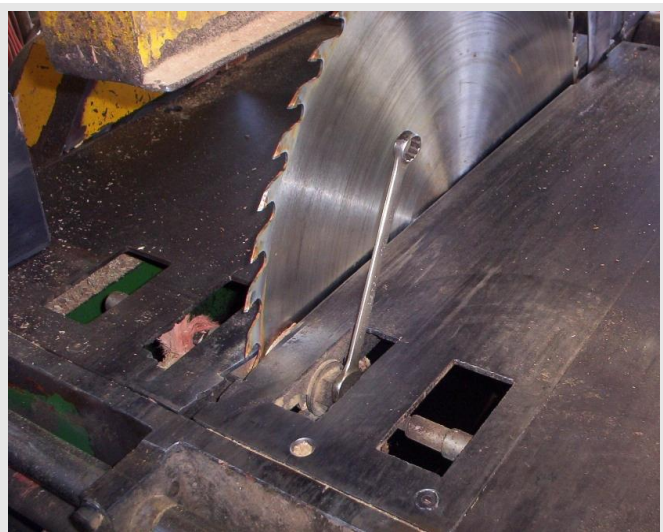


Standing a saw and packing adjustment

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 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 teeth can be seen. The guard should flip down from a permanent attachment to the hood guard.
3. The below 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 pneumatic systems), kinetic energy and potential energy.
- Noise and vibration.

Controls for docking saws

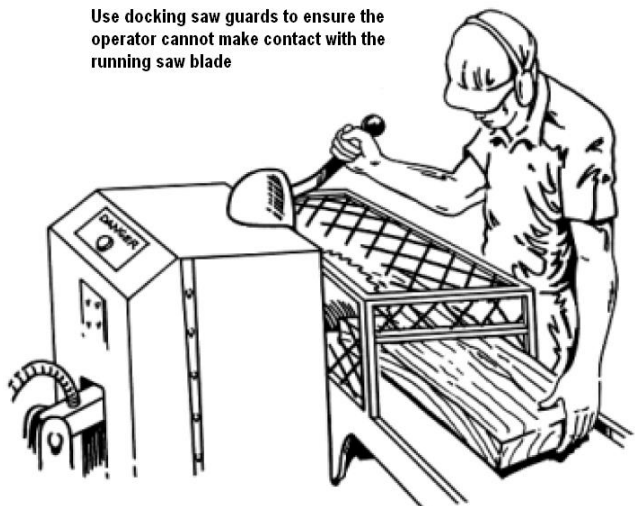
1. The docking saw shall be operated and maintained under conditions to ensure that the health and safety of persons is not put at risk.
2. Only operators who are trained or are under supervised training shall operate docking saws.
3. Only trained operators and authorised personnel shall be permitted 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. The counter weight, spring, pneumatic 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.
7. The gap between the guide fences shall be kept to a minimum (three millimetre to four millimetre wider than the kerf of the saw blade).
8. The correct diameter docking saw blade must be used at all times and the saw tooth pattern must be suitable for the application.
9. 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 and lock the saw out.
10. All docking saws should be operated by the activation of two buttons spaced apart to prevent operation by one hand unless sufficient guarding is in place.
11. The saw should be guarded to prevent human contact with the blade drives from any direction. For instance, side guards at least 300 millimetre from blade for two-handed operation and at least 600mm from blade for one handed or foot operation. 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.
12. Operating buttons should be shrouded to ensure that they are not inadvertently engaged.
13. 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.

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



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.

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 a 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 100 millimetre 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:

- the hand control is released
- the hand control is returned to the neutral position
- loss of hydraulic/pneumatic pressure.

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. 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 300 millimetre 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

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

4.8 Planning and sizing machines

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

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

Energy/electrical hazards associated with planning 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 pneumatic systems), kinetic energy and potential energy.
- Noise and vibration.
- Poor lighting.

Controls for treatment plants

1. Only operators who are trained or are under supervised training shall operate treatment plants.
2. Treatment plants use hazardous chemicals. Hazardous chemicals are required to have a safety data sheet (SDS) from the manufacturer or importer of the chemical and must be made readily available at the treatment plant. SDS contains critical health and safety information about the chemical hazards. The advice contained in the SDS must be followed and used when conducting a risk assessment of an activity involving a hazardous chemical.
3. Operators should be familiar with the SDS for the hazardous chemicals used, stored and handled.
4. Operators must be trained in the safe storage, handling and use of the hazardous chemicals involved in the treatment processes.
5. Emergency procedures for the hazardous chemicals being used should be displayed.
6. Where required by the SDS, emergency eyewash and emergency shower facilities should be located at the treatment plant.
7. Food and drink should not be stored or consumed in the treatment plant to eliminate the risk of being exposed to toxic substances (e.g. timber preservative chemicals).
8. Only trained operators and authorised personnel shall be permitted in the treatment plant work area. Appropriate personal protective equipment must be worn as advised by the SDS when handling timber preservative, treated product or waste material and may include:
 - a. eye protection
 - b. gloves/gauntlets
 - c. gum boots/impervious footwear
 - d. protective clothing/coveralls
 - e. respirator/dust mask
 - f. hearing protection where noise levels exceed 85 dB(A) over an eight-hour day or a peak of 140 dB(C).
9. Work area and drip pads must be kept in a tidy condition (e.g. dunnage picked up and drip pads hosed down).
10. All run-off from drip pads must be contained in sumps to be recycled.
11. The treatment area plus treatment and storage tanks must be contained in a bonded area.
12. Where the operator is not in continuous attendance, a safety shut-down system should be provided in case of system failure.
13. All safety devices, pressure valves, pumps and trolleys should be serviced and maintained at regular intervals.

14. See section on pressure vessels for details of specific maintenance requirements for pressure vessels, valves etc.
15. 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 [Work Health and Safety Regulation 2011](#).
16. 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.
- Electrocutation.
- 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 commence inside the kiln.
- Gases present a significant hazard and must be safely stored, handled and used. For example, industrial gases are stored under high pressure and LP Gas is highly flammable.
- Seek specialist advice on gas safety to minimise the associated risks that arise from gas leaks and having to respond to gas leaks.
- 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.

- Gas suppliers may provide further advice on the safe management of gas installations and equipment at the workplace.

4.11 Other fixed plant

Refer to the [How to Manage Work Health and Safety Risks Code of Practice 2011](#) for particular ways to manage the risks associated with plant and for further guidance on guarding.

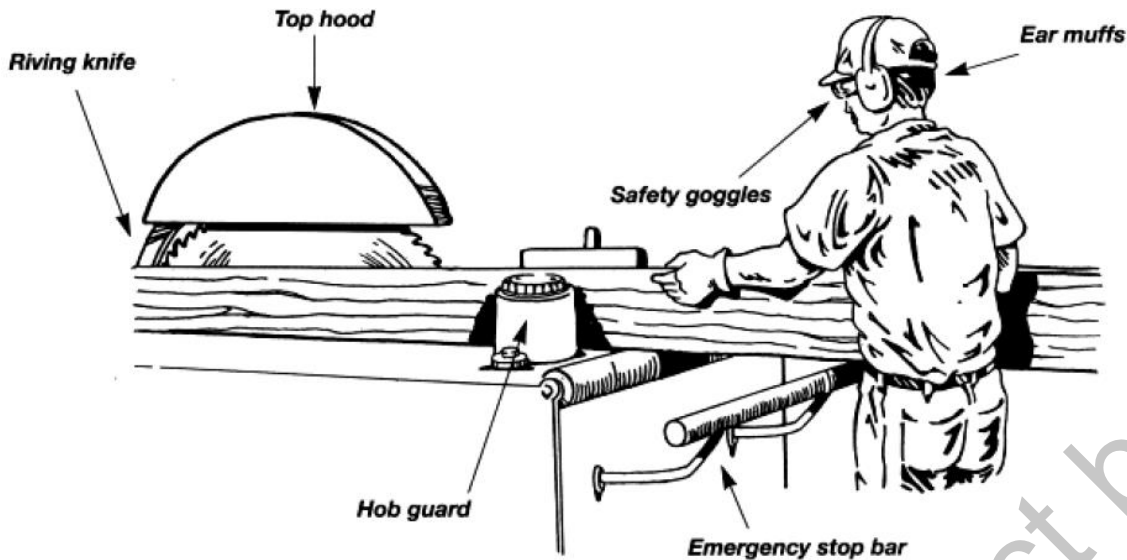
Plant and equipment hazards

- 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, pneumatic, 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 before carrying out maintenance and cleaning works.



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, pneumatic and hydraulic systems.



Where isolation procedures are implemented, for particular plant routine replacement or maintenance, standard work procedures could be developed and used as required. For more information on isolation and lock out procedures, refer to section 5.13 of this guide.

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 pneumatic systems), kinetic energy and potential energy
- noise
- vibration.

Controls for chippers

1. Ideally chippers should be located remote from the mill due to the noise and vibration they generate.
2. 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.
3. 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 or a peak of 140 dB(C).
4. Properly constructed acoustic enclosures with extended apertures and baffles on the in-feed and out-feed conveyors can reduce externally transmitted noise.
5. 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 start-up unexpectedly.
6. When handling chipper knives, it is necessary to ensure that the worker is protected from the cutting edge by gloves, aprons or other means.
7. A vibrating in-feed conveyor can be used to remove sawdust and settle timber.
8. Magnets or metal detectors should be considered as a means of preventing metal 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

- Mechanical hazards.
- Energy.
- Contact with moving parts.
- Impact with moving material.

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.

Energy

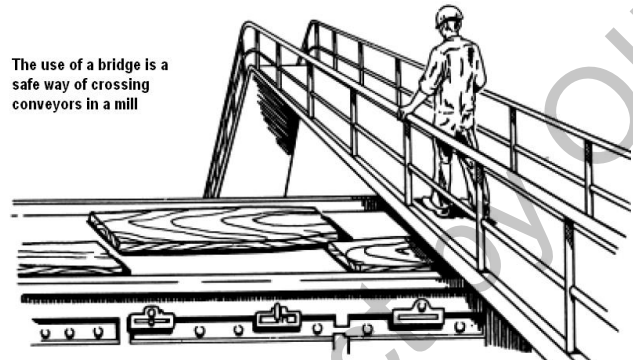
- Release of stored energy in hydraulic and pneumatic systems.
- Electricity.
- Failure of energy resulting in loss of control systems.

Contact with moving parts

- Belts, chains, rollers.

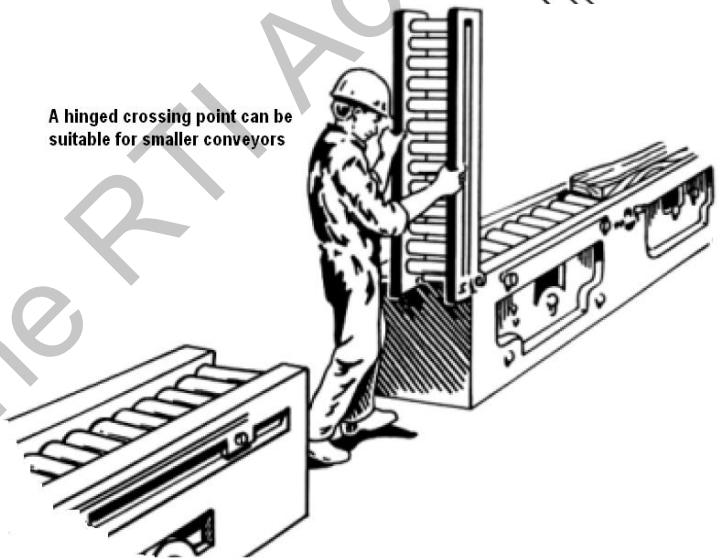
Impact with moving material

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



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 so that the conveyor automatically stops when the hinged section is opened. Such hinged sections should also be designed so 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 should be provided to stop the conveyor or conveyor system in the event of an emergency. Emergency stops should be easily identifiable and accessible. Consideration should be given to the number and location of emergency stops.
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.



4.14 Powered mobile plant (including loaders and cranes)

Reference should be made to the [How to Manage Work Health and Safety Risks Code of Practice 2011](#) which contains information and guidance in the section on powered mobile plant. Additionally, the [Electrical Safety Code of Practice 2010 – Working near overhead and underground electric lines](#).

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 at a sawmill include:

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

Hazards associated with powered mobile plant include:

- operator competency
- speed
- pedestrians
- uneven surface (overturning)
- collision
- overhead electric lines
- restricted vision
- flammable substance
- exhaust, fumes, noise and vibration.

Control measures for powered mobile plant

1. Most powered mobile plant used at sawmills will be subject to the risk of rollover and dislodged loads and therefore require protective structures (ROPS and/or FOPS) to be fitted.
2. All powered mobile plant with ROPS or FOPS should be fitted with seat belts that are worn by operators.
3. 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.
4. 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.
5. Ensure mobile plant is fitted with a visual beacon and with audible reversing alarms.
6. Ensure training and induction material includes the need to be aware of the risks associated with powered mobile plant.
7. Load lifting using powered mobile plant should always be within the limitations of the approved load for the plant.
9. Loads must never be lifted over the heads of persons or buildings.
10. Mobile powered plant may produce toxic exhaust fumes that can collect in low lying areas such as pits, tunnels, and drains, such plant must not operate in the vicinity or these areas if there are persons working in them.
11. 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.
12. All mobile plant must be maintained in a safe condition and records should be kept.
13. Ensure that no person or plant comes within an unsafe distance of an electric line. Refer to the [Electrical Safety Code of Practice 2010 - Working near overhead and underground electric lines](#).

Operator licensing

Operators of certain load shifting equipment, forklifts, cranes or hoists, as well as doggers, require a high risk work licence (HRWL).

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 must have a dogging license.

High risk work licences required at sawmills may include:

- **Forklift operation licences**
 - LF Forklift truck (other than an order-picking 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 (with a capacity of 10 metre tonnes or more).
 - CN No 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).

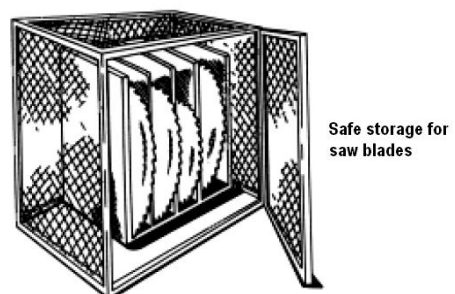
4.15 Blade handling

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.

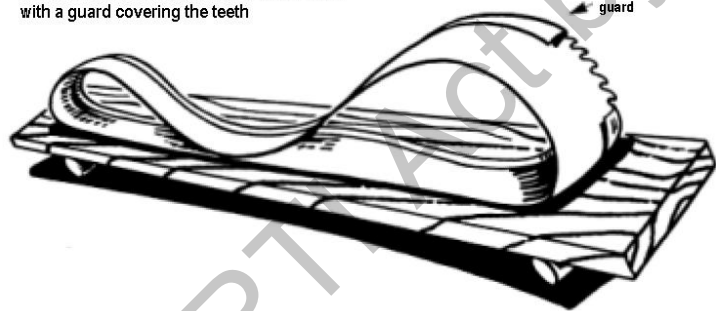
Control measures for handling blades

1. 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.
2. Restrict access to areas where large blades are stored.
3. Old or unused saw blades should not be left unprotected in the work area.
4. Bandsaw teeth must be covered during transportation and storage.
5. Use a container to transport smaller blades.
6. Circular saw blades should be covered at all times during transportation and storage. Consider the use of kevlar or leather covers.



7. 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.
8. A simple carrying tool can be made to ensure the edges of circular blades are angled away from legs during carrying (see illustration below).
9. Use the safest route when transporting large blades - avoid steps, stairs and rough floor surfaces.
10. Saw sharpening and maintenance should only be undertaken by trained persons.
11. Sharpening and grinding equipment must be properly guarded.
12. Dust removal unit should be fitted to grinding machines.
13. Ensure grinding wheels are the correct type for the task.
14. Automatic sharpening equipment must be located away from walkways and access routes, with appropriate warning signs and barriers to prevent inadvertent contact. Consider restricting access to the sharpening area.
15. Eye protection must be worn when in the vicinity of operating grinders/saw sharpeners.
16. Cut resistant gloves (made from materials such as kevlar or ballistic nylon) should be used when handling saw blades.

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



4.16 Portable power tools

Portable power tools present a range of hazards, including:

- electrocution
- moving parts
- flying objects being ejected
- trip hazards
- heat
- serving as an ignition source around flammable substances
- vibration
- dust and fumes
- noise.

Control measures for portable power tools

1. Equipment must have a current test tag.
2. Power tools must be used in accordance with manufacturer instructions.
3. Training and instruction must be given for safe operation.
4. Visually inspect the tool for damage before use.
5. Defective tools should be removed from service and tagged as unsafe.
6. Any required items of personal protective equipment must be worn (e.g. eye protection, hearing protection).
7. Persons not having to perform work in the area where the power tool is being operated should remain at a safe distance.
8. Power tools not in use should be stored safely.
9. 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

1. Outdoor working surfaces should be constructed to provide a relatively flat and safe working surface.
2. Ensure the workplace is maintained to avoid obstructions.
3. Yard layout should aim to segregate pedestrian routes from vehicle operating areas. These areas should be clearly marked or physically separated where possible.
4. Access to the timber yard should be restricted to authorised vehicles only.
5. Timber stacks should have packs stacked evenly, rows to be vertical, alleys to enable easy access at lowest operating height.
6. 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.
7. In general, single outdoor stacks should not be higher than three metres.
8. 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

1. Ensure they are constructed in compliance to Australian Standard AS1657.
2. Provide a good working surface.
3. Provide non slip surfaces.
4. Ensure areas are clear of all obstructions.
5. 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

1. 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.

2. 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 one tonne. The breaking strain of the selected strapping is 800 kilograms. Three straps would be needed to achieve a 2:1 ratio.
- Before using strapping consideration must be given to:
 - 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

1. The storage area should be as flat as possible.
2. Dunnage used is of a sufficient size and standard to support the weight of the stack.
3. Allow sufficient space between stacks to allow safe movement and operation of forklifts.
4. Generally single stacks should not exceed the height by more than four times the base width. Note that a one metre wide pack should not be more than four metres high - less if not square or stable.
5. Stack the packs squarely on top of each other.
6. 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
 - must have enclosed feed systems should be used to transport sawdust to the burner
 - must follow confined space procedures during cleaning and maintenance.
19. 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

- Wood dust or airborne particles 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. PPE (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 do not impose on workers or neighbouring properties.
- Woodchip and sawdust stockpiles must be maintained in a manner to eliminate the risk 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 available in the event of a fire.

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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 at sawmills. 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).

What is a hazardous manual task?

Not all manual tasks at sawmills will be hazardous manual tasks; however the Work Health and Safety Regulation 2011 (section 60) states that a PCBU must manage health and safety risks relating to a musculoskeletal disorder (MSD) that are associated with hazardous manual tasks.

Identifying hazardous manual task risks

1. Consult with your workers.
Ask workers about any discomfort, aches and pains they experience, and/or if they find any particular tasks problematic.
2. Review relevant data available at the workplace including hazard, injury and incident reports and trends. Common issues with hazardous manual tasks can be identified in trends.
3. Observe tasks being performed by workers to identify if there are any unmanaged risk factors present. Risk factors to watch out for include:
 - repetitive movements, sustained or awkward postures, repetitive or sustained forces. (As a general rule repetitive means a moved or force is performed for more than twice a minute, and sustained means a posture or force that is held for more than 30 seconds).
 - where a task is performed for longer than 30 minutes without a break, or more than two hours over a shift
 - high or sudden force. A worker may identify high force by describing the task as physically demanding, or where they need assistance to do the tasks. Jerky movements or unexpected movements are additional indicators of sudden force
 - vibration. Whole body vibration or hand arm vibration may increase the risk of MSDs. Further information on vibration is provided in section 5.4.

Assess the level of risk

A risk assessment will help you to:

- determine if one or more manual tasks are hazardous
- what risk factors are contributing to the risks
- help you determine the sources of the risks
- lead you to suitable controls to target the sources of these risks.

The main sources of hazardous manual tasks include the work area design and layout, the nature, size, weight or number of things handled, systems of work, and the work environment.

Controlling the risk

Controls for hazardous manual tasks, like any other risks, should be chosen by working through the hierarchy of controls from top to bottom. Higher order controls could include automation of work processes which require workers to conduct hazardous manual tasks, or redesign of a work process to eliminate or minimise double handling of goods. Lower order controls may include task rotation and using PPE and training and should be used to complement higher order controls.

When choosing appropriate controls, the sources of risk should be considered and targeted. Involve workers in the risk management processes, consult with and train workers in how to use

new controls or procedures, and ensure selected controls are monitored and reviewed to ensure no new hazards have been introduced.

Further information on manual tasks risks

- [Participative Ergonomics for Manual Tasks \(PEforM\) Handbook - Work Health and Safety Queensland \(2013\)](#)
- [Manual Handling Solutions in the Sawmilling Industry](#) - Worksafe Victoria (2005).

5.2 Housekeeping, buildings and grounds

Hazards associated with ground surface condition

Uneven ground surfaces or where there are pot holes, drains, washouts or soft spots are hazards that can create a risk to health and safety. These can be particularly hazardous and lead to slips trips and falls and destabilise loads being carried by mobile plant such as trucks, trailers, forklifts, end-loaders and mobile cranes.

Control measures for ground surface conditions

1. Every effort should be made to ensure access points are stabilised. This can be achieved by using compacted road base material, drained to prevent pooling of water and ensuring embankments or wash-outs are barricaded and signposted to prevent access.
2. Ground surfaces should be kept free of sharp objects that have the potential to penetrate pneumatic tyres causing blow outs which effect stability.
3. Nuisance dust should be controlled by frequently wetting dusty surfaces or where possible by applying a permanent sealer on the ground surfaces.

Hazards associated with the condition of buildings

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

Control measures for the condition of buildings

1. Annual inspections should be performed by a person who has a good understanding of safe building requirements and the applicable standards.
2. Building maintenance and repairs should be 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 excessive noise is where 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 headaches, fatigue, tinnitus, hearing impairment and total hearing loss. The effects of excessive noise may not become apparent until later in life. Hearing damage from exposure to excessive noise cannot be reversed.

Hazards associated with excessive 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

Duty holders should refer to the [Managing Noise and Preventing Hearing Loss at Work Code of Practice 2011](#), which states ways to manage the risks from excessive noise. This code of practice outlines methods for assessing the risks and implementing noise control measures. Duty holders must either do what this code of practice says or adopt and follow a way that gives equal or better protection.

The risk management process for excessive noise should be conducted in consultation with the workers concerned, and in accordance with the hierarchy of controls, as outlined below:

- **Substitution:** Replace noisy machinery with equipment designed to be operated 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 move activities away from workers unnecessarily exposed to the hazard. This can be achieved by using sound absorbing barriers. Noisy elements not an integral part of the 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 hearing conservation program. Provide workers with education, training and information on noise. Provide regular audiometric testing for exposed workers. Compare their latest test results with previous results as part of your hearing conservation program.
- **Personal protective equipment:** Use hearing protection to minimise residual noise where other methods of control do not sufficiently reduce noise exposure levels.

5.4 Vibration

Hazards associated with vibration

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

Hand/arm vibration occurs where vibration transfers to the hands and up the arms. This can disrupt the circulation of blood and oxygen in the affected areas and damage 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 from the repetitive shock loads of some tools.

Hand/arm vibration occurs when a worker holds:

- air operated tools (chipping hammers, routers and torque wrenches)
- vibrating steering wheels on vehicles and vessels or vibrating handles and controls.

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

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

Control measures for whole body vibration

Where workers are exposed to whole body vibration for extended periods in their shift, consideration should be given to the following controls:

1. Isolate or dampen vibrating work areas and platforms.
2. Improve vehicle suspension and install suspension dampened operator seats.

3. Operate equipment at suggested speed.
4. Limit exposure to whole body vibration.
5. Provide breaks away from vibrating sources.
6. Vary the pattern of work to break up periods of continuous driving.
7. Provide training on seat adjustment for individual drivers.
8. Instruct drivers to operate vehicles at the manufacturer's suggested speed or introduce speed limits.
9. Plan and maintain work site routes using the smoothest terrain and instruct drivers to operate vehicles at low speeds when traversing uneven terrain.
10. Instruct drivers to operate vehicles so as to avoid hitting objects and pot holes.

Control measures for hand/arm vibration

When vibration from tools/equipment is transmitted to the operator's hand, consideration should be given to the following controls:

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 the purchase and operation of tools where vibration emitted is in the range of 4-300 Hz for tasks performed repeatedly.
3. Choose tools that have speed adjustments, internal damping, vibration-isolated handles, and/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, as necessary.
6. Maintain cutting edges and portable equipment on a regular basis.
7. Provide workers 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 the minimum grip required for proper safe tool operation
 - the links between smoking, hand/arm vibration, and white finger
 - identifying and reporting vibration-related symptoms (finger tingling or whitening) which may indicate health problems
 - the need to report early symptoms of vibration-related disease at the workplace.

5.5 Confined spaces

A confined space means a space that is large enough and so configured that a person can enter and perform assigned work, has limited or restricted means for entry or exit and is not designed for continuous occupancy. Most sawmills 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 chemicals (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 4.2 of the Work Health and Safety Regulation 2011, sets out specific 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 the [Confined Spaces Code of Practice 2011](#).

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 due to possible health effects from the added chemicals.

Hardwood, such as beech, oak, ash and mahogany, or native hardwoods such as eucalyptus are generally more of a problem irritant. The dust generated from these species 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 worn.

The average airborne concentration of wood dust (over a normal eight hour working day, for a five day working week) should not exceed one milligram per cubic metre (hardwood) and five milligram 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 metres per second 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 when mixed 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 being spread by mobile plant such as loaders and forklifts. 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 flammable and combustible substances
- smoke and fumes.

Hot work is significant hazard when undertaken on containers that have previously contained flammable liquids (e.g. petrol, ethanol, acetone) or combustible liquids (e.g. diesel and oils). Ensure that all residues including vapours are removed (cleaned and gas free) before conducting any hot work such as hot cutting, grinding or welding on such containers. Also ensure that hot work is not conducted in close proximity to areas where flammable and combustible liquids are present including workshop areas where paints, thinners, aerosols and gas cylinders may be present. Separate flammables from hot work activities by using an adequate distance or a physical barrier.

Control measures for hot work

1. Operating a hot work permit system detailing risks and controls for conducting hot work.
2. Locate firefighting equipment in close proximity and ensure the equipment is tested to ensure positive operation and sufficient supply.
3. Provide appropriate ventilation and personal protective equipment.
4. Clean hot work areas of sawdust and flammable substances.
5. Dampen the area in which hot work is to be undertaken.
6. Check the 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" should be carried out within one hour of the 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.

Hazards associated with working at height include:

- 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 include:

1. Edge protection.
2. Fall protection covers.
3. Travel restraint systems.
4. Fall arrest platforms.
5. Fall arrest harness systems.

Control measures for falling objects include:

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 more than 120 kilograms and be:

1. manufactured for industrial use
2. used only for the designed purpose
3. inspected annually
4. not more than six point one metres for a single ladder
5. not more than nine point two metres for an extension ladder used for electrical work or seven point five metres for other work
6. erected at an angle between 70 degrees and 80 degrees.

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 centimetres out for every one point two metres).
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 one metre 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.

9. For guidance see WHS Regulation 2011, subdivision 3, ladders and platforms supported by ladders and AS 1657 – 2013 fixed platforms, walkways, stairways and ladders – design, construction and installation.

5.9 Hazardous chemicals

Hazardous chemicals have specific regulatory requirements under chapter 7 (Hazardous chemicals) of the [Work Health and Safety Regulation 2011](#). The Regulation is supported by various codes of practice including [Managing Risks of Hazardous Chemicals in the Workplace COP 2013](#), [Labelling of Workplace Hazardous Chemicals Code of Practice 2011](#), and [Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice 2011](#).

Hazardous chemicals in sawmills

Hazardous chemicals have the potential to cause harm to persons, property, and the environment. They may be 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 chemicals 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 chemicals

Reference should be made to the [Work Health and Safety Regulation 2011](#) part 7.1 Hazardous chemicals for specific requirements to safely store, handle and use hazardous chemicals.

The primary source of information available is the SDS. These will help a workplace to gather the necessary information to safely manage risks from the hazardous chemical. The PCBU must obtain a copy of the SDS before the hazardous chemical is brought into and used at the workplace and ensure that persons who are involved in using, handling or storing the hazardous chemical have ready access to the SDS. Training and instruction must be provided to ensure workers understand the physical and health hazards, and the precautions for safe storage, handling and use of the hazardous chemical as provided in the SDS.

SDSs should be reviewed regularly to ensure they are current and are no more than 5 years old. Contact the hazardous chemical supplier to obtain a current SDS.

Clear labelling of hazardous chemical containers must be maintained, including decanted substances. Hazardous chemicals must always be readily identifiable. Specific labelling requirements for containers including those used for transferring or decanting is provided in the [Labelling of Workplace Hazardous Chemicals Code of Practice 2011](#).



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. Specialist advice may be necessary from a chemical supplier or waste contractor to safely manage and dispose of unknown substances.

Piping, ducting, vessels and ancillary equipment should be clearly marked in accordance with recognised standards to minimise exposure to persons (refer to section 5.15 for further information).

Other ways to reduce exposure to hazardous chemicals include:

1. removing a non-essential hazardous chemical (e.g. holding an excessive inventory)
2. using a less hazardous chemical or the same substance in a less hazardous form or process
3. separating a process that uses hazardous chemicals from people by distance or by barriers like separating the area for mixing and preparing chemicals with limited access
4. using machinery, equipment or processes that minimise workplace contamination by containing or removing hazardous chemical residues
5. 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
6. 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.

Chemicals classified as dangerous goods are required to be transported according to dangerous goods transport legislation.

5.10 Outdoor work

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 working outdoors

Risks associated with working outdoors in sawmills include:

- 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 work

1. Reschedule outdoor work programs, where possible, to be performed outside the hours of greatest sun intensity (10am to 2pm), or coldest parts of the day.
2. Rotate tasks to allow workers some time in shady cooler areas.
3. Make maximum use of natural shade from the trees, buildings and other structures.
4. Advise individuals at particular risk, and ensure all workers whose work involves direct exposure to sunlight make maximum use of personal protection against the hazards of solar ultraviolet rays.
5. Inform workers 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.
2. 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.

3. 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 loose fitting clothing is not worn near plant or machinery with moving parts.
4. For adequate head and face protection, hats with brims of 10 centimeters to 12 centimeters should provide enough shade, but will not stop solar rays reflecting up from water, corrugated iron and aluminum sheeting surfaces. Ultraviolet eye protection that complies with current Australian Standards can be used.
5. When selecting shirts and trousers they should be selected with an ultraviolet protection factor (UPF) rating of 40 to 50 plus. Take particular care to ensure loose fitting clothing is not worn near plant or machinery with moving parts.
6. As well as suitable clothing, sunscreen should be used when appropriate. Broad-spectrum sunscreens rated at a factor of at least SPF 15 plus should be applied to dry skin 15 to 30 minutes before going out into the sun and reapplied every two hours.
7. 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.
8. 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.
9. People can absorb 150mL to 250mL of water every 15 minutes to 20 minutes. It is recommended that before starting work 500mL 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

1. 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 conditions and high vehicle traffic areas.
2. Pressure equipment must be commissioned in accordance with the manufacturers specifications.
3. Establish a testing and servicing program in which operating controls and safety relief valves are tested and maintained at regular intervals.

4. To prevent damage to the valve seats, make sure that safety and relief valves are always tested under pressure in controlled environment.
5. Never operate pressure equipment with a malfunctioning safety relief valve.
6. Position compressor air intakes away from contaminated atmospheres.
7. Install air coolers and air driers to minimise condensate build up.
8. Ensure air pressure equipment is drained to avoid condensate build up.
9. Ensure persons are adequately trained to operate and maintain pressure equipment.
10. Engage a competent person to inspect and service pressure equipment.
11. A boiler log book must be kept for boiler operation.
12. Records must be kept of the commissioning and all maintenance work performed on pressure equipment.

Control measures for air compressors

1. 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.
3. Lubrication in accordance with manufacturer specifications.
4. Air pressure vessels should be drained daily to reduce condensate.
5. Isolate and bleed any pressure components before carrying out repairs.
6. Where compressors start automatically, display signage on the compressor to warn persons of the automatic starting feature.
7. Perform regular maintenance checks on all compressors and safety devices according to manufacturer specification. Keep a maintenance log 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 AS 4343-2005 Pressure equipment*, 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 based on 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, as listed below:

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

1. When using compressed air:
 - high pressure compressed air above 50kpa should not be directed towards a person
 - safety chains or safety locking devices to be used 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.
2. 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 plant from all energy sources and de-energising any stored energy. Isolation integrity is maintained by a means of lockout or tag out (LOTO) system.

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

Energy sources which may need to be isolated 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, disconnecting air, hydraulic or steam lines 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 should be developed and used as required.
7. All affected personnel should be notified before the plant is re-energised.
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 replaced or new plant is introduced.
9. Alternate control measures and safe work procedures should be implemented where isolation and LOTO procedures are not practicable, i.e. trouble shooting, fault finding, calibration or adjustment etc. around live equipment. This type of work should only be conducted by competent persons.

5.14 Electrical

Electrical hazards in sawmills may include:

- 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 2013](#) has specific requirements for electrical safety management, including testing and inspection of equipment and safety switch protection. The two classes of work relevant to sawmills 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 one or two 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 one or two 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

Relevant legislation, codes of practice and standards for controlling electrical hazards include the [Electrical Safety Act 2002](#) and associated [Electrical Safety Regulation 2013](#), [Electrical Safety Code of Practice 2013](#), [Managing Electrical Risks in the Workplace](#), [Electrical Safety Code of Practice 2010](#), [Working Near Overhead and Underground Electric Lines](#) and AS/NZS Standard 3000. These documents detail a number of controls to manage electrical hazards, including.

Live overhead and underground power lines

- Consultation with the entity or persons in control of live power line to determine exclusion zone applicable when workers or operating plant 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 it is not reasonably practical to ensure a safe distance of a person or plant from the powerlines.
- Development of a safe system of work when a person, plant or equipment are required to work within the designated exclusion zone of overhead energised head power lines.
- Before any excavation work is performed, underground cables are located and appropriate safety measures to prevent contact are implemented.

Main electrical room, switchboard and distribution boards

- Appropriate signage (e.g. danger electrical power, restricted entry) 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 dry and dust free environment.

- Access to the main switchboard room and distribution boards free from obstructions to a minimum distance 600mm 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.
- Installation and testing of residual current devices (safety switches) on socket outlet circuits.

Plant and equipment

- An identifiable assessable 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 equipment such as socket outlets and light fittings for correct class and rating for the hazards presented in their environment.
- Checking of electrical equipment such as socket 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.
- Ensure tools, cord extension sets and portable outlet devices are suitable for the work, properly tested and maintained in good condition
- 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 licenced 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:
 - toxic substances

- flammable substances
- pressurised substances.
- Mistaken identification of contents.

Controls for pipeline identification

Colour coding of pipe work

1. 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.
2. Timber treatment/preservatives - *these* are black in colour.
3. 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.
4. Fire services - these are coloured red even though they carry a material that could be classified elsewhere.
5. Oil, fuel, lubricating oils, petrol, diesel and other light fraction fuels (combustible liquids) - these are coloured brown.
6. 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 spacing intervals no greater than eight metres 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 50m.

5.16 Asbestos

Asbestos hazards

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

While asbestos is now banned from use in Australia, 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 in them can contain asbestos.

Controls for asbestos

The *Work Health and Safety Regulation 2011* calls up the national codes of practice for controlling asbestos risks:

- *How to Manage and Control of Asbestos in the Workplaces Code of Practice 2011.*
- *How to Safely Remove Asbestos Code of Practice 2011.*

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 *Work Health and Safety Regulation 2011* 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 *How to Manage and Control of Asbestos in the Workplaces Code of Practice 2011*, 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 *Work Health and Safety Regulation 2011* and sections 11.6 and 11.8 of the *How to Manage and Control of Asbestos in the Workplaces Code of Practice 2011* 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 *How to Manage and Control of Asbestos in the Workplaces Code of Practice 2011*.

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/New Zealand Standard AS/NZS 60825.1* 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 one 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 two 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 two lasers, inadvertently 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 two 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 three and four 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
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 *Work Health and Safety Regulation 2011* 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 duty to provide amenities is on the PCBU, 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
 - 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 PCBU 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 PCBU 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.

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 hazards and risks and how these can be controlled.
2. **Site specific induction**, which includes information on site specific hazards, methods of work and any health and safety requirements relevant to the site. **Work centre induction**, which details how to perform specific work duties, including knowledge of safe work procedures.

Competency training

A PCBU should ensure its workers are competent in work functions they will undertake. PCBUs should use nationally recognised industry competency standards and assessment procedures (where available) to determine, certify and record worker competency.

Work health and safety training

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

- workers responsibilities in relation to WHS
- hazard and incident reporting
- health and safety 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 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 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 should 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

The PCBU should 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.

Helmets	An industrial safety helmet and appropriate accessories conforming to current Australian Standards should be used by each person exposed to the risk of head injury. Helmets must be worn at all times in a hard hat area.
Protective footwear	Protective footwear, conforming to current Australian Standards should 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.
Hearing protection	Hearing protection should be worn at all times a person is exposed to risk. All people should wear hearing protection where exposure to noise exceeds 85 dB(A). The hearing protector should be chosen with regard to the level of protection required in consideration of the level of noise exposure. Hearing protectors should comply with current Australian standards.
Leg protectors	Cut proof trousers or chaps must be worn by any person exposed to risk of injury from inadvertently touching the legs with a chainsaw. They should be replaced when they no longer provide full protection.
Safety gloves	Gloves conforming to Australian Standards and appropriate to the task should be worn by any person requiring hand protection (e.g. 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.
Eye protection	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.
High visibility clothing	An outer garment made of highly visible materials should be worn at all times when a person is working in sawmills. Highly visible reflective clothing must be worn for night work. They should be close fitting or tucked in to avoid entanglement in machinery.
Respiratory protective devices	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 Incidents and injuries

Effective work health and safety (WHS) management aims to prevent 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:

1. WHS incident and/or injury recording and data analysis

2. incident investigation
3. WHS incident and/or injury reporting.

WHS recording and data analysis

While an effective WHS management system is based on pro-active measures to prevent incidents 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 equipment failure, fire, substance release or other event that result in damage to or loss of, plant and equipment, processes, environment and structures.
- **Dangerous events and near misses** - events that could have caused an injury, illness or incident.

The PCBU 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.

Incident investigation

Incidents must be investigated to get factual information that can be used to prevent recurrences. Any incident, 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 incident'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.

Whilst recording an incident will detail 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.

Incident reporting

Notifiable incidents have to be reported to Work Health and Safety Queensland within 24 hours.

The Act and the *Safety in [Recreational Water Activities Act 2011](#)* set out what sort of incidents are notifiable to WHSQ. An incident is notifiable *if it arises out of the conduct of a business or*

undertaking and results in the death, serious injury or serious illness of a person or involves a dangerous incident.

The scene of the incident is not to be interfered with unless necessary to prevent further injury to persons or damage to equipment, without permission of an inspector (or a police officer).

A PCBU is required to notify of an incident immediately after becoming aware that a notifiable incident arising from the business or undertaking has occurred.

For afterhours notification, call 1300 362 128. Your notification details will be referred to a WHSQ on-call inspector who will contact you to obtain further details.

If you make the notification by telephone, written notification is not required. WHSQ will provide the person notifying for the business or undertaking with details of the information received.

A PCBU must, under the *Electrical Safety Regulation 2013*, notify the regulator once they become aware of a serious electrical incident (SEI) or dangerous electrical event (DEE) arising out of the conduct of their business or undertaking. <https://www.worksafe.qld.gov.au/laws-and-compliance/incidents-and-notifications>

Incidents can be notified to WHSQ on our website, worksafe.qld.gov.au.

5.22 First aid

A PCBU should 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 in the workplace code of practice 2014* states ways to manage first aid at a workplace and a PCBU must do what the code says or adopt and follow a way that gives equal or better protection.

A risk assessment will assist determine:

- 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 PCBU should 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 PCBU should develop emergency procedures. These procedures should include:

- effective response to an emergency
- evacuation procedures
- notifying emergency services
- means by which serious traumatic injury cases receive earliest possible access to treatment (medical treatment and assistance)
- communications
- testing of emergency plan
- 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.
- information, training and instruction of workers in accident/emergency procedures.

Emergency procedures should have regard to:

- the nature of work and hazards on site (e.g. hot, pressurised vessels used, toxic chemicals stored and used, large fire load from stored timber)
- the size and location of the site (e.g. remote location will affect response times from emergency assistance)
- the number and composition of the workforce.

The emergency procedures must be documented. The PCBU must ensure all workers are aware of these procedures. Implement fire safety procedures and provide appropriate firefighting equipment. Fire extinguishers and hoses should be easily seen and accessible. Workers should be trained in the use of the firefighting equipment.

Emergency procedures should be in place in the event a fire is 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 Health and safety representatives

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

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

After conducting an internal investigation a HSR may:

- 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 WHSQ is contacted to resolve an issue.

If the issues are not satisfactorily resolved by the employer or self-employed person, the HSR may notify a WHSQ inspector.

5.25 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 work health and safety
- considering training and education needs to address work 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 work health and safety
- providing the employer with advice on how to address work health and safety issues.

5.26 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 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 Emergency Service](#) 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.

5.27 Contractors, suppliers and visitors

The safety of all persons on site is the responsibility of the PCBU. All contractors, suppliers and visitors should 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 sawmills 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:
 - site hazards
 - site rules and personal protective equipment
 - emergency and evacuation procedures
 - incident reporting and first aid
 - visitor and contractor responsibility.
3. Restricted access.
4. Supervision and escorting.
5. Work method statements from contractors.
6. Appropriate site signage.

5.28 Psychosocial hazards

Psychosocial and worker health and well-being hazards in the workplace include:

- workplace bullying

- work-related stress
- work-related violence
- drugs and alcohol
- work-related fatigue
- worker health and well-being.

Workplace bullying

Workplace bullying is defined as repeated and unreasonable behaviour directed towards a worker or a group of workers, that creates a risk to health and safety. Repeated means there are multiple instances of unreasonable behaviour, and there may be a range of different behaviours over time. Unreasonable behaviour means anything that an ordinary person would see as unreasonable, given the specific circumstances, and including behaviours that victimise, humiliate, intimidate, or threaten other people.

Workplace bullying does **not** include the following behaviours:

- A single incident of unreasonable behaviour, however, this should not be ignored as it may be repeated and therefore constitute as bullying.
- Reasonable management action taken in a reasonable way by the person's employer in connection with the person's employment.
- Behaviour that involves violence.
- Acts of unlawful discrimination of sexual harassment (for more information see the *Anti-Discrimination Act, 1991*).
- Differences of opinion or disagreements between work colleagues.

Bullying 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.

The risk of workplace bullying can be minimised as far as is reasonably practicable by using a combination of control measures that target the organisational level and individual worker behaviours. These preventative controls include:

1. Secure management commitment to identify, prevent, and respond to workplace bullying (e.g. modelling respectful behaviours, implementing a bullying policy, taking reports of bullying seriously, and consulting with workers).
2. Establish clear standards of workplace behaviour (e.g. develop and implement a workplace bullying policy that is consistently applied).
3. Develop productive and respectful relationships at work (e.g. providing leadership training, implement mentoring, encourage teamwork and cooperation).
4. Design safe systems of work (for more information see [Safe Work Australia's handbook – Principles of good work design](#)).
5. Implement bullying reporting and response procedures.

6. Provide training and information (e.g. raising awareness of what constitutes bullying and the organisation's policy towards it).

More information about controlling workplace bullying is provided in [WHSQ Guide for preventing and responding to workplace bullying](#).

Drugs and alcohol

Alcohol and drug use may contribute to workplace injuries resulting from poor physical coordination, impaired judgement and decreased alertness. PCBUs have a legislative duty to ensure that workers are not at risk of injury due to drug and alcohol use in the workplace. This can be achieved by using a risk management approach to identify the hazards, assess the risks and implement strategies to address them. Develop a **drug and alcohol management policy** in consultation with your workers and other relevant people.

Control measures for drugs and alcohol

1. Consultation

Consultation between employers, workers and their representatives is essential if the risk to health and safety associated with alcohol and drug use 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 HSRs. 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 and drug 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

Fatigue refers to physical and/or mental exhaustion that impairs work performance and reduces a worker's ability to function normally. Fatigue management requires close consultation and cooperation between leaders and workers because fatigue is a function of factors that are both internal and external to the workplace. This means that it is possible for workers to experience fatigue at work due to situations encountered at home.

Contributing factors to fatigue include the following:

- Lack or loss of sleep (in general, we require seven-eight hours sleep per day).
- Long periods of wakefulness (fatigue tends to increase after 12 hours awake).

- Sustained mental or physical effort (e.g. focussed attention/concentration and heavy physical duties).
- Disruption to circadian rhythms (e.g. rotating shift work pattern).
- Inadequate rest breaks.
- Health and emotional issues (e.g. mental illness).
- Time of day that work occurs (e.g. starting work at 3am).

Fatigue can be difficult to identify, however, the following behaviours may be observed in fatigued workers:

- Excessive yawning or falling asleep on the job.
- Inability to concentrate and recall information.
- Difficulty speaking to others coherently.
- Impaired decision-making and judgment.
- Reduced hand-eye coordination.
- Repeatedly arriving late for work.
- Increased unplanned absences from work.

Given the subjective nature of fatigue, it is important to control fatigue at the source through elimination of fatigue-inducing factors. However, when elimination is not reasonably practicable, then the risks must be minimised. Example controls that eliminate or reduce the risk of fatigue include the following:

1. Developing a fatigue policy that covers aspects of work such as maximum shift length and weekly hours, fatigue risk assessment practices, work-related travel parameters, and procedures for managing fatigued workers.
2. Consulting regularly with workers to identify both sources of fatigue within the workplace and also in their home environments, permitting the implementation of suitable controls.
3. Designing the environment and the work so that fatigue-inducing characteristics are either removed or reduced, such as rotating workers through different tasks, providing rest facilities, installing low-vibration plant and equipment, and ensuring adequate lighting and ventilation.
4. Scheduling work in a way that reduces the likelihood of fatigue, for example, timing high demand tasks for the middle of shifts, filling vacant positions as soon as possible, implementing a policy on maximum working hours, and considering leave/absence requests when scheduling work.
5. Designing work rosters to reduce fatigue, such as limiting start times before 6am, avoiding split shifts where possible, monitoring overtime, overlapping shifts to allow handover, and keeping sequential night shifts to a minimum.
6. Training leaders to recognise situations where fatigue is likely and providing them with the soft-skills to develop a psychologically-safe work environment where workers feel comfortable to raise situations when they feel fatigued.

More information about controlling fatigue risks is provided in Safe Work Australia's [Guide for managing the risk of fatigue at work](#).

Work-related stress

Work-related stress refers to the physical, mental, and emotional reactions of workers (including leaders) who perceive that their job demands exceed their abilities and/or resources to do the work effectively. Stress is a sign that the person is not coping. Importantly, stress in itself does not automatically lead to a psychological or physical injury. In fact, a moderate level of stress for brief periods is helpful for work motivation and performance. However, when stress is chronic and/or severe in intensity, it can lead to mental and physical injury.

Individuals respond to stress in markedly different ways. It is the interaction of individual characteristics with their environment that creates a subjective experience of stress. This means

that one source of stress may be perceived as far greater to some workers as compared to others. Further, this indicates that leaders should work to eliminate sources of excessive and intense stress where possible, and for sources that remain, implement controls that take into account the vulnerabilities of each person in the workplace.

There are a number of organisational risk factors that can create significant stress for workers, which include:

- Excessive job demands (e.g. long working hours).
- Low control (e.g. inability to choose when breaks are taken, lack of input into decisions that affect work).
- Poor support (e.g. negative leadership style).
- Lack of role clarity (e.g. being unclear about what tasks are required in the job).
- Poorly managed relationships (e.g. entrenched conflict between peers).
- Low levels of recognition or reward for good performance.
- Poorly managed change (e.g. introducing a new technology without providing training to workers).
- Unfairness or organisational injustice (e.g. inconsistent application of disciplinary procedures).

Controls that eliminate or reduce the effects of prolonged and intense stress include the following:

1. Consulting with workers to identify sources of stress and potential controls.
2. Improving leadership style and skills through implementing training to managers and supervisors.
3. Engaging in work planning practices that take resourcing and work flow into account, reducing the occurrence of time pressure.
4. Setting clear performance goals and targets for workers to achieve.
5. Making sure that job descriptions match what is actually done in practice by workers.
6. Adhering to good principles of change management (e.g. workforce consultation, training, communication).

For more information about controlling stress in the workplace, please refer to [WHSQ Managing work-related stress](#).

Work-related violence

Work-related violence is any incident where a person is abused, threatened, or assaulted at work. Examples of work-related violence include:

- Biting, spitting, scratching, hitting, and kicking.
- Throwing objects.
- Pushing, shoving, tripping, and grabbing.
- Verbal threats, armed robbery, and sexual assault.
- Attacking with any type of weapon.

Work-related violence can occur from persons external to the workplace, such as members of the general public, and internal to the workplace, such as customers or clients. Incidences of work-related violence may not only be mandatory reportable events under the Act (2011), but also fall under the jurisdiction of law enforcement agencies such as the police.

Importantly, violence carries risks to both physical and psychological health. Long after physical signs have been healed, psychological distress may linger, such as post-traumatic stress disorder. Therefore, given the duties on persons conducting a business or undertaking to ensure the health and safety of workers and others in the workplace, it is important to eliminate sources of violence if possible. If this is not possible, controls can help to reduce the likelihood and severity of injury.

Suitable controls to eliminate or reduce the effects of work-related violence include the following:

1. Develop a work-related violence policy that is visibly supported by management and outlines such matters as what constitutes violence, likely sources of violence, organisational response procedures, criteria for notifying police and obtaining support, and post-event support resources for affected workers.
2. Consulting with workers to identify work-related violence hazards, determine their risk, and identify suitable controls.
3. Ensure the physical safety of the work environment (e.g. installing CCTV cameras, preventing public access to the premises where appropriate, fitting alarm systems).
4. Set clear expectations around acceptable and unacceptable behaviours for workers, and if appropriate, clients/customers who engage with your business or undertaking.
5. Providing training to help workers recognise triggers of, de-escalate, and respond to work-related violence scenarios.
6. Develop administrative controls that describe how to deal with aggression or abuse in the workplace.

For more information on controlling occupational violence, please refer to [WHSQ Guide to preventing and responding to work-related violence](#).

Worker health and wellbeing

A safe and healthy sawmill will not only benefit workers, but has been linked to better business outcomes. Focusing on the health and wellbeing of your workers can:

- improve workplace culture and employee relations
- improve workplace performance and productivity
- reduce injury and absence.

Health and wellbeing in your sawmill is providing an environment which supports workers to lead a healthy lifestyle. Unhealthy lifestyle behaviours can have a direct impact on the sawmill's work health and safety performance. The most relevant preventable health behaviours include a worker who is overweight or obese, smokes, drinks excessive alcohol, takes drugs, has poor nutrition and is physically inactive. Table 1 highlights the health risk for workers within the manufacturing industry, compared to the national workforce in Australia.

Prevalence of modifiable lifestyle risk factors in the manufacturing industry						
Analysis of persons 18+ years	Current smoker	Inadequate fruit and veg intake	Physical inactivity	Over-weight or obese	Increased high risk waist circumference	Alcohol increased lifetime risk
National 2014/2015	14.6%	50.3%	61.9%	62.1%	57.4%	19.5%
Manufacturing 2014/2015	18.4%	54.9%	68.5%	67.9%	58.2%	21.9%
Manufacturing 2007/2008	30%	55%	75%	60%	53%	28%

Table 1: Health risk factors for workers within the manufacturing industry, compared to the national workforce in Australia.

Industry factors contributing to poor health

There are many factors contributing to these results:

- **Work design:** Shift work, irregular hours, sedentary work, time pressures, exposure to hazards and difficulty accessing healthy food.
- **Demographics:** Aging and male dominated workforce (older workers have higher rate of injury and illness and males are less likely to seek medical assistance).
- **Wage structure:** performance based wage structure and casual employment causes reluctance to take leave for sickness or holidays.

For more information on the manufacturing industry, visit our website worksafe.qld.gov.au.

How to improve health and wellbeing in your workplace

A healthier, safer and more productive sawmill is one where workers and managers collaborate to continually improve the health, safety and wellbeing of all workers. A work health and wellbeing program considers the work environment, the type of work and develop initiatives that are designed to make healthy choices the easy choices for workers.

The work health planning guide is an interactive five step guide designed to support business work through each stage of developing an effective workplace health and wellbeing program. The guide can be accessed by visiting the work health planning guide.

The five steps to workplace health and wellbeing.

1. Management commitment.
2. Wellness planning.
3. Needs assessment.
4. Action plan.
5. Evaluation.

5.29 Site security

Sawmills can be attractive targets for vandals, children and thieves. The safety of all persons on site is the responsibility of the PCBU. The PCBU should implement controls to prevent unauthorised access to the site.

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:
 - all plant and equipment isolated to prevent operation
 - buildings and access to fixed ladders locked and secured against entry
 - mobile plant shut down, locked out and keys removed
 - kilns and treatment vessels secured shut
 - burners not in operation secured shut
 - valves on pipelines protected against unauthorised operation
 - power tools and small equipment locked away
 - fuel bowsers locked out.

Appendix 1 Checklists

Checklists assist in managing common health and safety risks in sawmills. 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 or part of this guide. The checklists are separately available in excel spreadsheet format, with a summary sheet and separate pages for each topic.

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 dangerous goods
- 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 Incidents and injuries
- 5.22 First aid
- 5.23 Emergency planning
- 5.24 Work health and safety regulations
- 5.25 Safety committees
- 5.26 Fire safety
- 5.27 Contractors, suppliers and visitors
- 5.28 Psychosocial hazards
- 5.29 Site security

Appendix 2 Hazard identification register

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

Risk calculator

Section F: Risk calculation. The **consequences** have been rated in levels 0 to 5, the lower the number the lower the risk level and **likelihood** has been categorised from 1 to 6. The risk rate is determined by multiplying the level number by the category number. (E.g. **likelihood 2 x category 3 = 6** which is a **moderate** risk).

Note: Once the consequence level is selected, the **likelihood** within that **level of the consequence** happening before and after the controls are installed must be calculated.

The consequence levels of 1 and 0 are the only levels that can be combined unless the hazard has been removed from the work area.

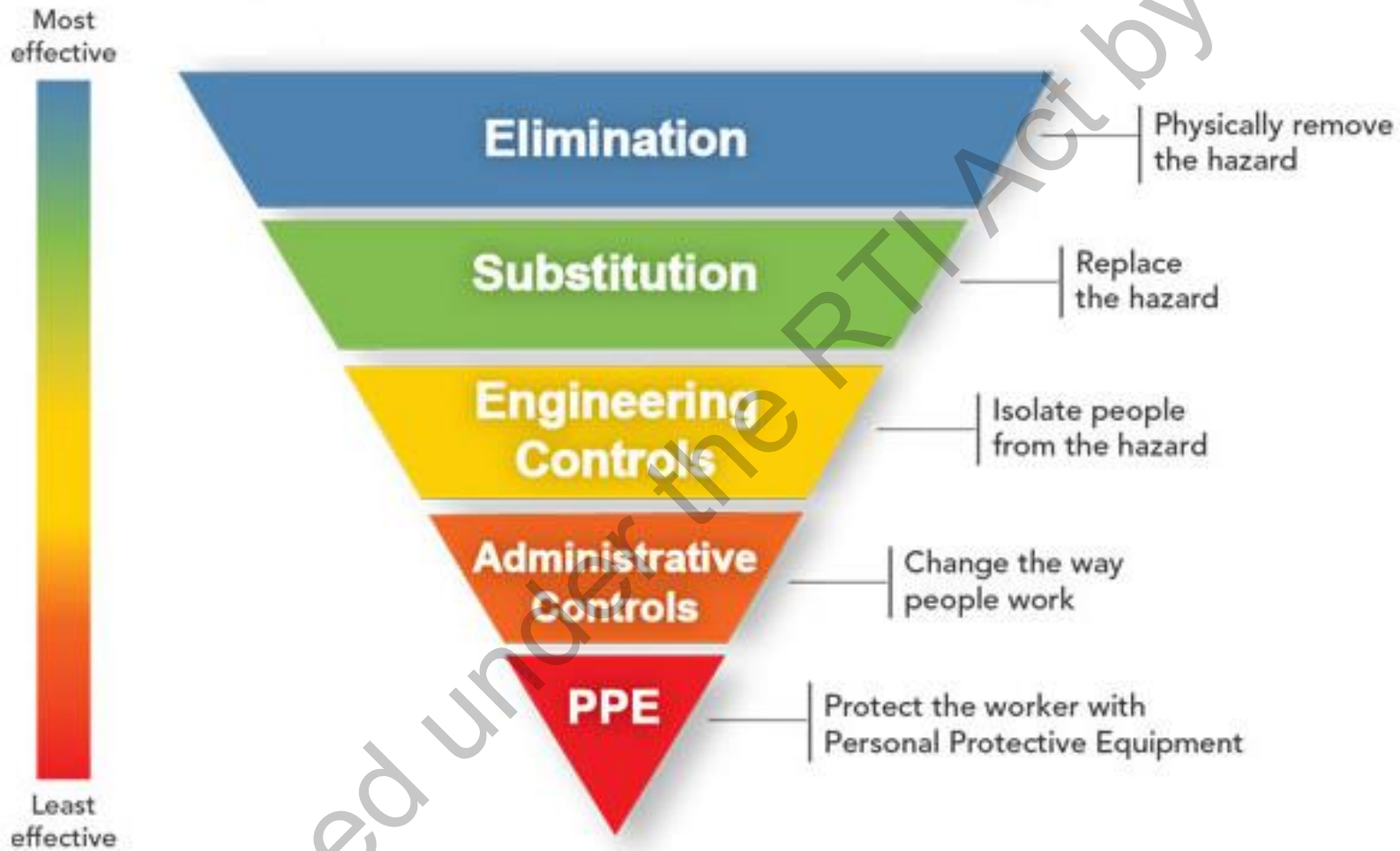
When assessing electricity, the consequence will always be catastrophic but the likelihood of it happening will change when controls are installed.

Likelihood <i>How likely will it happen?</i>	Category	Consequences (How severe the injury, loss or damage will be if it happens)?					
		Catastrophic <i>Fatalities or long term environmental impact. Financial loss >\$10M</i>	Major <i>Extensive injuries and/or long term environmental impact. Financial loss >\$1M</i>	Moderate <i>Medical treatment or environmental impact rectified with outside help. Financial loss >\$100K</i>	Minor <i>First aid treatment or environmental impact easily rectified. Financial loss >\$10K</i>	Insignificant <i>Action required to minimise the risk of Incidents or environment impact. Financial loss < \$10K</i>	Negligible <i>No impact upon objectives or outcomes, no incidents or environmental impact.</i>
		Level 5 risk	Level 4 risk	Level 3 risk	Level 2 risk	Level 1 risk	Level 0 risk
Almost certain <i>Is expected to happen</i>	6	30-A	24-A	18-A	12-H	6-M	0-VL
Likely <i>Will occur in most cases</i>	5	25-A	20-A	15-H	10-H	5-M	
Possible <i>May occur at sometime</i>	4	20-A	16-H	12-H	8-M	4-L	
Unlikely <i>Might happen at sometime</i>	3	15-H	12-H	9-M	6-M	3-L	
Rare <i>May occur only in exceptional circumstances</i>	2	10-H	8-M	6-M	4-L	2-L	
Very rare <i>Not expected to happen</i>	1	5-M	4-L	3-L	2-L	1-VL	

Section G: Determine the action required

Risk rate	Action required
0-1 = Very low (VL)	No further action required, reassess if objectives or outcomes can't be achieved.
2-4 = Low (L)	Ok for now, continue to monitor and review when performing task/s.
5-9 = Moderate (M)	Follow company procedures.
10-16 = High (H)	Seek assistance from the job supervisor to select the controls measures required, to lower the risk to an acceptable level, before the task can commence.
18-30 = Acute (A)	Urgent – stop the task or activity and make safe. Senior management decision required before the task or activity can recommence.

HIERARCHY OF CONTROLS



Appendix 3 Job safety analysis form

Name of organisation completing the work:			Job name:		
Task:			Job number:		
Workplace:			Job location:		
Date job safety analysis (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 4 Incident notification form example

Office of Industrial Relations

Form 3 Incident notification form

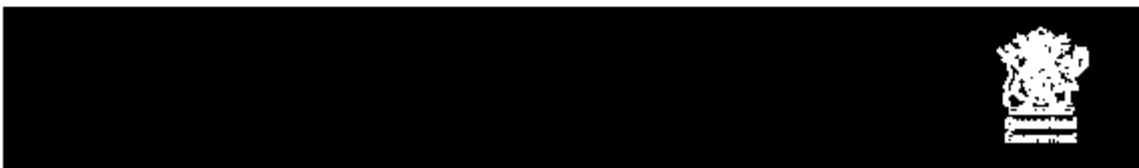
V4.11-2013

Work Health and Safety Act 2011

Safety in Recreational Water Activities Act 2011

Electrical Safety Act 2002

Incident details	
Incident type	
Please refer to the guide to work health and safety incident notification or electrical safety incident notification web page for assistance.	
This is to notify of a: <input type="checkbox"/> death <input type="checkbox"/> serious injury <input type="checkbox"/> serious illness <input type="checkbox"/> dangerous incident <input type="checkbox"/> serious electrical incident <input type="checkbox"/> dangerous electrical event	
Provide an explanation of the type of incident using the categories on the guide to work health and safety incident notification or electrical safety incident notification web page (e.g. a category of 'serious injury' is 'immediate treatment for serious head injury').	
Incident date, time and location	
Date of incident:	Incident address:
Time of incident:	Postcode:
Describe the specific location of the incident (e.g. aisle 3, plant operation room, tower crane the Elizabeth Street entrance side of the site.)	
Description of the incident Please provide as much detail as possible, for instance: the events that led to the incident; the work being undertaken when the incident happened; the overall action, exposure or event that best describes the circumstances that resulted in the injury, illness, fatality or dangerous incident; the object, substance or circumstance which was directly involved in inflicting the injury, illness, death or dangerous incident; the name and type of any machinery, equipment or substance involved. Was anyone else involved? Was electricity or electrical equipment involved?	
<i>(Attach a separate piece of paper if necessary)</i>	
Did the incident involve licensed work (e.g. high risk work, electrical work?)	
<input type="checkbox"/> No <input type="checkbox"/> Yes Please provide details of the type of licensed work:	
Is the workplace a registered major hazard facility? <input type="checkbox"/> No <input type="checkbox"/> Yes	



Further information

Workplace Health and Safety Queensland and Electrical Safety Office

- worksafe.qld.gov.au
- 1300 362 128

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 3873 - Pressure equipment – Operation and maintenance
- AS 1210 - Pressure vessels

Laser safety

- AS/NZS 60825 – Safety of laser products

Noise

- Managing noise and preventing hearing loss at work code of practice 2011

Hazardous chemicals

- Australian Standard, AS1940: The storage and handling of flammable and combustible liquids
- Australian Standard, AS3780: The storage and handling of corrosive substances
- Australian Standard, AS/NZS 4452: The storage and handling of toxic substances

Confined spaces

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

Plant

- [Managing risks of plant in the workplace code of practice 2013](#)
- AS 1473-1991 – Guarding and safe use of woodworking machinery
- AS 1473.1-2000 – Wood processing machinery - Primary timber milling machinery
- AS 1473.2-2001 – Wood processing 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 – Band sawing 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 in the workplace code of practice 2014](#)

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

- [How to manage work health and safety risks code of practice 2011](#)
- [Hazpak – A guide to basic risk management \(NSW\)](#)
- [Electrical safety code of practice 2013 Managing electrical risks in the workplace](#)
- [Electrical safety code of practice 2010 Working near overhead and underground electric lines.](#)

Other Australian Standard publications

- AS 4024.1 series - Safeguarding of machinery
- AS 1657 - Fixed platforms, walkways, stairways and ladders - design, construction and installation
- AS/NZS 3000 – Electrical installations (known as the wiring rules)
- AS/NZS 3760 - In-service safety - Inspection and testing of electrical equipment AS 1270 - Acoustics - Hearing protectors
- AS/NZS 1336 - Eye and face protection - Guidelines
- 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 and workplace lighting - General principles and recommendations
- AS 1680.2 - Interior and workplace lighting - Recommendations for specific tasks and interiors
- AS/NZS 2269 - Plywood - Structural
- AS 1336 Eye protection
- AS 4343 Pressure equipment – Hazard levels