

**Draft
Code of Practice**

**MANAGING RISKS OF PLANT IN
RURAL WORKPLACES**

DRAFT FOR PUBLIC COMMENT

This draft model Code of Practice for *Managing Risks of Plant in Rural Workplaces* has been developed to support the model Work Health and Safety (WHS) Act and Regulations, developed by Safe Work Australia under the *Intergovernmental Agreement for Regulatory and Operational Reform in Occupational Health and Safety*.

Since 1 January 2012, six jurisdictions have implemented new WHS laws based on the model WHS laws: Queensland, New South Wales, Tasmania (with a commencement date of 1 January 2013), the Northern Territory, the Australian Capital Territory and the Commonwealth.

The use of agricultural machinery is linked with a high number of work-related deaths and injuries. This draft Code aims to provide practical guidance for duty holders who manage or control plant used for primary production in rural workplaces on how to eliminate or minimise the risks.

What is the purpose of public comment?

Feedback is sought on whether the scope and application of this Code is appropriate including whether it:

- is helpful and easy to understand
- reflects the current state of knowledge and technological developments in relation to managing risks associated with the use of plant in rural workplaces
- has an appropriate level of information or is too detailed including whether the information would be better dealt with in specific guidance, rather than a code
- includes appropriate diagrams or whether there may be other/better examples (note: the images in this code are examples only and will be converted into line drawings for improved clarity)
- requires additional examples or case studies to provide further clarification.

In addition to the above, feedback is sought on the following issues:

1. Referencing technical standards (e.g. Australian Standards)

There are a wide range of Australian Standards that apply to plant, which competent persons should be aware of and apply as required, for example, in design and manufacture or inspection and testing. Rural plant is often altered in the workplace to suit local requirements and the information in technical standards may be appropriate in these circumstances. However, technical standards can be revised at any time and they may or may not provide the most appropriate information in relation to managing health and safety risks.

There is a view that codes of practice should not reference Australian Standards unless the entire standard is relevant, as it places an expectation on duty holders to comply not only with the code, but also with the referenced standard. Small businesses may have fewer resources to purchase Australian Standards than larger businesses. Comment is sought on whether it is necessary to reference particular technical standards in the Code of Practice.

2. Inclusion of guidance for two-wheeled motorcycles

The code covers a range of plant, in particular, tractors and quad-bikes. Two-wheeled motorcycles are another vehicle commonly used for a range of tasks, including general transportation, in rural workplaces. Motorcycles must be registered for use on public roads and therefore road safety requirements apply. Comment is sought on whether guidance should be included on the safe use of motorcycles in rural workplaces.

The draft model Codes of Practice have been developed to reflect the requirements of the model WHS Regulations and include references to specific regulations. Comments should not focus on the regulations themselves but on the guidance that is needed to comply with the WHS Regulations.

How do you make a submission?

You can provide your comments as an individual or you may wish to contribute to a joint submission through your employer or union organisation, professional association, safety group or community forum. It is encouraged that wherever possible, you should include evidence and examples to support your views on the draft model code.

A Public Comment Submission Cover Sheet and the Public Comment Response Form are provided for making written submissions. These are available on the Safe Work Australia website at www.safeworkaustralia.gov.au.

It is preferred that submissions are typed and submitted electronically to the following email address: codes@safeworkaustralia.gov.au. If you are unable to email your submission, you can post it to:

Safe Work Australia
Attn: Codes Public Comment
PO Box 641
Canberra ACT 2601

When a submission is received by Safe Work Australia via email, an automatic response will be sent to confirm receipt. We do not send individual responses to submissions received by mail.

All submissions will be made accessible to the public on the Safe Work Australia website, unless marked 'IN CONFIDENCE'.

The closing date for making a submission is **Friday 24 August 5:00 pm AEST**.

What happens after the public comment period closes?

Safe Work Australia will analyse all written submissions that are received during the public comment period. Safe Work Australia will review and as necessary revise the model Codes of Practice.

The revised model Codes of Practice will then be considered by the Ministerial Council for adoption as part of the harmonised WHS laws.

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FOREWORD

This Code of Practice on managing risks associated with plant used in rural workplaces is an approved code of practice under section 274 of the *Work Health and Safety Act* (the WHS Act).

An approved code of practice is a practical guide to achieving the standards of health, safety and welfare required under the WHS Act and the Work Health and Safety Regulations (the WHS Regulations).

A code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in the WHS Act, in relation to the subject matter of the code. Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks which may arise. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are designed to be used in conjunction with the WHS Act and Regulations and may be used in any court proceedings under the WHS Act or Regulations in determining what is reasonably practicable in the circumstances to which the code relates.

Compliance with the WHS Act and Regulations may be achieved by following another method, such as a technical or an industry standard, if it provides an equivalent or higher standard of work health and safety than the code.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice.

This Code of Practice has been developed by Safe Work Australia as a model code of practice under the Council of Australian Governments' *Inter-Governmental Agreement for Regulatory and Operational Reform in Occupational Health and Safety* for adoption by the Commonwealth, state and territory governments.

A draft of this Code of Practice was released for public consultation on 8 June 2012 and was endorsed by the Select Council for Workplace Relations on [to be completed].

SCOPE AND APPLICATION

This Code provides practical guidance for persons who conduct a business or undertaking and have management or control of plant used in rural workplaces on how to manage the risks associated with this type of plant. This Code is applicable to farmers, self-employed contractors, primary producers and businesses that supply, repair or carry out other activities involving agricultural machinery.

This Code should be read in conjunction with the Codes of Practice for *Managing Risks of Plant in the Workplace* and *Safe Design, Manufacture, Import and Supply of Plant*.

How to use this Code of Practice

In providing guidance, the word 'should' is used in this Code to indicate a recommended course of action, while 'may' is used to indicate an optional course of action.

This Code also includes various references to provisions of the WHS Act and Regulations which set out the legal requirements. These references are not exhaustive. The words 'must', 'requires' or 'mandatory' indicate that a legal requirement exists and must be complied with.

1 INTRODUCTION

Rural workplaces such as farms use many types of plant and machinery that may cause serious injury and death due to poor design or unsafe use, for example:

- limbs amputated by unguarded moving parts
- being crushed or thrown from mobile plant such as a quad bike
- sustaining fractures from falls while accessing, operating or maintaining plant
- electrocution or burns from plant that is not adequately protected or isolated.

In rural workplaces, these injuries can often be suffered by somebody's spouse, parent or child.

1.1 What plant is used in rural workplaces?

A **rural workplace** is a place where primary production is carried out including:

- the cultivation of any agricultural crop or product whether grown for food or not
- the rearing and management of livestock
- the classing, scouring, sorting or pressing of wool
- aquaculture
- flower or vegetable market gardens
- clearing, fencing, trenching, draining or otherwise preparing land for any purpose identified above.

Plant includes the following items used to carry out work:

- a machine or on-farm vehicle (for example a tractor)
- any tool, equipment or apparatus powered by an energy source or manually operated (for example a manually or mechanically powered auger)
- any component of and anything fitted or connected to the item of plant (for example a tractor-mounted post-driver).

Examples of plant used in rural workplaces include:

- planters, harvesters, balers, cultivators, and pickers
- tractors, front end loaders and quad bikes
- power take offs or power input connections
- mowers, slashers, brush cutters, chainsaws, augers, posthole diggers, and post drivers
- silos and hoppers
- workshop tools such as drills and grinders
- irrigation equipment, pumps and generators.

Although the WHS Regulations for plant do not apply to hand-held plant (plant that relies exclusively on manual power for its operation) the general duty of care under the WHS Act does apply to this type of plant.

1.2 Who has health and safety duties in relation to plant used in rural workplaces?

A **person conducting a business or undertaking** has the primary duty under the WHS Act to ensure, so far as is reasonably practicable, the health and safety of workers while the workers are at work in the business or undertaking and to ensure that the health and safety of other persons is not put at risk from work carried out as part of the business or undertaking. This duty includes ensuring, so far as is reasonably practicable:

- the provision and maintenance of safe plant
- the safe use, handling, storage and transport of plant.

The WHS Regulations include specific duties for a person conducting a business or undertaking with management or control of plant, as well as requirements for powered mobile plant and plant that lifts or suspends loads.

If you own plant you will be the person with management or control of that plant. If you hire or lease an item of plant you have management or control of that plant for the period that you have hired it for and will have responsibility for health and safety together with the person you have hired or leased it from.

Designers, manufacturers, importers and suppliers of plant must also ensure, so far as is reasonably practicable, that the plant they design, manufacture, import or supply is without risks to health and safety.

Designers, manufacturers, importers and suppliers also have duties to provide information about the plant to enable other duty holders to fulfil the responsibilities they have in managing the risks associated with it. Information must be passed on from the designer through to the manufacturer and supplier to the end user.

Further guidance is available in the *Code of Practice: Safe design, Manufacture, Import and Supply of Plant*.

Officers, for example company directors and farm owners, have a duty to exercise due diligence to ensure that the business or undertaking complies with the WHS Act and Regulations. This includes taking reasonable steps to ensure that the business or undertaking has and uses appropriate resources and processes to eliminate or minimise risks that arise from plant used in the workplace.

Workers have a duty to take reasonable care for their own health and safety and must not adversely affect the health and safety of other persons. Workers must comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to health and safety at the workplace. A worker must not interfere with, misuse or render safety measures ineffective, for example, by removing guarding. A worker should report any faults in the plant (such as faulty control switches, missing guards) to their manager or supervisor as soon as they become aware of them.

Other persons at the workplace, such as visitors, must take reasonable care for their own work health and safety, take reasonable care that their acts or omission do not adversely affect the health and safety of other persons, and must comply, so far as they are reasonable able, with any reasonable instruction given by the person conducting the business or undertaking to allow that person to comply with the WHS Act.

1.3 What is involved in managing risks associated with plant?

R. 203: A person with management or control of plant at a workplace must manage risks to health and safety associated with the plant.

R. 34-38: In order to manage risk under the WHS Regulations, a duty holder must:

- identify reasonably foreseeable hazards that could give rise to the risk
- eliminate the risk so far as is reasonably practicable
- if it is not reasonably practicable to eliminate the risk, minimise the risk so far as is reasonably practicable by implementing control measures in accordance with the hierarchy of control
- maintain the implemented control measure so that it remains effective, and
- review, and if necessary revise, risk control measures so as to maintain, so far as is reasonably practicable, a work environment that is without risks to health and safety.

Chapter 2 of this Code provides guidance on how to manage the risks associated with plant in rural workplaces by following a systematic process that involves:

- identifying hazards

- if necessary, assessing the risks associated with these hazards
- implementing and maintaining risk control measures, and
- reviewing risk control measures.

Guidance on managing the risks of plant generally is available in the *Code of Practice: Managing Risks of Plant in the Workplace*.

Consulting workers

S. 47: The WHS Act requires that you consult, so far as is reasonably practicable, with workers who carry out work for you who are (or are likely to be) directly affected by a work health and safety matter.

S. 48: If the workers are represented by a health and safety representative, the consultation must involve that representative.

Consultation involves sharing information, giving workers a reasonable opportunity to express views and taking those views into account before making decisions on health and safety matters.

Consultation with workers and their health and safety representatives is required at each step of the risk management process. By drawing on the experience, knowledge and ideas of your workers you are more likely to identify all hazards and develop effective risk controls.

It is important to consult your workers as early as possible when planning to introduce new plant or make any changes that may affect their health and safety.

Consultation, cooperation and coordination of activities with other duty holders

S. 46: The WHS Act requires that you consult, cooperate and coordinate activities with all other persons who have a work health or safety duty in relation to the same matter, so far as is reasonably practicable.

There may be other businesses involved with plant at your workplace, for example, those who carry out installation or repairs, or who share the workplace with you. These businesses are often independent contractors who may work alone when servicing a rural property so it is important that everyone consults and exchanges information on the work they are to do, the related hazards and the risk controls to be used.

Further guidance on consultation requirements is available in the *Code of Practice: Work Health and Safety Consultation, Cooperation and Coordination*.

2 MANAGING RISKS WITH PLANT

2.1 Identifying the hazards

Identifying hazards involves finding all of the things and situations that could potentially cause harm to people. Hazards associated with plant generally arise from:

- the plant itself - for example, hazards associated with a tractor include those relating to its electrical, hydraulic and mechanical power sources; its moving parts; its load-carrying capacity and operator protection, and
- how and where the plant is used - a tractor, for example, may have hazards arising from the kind of loads it is used to move and the slope or evenness of the ground.

Inspect the plant

Inspect each item of plant in your workplace and observe how it is used. Talk to your workers to find out what their experience is with the plant they operate, inspect or maintain.

If you have hired or leased plant, you should also consult the person who owns the plant about any potential hazards because you both have responsibility for ensuring that the plant is safe.

When identifying hazards, you should think about all the activities that may be carried out during the life of the plant at your workplace, such as installation, commissioning, operation, inspection, maintenance, repair, transport, storage and dismantling. For each of these activities, you should consider whether:

- the plant could cause injury due to entanglement, falling, crushing, trapping, cutting, puncturing, shearing, abrasion or tearing
- the plant could create hazardous conditions due to harmful emissions, fluids or gas under pressure, electricity, noise, radiation, friction, vibration, fire, explosion, moisture, dust, ice, hot or cold parts
- the plant could cause injury due to poor ergonomic design—for example, if operator controls are difficult to reach or require high force to operate.

Factors to consider include:

Condition

- what is the general condition of the plant? How old is it?
- what is its service and maintenance history?
- how much has the plant been used (constantly or rarely)?

Suitability

- how suitable is the plant for its intended purpose? Is it actually being used for its intended purpose? If not, what hazards arise from this unintended use?
- how suitable are any attachments or accessories? In what condition are they?

Location

- how does the plant affect the safety of the area where it is located or being used? Consider its impact on the design and layout of the workplace.
- can workers gain safe access without the risk of slips, trips and falls (walkway, gantry, elevated work platform, fixed ladders)?

Abnormal situations

- what abnormal situations, misuse or fluctuation in operating conditions can you foresee?
- what effects would failure of the plant have? Would it result in loss of contents, loss of load, ejection of work pieces, explosion, or collapse of parts?
- is it possible for the plant to move or be operated inadvertently?

An example of a checklist that can help identify hazards is provided at *Appendix A*.

2.2 Assessing the risks

Risk is the likelihood that death, injury or illness might result because of the hazard, for example if the rotating parts of a slasher are unguarded the likelihood of coming into contact with the flails or blades is high.

A risk assessment can help you determine:

- how severe a risk is
- whether existing control measures are effective
- what action you should take to control the risk, and
- how urgently the action needs to be taken.

A risk assessment is unnecessary if you already know the risk and how to control it.

To assess the risk associated with the plant hazards you have identified, you should consider:

What is the potential impact of the hazard?

- how severe could an injury or illness be? For example, lacerations, amputation, serious or fatal crushing injury, burns
- what is the worst possible harm the plant hazard could cause?
- how many people are exposed to the risk?

How likely is the hazard to cause harm?

- could it happen at any time or would it be a rare event?
- how frequently are workers exposed to the hazard?

Other factors that may affect consequence and likelihood include:

- the local site conditions, including access and ground slope
- other conditions under which the plant is used (for example, in a confined space, dusty environment)
- any specialised plant or work methods required
- if there are other people or items of plant in the vicinity, what effect do they have?
- what exposures might occur, such as noise or UV rays and local weather conditions?
- where and when is access required during installation, operation, maintenance and in an emergency?
- what work practices and procedures exist in relation to plant safety (for example isolation to carry out maintenance, emergency shutdown)?
- what kind of training, information, instruction and supervision is provided to workers and other persons who may be exposed to hazardous plant?
- does the plant's safety depend on the competency of its operators?
- how is work organised? For example:
 - pedestrian and vehicular traffic around the plant
 - time spent on repetitive tasks
 - any production incentives that may affect health and safety
 - operator fatigue.

2.3 Controlling the risks

The ways of controlling the risks associated with plant are ranked from the highest level of protection and reliability to the lowest. This ranking is known as the *hierarchy of risk control*. The WHS Regulations require duty holders to work through this hierarchy to choose the control that most effectively eliminates or minimises the risk in the circumstances. This may involve a single control measure or a combination of two or more different controls.

The hierarchy of risk control

Elimination – The most effective control is to remove the hazard or hazardous work practice associated with the plant.

Many hazards can be eliminated before introducing plant into your workplace, that is, in the planning and purchasing stages. For example, purchasing machinery that is designed and built to produce low noise levels is more effective than providing workers with personal hearing protection. This also avoids costly modifications to plant after it is purchased.

If elimination is not reasonably practicable, you must minimise the risk by:

Substitution - substitute the plant (or hazardous parts of it) with plant that is safer. For example, replace a quad bike with a side-by-side to reduce the risk of roll-over on uneven terrain.

Isolation – separate the hazardous plant from people, either by distance or physical barrier. For example, use a guardrail or fence to isolate other persons such as children or bystanders from work areas where hazardous plant is used.

Engineering controls – involve carrying out physical modifications to make the plant safer. For example:

- providing a rollover protective structure (ROPS) and seat belt to prevent injury if a roll-over occurs
- redesigning the electrical system to allow for the installation of emergency stop buttons, within easy reach of plant operators, where entanglement may occur
- installing a blower/filler pipe to a feed silo to remove the risk of falling from height or entanglement in overhead power lines if they are present
- installing guards to cover rotating machinery parts.

Administrative controls – if risk remains, it must be minimised by implementing administrative controls, so far as is reasonably practicable. Administrative controls include:

- providing safety signage
- training workers in the proper procedures and processes for operating plant.

Personal Protective Equipment (PPE) – any remaining risk must be minimised with suitable clothing and equipment, such as providing outdoor workers exposed to ultraviolet (UV) radiation with long sleeved shirts and trousers, wide brimmed hat, sunglasses and sun screen to minimise the UV risk. Other types of PPE include gloves, hearing protectors, hard hats and face shields (see Figure 1).

There may be times whereby a long-term strategy to use higher-order control measures may require the short-term use of personal protective equipment. For example, you may decide to provide hearing protectors to workers while you wait for modifications to be made to existing plant.

Administrative control measures and personal protective equipment rely on human behaviour and supervision, and used on their own, tend to be least effective in minimising risks.



Figure 1: Chainsaw operator wearing PPE.

Combining control measures

In many cases, a combination of control measures will provide the best solution. For example, protecting workers from flying debris when using a saw may involve guarding the blade, isolating the work area and using PPE such as a face shield.

2.4 Maintaining and reviewing risk control measures

The control measures that are put in place must be reviewed and, if necessary, revised to make sure they work as planned and that no new hazards have been created by the control measure.

R. 37: Control measures must be maintained so that they continue to protect workers and other people from the hazards associated with plant. The control measures must be:

- fit for purpose
- suitable for the nature and duration of the work
- installed, set up and used correctly.

R. 38: A person conducting a business or undertaking must review and as necessary revise control measures:

- when the control measure is not effective in controlling the risk
- before a change at the workplace that is likely to give rise to a new or different health and safety risk that 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.

The control measures that are implemented must be reviewed and, if necessary, revised to make sure they work as planned and that no new hazards have been introduced by the control measures. Controls can be checked by using the same methods as in the initial hazard identification. Common methods include workplace inspection, consultation, testing and analysing records and data.

You should consult your workers to obtain feedback on the plant and work processes being used and consider the following questions:

- are the control measures, for example guards, working effectively in both their design and operation?
- have all hazards associated with the plant been identified?
- has the purchase of a new item of plant made the job safer?
- are safety procedures being followed?
- has an incident occurred in relation to the plant?
- if new legislation or new information becomes available, does it indicate current controls may no longer be the most effective?

When deciding how frequently to carry out a review, you should consider the level of risk (high risk plant may need more frequent review) and the type of plant involved (there may be particular stages in the life of the plant where a more frequent review is needed).

3 USING PLANT IN RURAL WORKPLACES

3.1 Purchasing and hiring plant

Many injuries associated with plant in rural workplaces occur due to a failure to select the right equipment for the job. Before plant is purchased, you should confirm that it is suitable for the intended use. To do this you should plan the work to be carried out using the plant and identify whether the plant design and construction is suited to the work and the environment it will be used in. Discuss your needs with the plant supplier, who must provide you with information about:

- the purpose for which plant was designed or manufactured
- the results of any calculations, analysis, testing or examination, and
- any conditions necessary for the safe use of the plant.

The information should also be provided when, for example, a safeguard is purchased separately from the plant. In this instance, information should include the correct method of attachment or installation of the safeguard.

Before purchasing, hiring or leasing plant you should also determine:

- the hazards and risks associated with installation, commissioning, operation, inspection, maintenance, repair, transport, storage and dismantling of the plant
- the manufacturer's recommendations in relation to the frequency and type of inspection and maintenance needed
- any special skills required for people who operate the plant or carry out inspection and maintenance
- any special conditions or equipment required to protect the health and safety of people carrying out activities such as installation, operation and maintenance.

You should check whether the plant includes the following characteristics:

- that contact with or access to dangerous parts is prevented
- it is of sturdy construction and has tamper-proof design
- it has fail-safe operation
- it is easy to inspect and maintain
- it does not introduce other hazards (for example, manual handling problems) into your workplace.

When hiring plant, both you and the person you have hired it from must ensure, so far as is reasonably practicable, that the plant is safe to use. During the time that the plant is in your possession you will have control over the way the plant is used in the workplace.

For further information on hiring, installing and commissioning plant in workplace see the *Code of Practice: Managing risks of Plant in the Workplace*.

3.2 Second-hand plant

R. 199-200: A supplier of second-hand plant must ensure, so far as is reasonably practicable, that any faults that may give rise to health and safety risks are identified. The supplier must provide information in writing about the condition of the plant and any identified faults or, if the plant is supplied only for spare parts or scrap, that it is not to be used as plant.

A supplier of second hand plant is someone who sells, exchanges, leases, or hires used plant whether as a principal or as an agent. Examples of a supplier include:

- a person who sells used plant at a retail outlet
- a person who imports used plant for on-sale

- a person who conducts an auction or clearing sale to sell used plant, where that person takes possession of the plant.

The supplier must provide you with information in writing about the condition of the plant, any identified faults and if relevant, that the plant should not be used until the faults are rectified.

Where plant has been in service prior to purchase and information regarding safe use is not available, a competent person should be engaged to assess the plant and develop this information.

3.3 Design and item registration

Schedule 5 of the WHS Regulations identifies certain plant designs and items of plant that are required to be registered before they are used (referred to as 'registrable plant'). Registrable plant used in rural workplaces includes boilers, air compressors, vehicle hoists and boom-type elevating work platforms used in orchards.

A person with management or control of registrable plant must keep a record for that plant.

Detailed guidance on these requirements is in the *Code of Practice: Managing Risks of Plant in the Workplace*.

3.4 Modifying plant used at a rural workplace

R. 244: If the design of an item of plant registered under Part 1 of Schedule 5 is altered and the alteration may affect health or safety, the altered design must be registered.

R. 282: The WHS regulator must be notified in writing if the item of plant is altered to an extent or in a way that requires the plant to be subject to new control measures or the item of plant is usually fixed and is relocated.

The modification of plant can include a variety of changes. A simple modification may not alter the design of the plant or the way it operates. However a substantial modification can alter the design characteristics of the original plant and affect its safety. For example, a substantial modification may alter the stability of the plant or the strength of its supporting parts.

A person who modifies plant used at a rural workplace has the same obligation as a designer and a manufacturer under the WHS Regulations.

If you need to modify plant, you have several options including:

- sending the plant to the manufacturer/supplier for modification
- sending the plant to a local engineering workshop with the expertise to undertake the work safely, or
- undertaking the work yourself if you are a competent person.

Substantial modifications to plant can create new risks to health and safety. If you undertake substantial modifications yourself, you should take the following action:

- gather sufficient information, preferably from the manufacturer or a relevant technical standard, about the plant as this will enable you to include appropriate safety controls when undertaking a modification
- undertake an assessment of the modification using all the information gathered to ensure the safety control measures mitigate risk. You should implement further control measures for any risks highlighted in the assessment.

If you are unsure of your assessment, get independent advice. You should only modify plant in ways recommended by the manufacturer or other documented procedures.

Modification of safety equipment already located on the plant should not be undertaken. For example, the welding of brackets onto a rollover protective structure or the drilling of holes may affect structural integrity, which will dramatically reduce the protective ability of the structure.

You must include information on all plant modifications and the implemented control measures when training workers or other persons who will use the plant.

3.5 Guarding plant

R. 208: If guarding is used, the person with management and control must ensure that:

- if access to the area of plant requiring guarding is not necessary during operation, maintenance or cleaning, the guarding is a permanently fixed barrier,
- if access to the areas requiring guarding is necessary during operation, maintenance or cleaning, the guarding is an interlocked physical barrier,
- if it is not reasonably practicable to use a permanently fixed barrier or an interlocked physical barrier, the guarding is a physical barrier that can only be altered or removed using a tool, or
- if it is not reasonably practicable to use a permanently fixed barrier, an interlocked physical barrier or a physical barrier fixed in position, the guarding includes a presence-sensing safeguarding system.

Guarding must:

- be of solid construction and securely mounted so as to resist impact or shock
- prevent by-passing or disabling of the guard
- not create a risk in itself (for example it must not obstruct operator visibility, weaken the plant, cause discomfort to operators or introduce new hazards such as pinch points, rough or sharp edges)
- be properly maintained
- control any risk from potential broken or ejected parts and workpieces
- allow for servicing, maintenance and repair to be undertaken with relative ease, and
- if guarding is removed the plant cannot be restarted unless the guarding is replaced.

A guard is a physical or other barrier which prevents contact with moving parts or controls access to dangerous areas of plant. Guarding is installed to prevent workers getting clothing or body parts caught by a piece of plant or to prevent work pieces being expelled from the plant and striking people. This includes situations where it is necessary to carry out servicing and maintenance.

Chapter 4 of this Code provides guidance in relation to guarding specific types of plant used in rural workplaces.

3.6 Plant with hot parts or material

Contact with hot plant parts or material ejected from plant may cause serious burns. Examples include:

Hazard	Example
molten material	oxy torch and welding
hot metal shavings	drilling metal
hot gases	a radiator overheating
naked flames	a cane torch
plant parts at high temperature	the exhaust system of a tractor
hot liquids	oil lines and hydraulics

Control measures to eliminate or minimise the risk include guarding or shielding the hazard, effective maintenance of plant and personal protective equipment.

3.7 Overhead electric lines

R. 166: A person conducting a business or undertaking must ensure, so far as is reasonably practicable, that no person, plant or thing at the workplace comes within an unsafe distance of an overhead electric line.

If this is not reasonably practicable, the person must ensure that a risk assessment is conducted in relation to the proposed work and control measures implemented are consistent with the risk assessment and, if an electricity supply authority is responsible for the electric line, any requirements of the authority.

Contact with overhead electric lines can pose a risk of electrocution when operating plant. It can be extremely difficult for plant operators to see electric lines and to judge distances from them.

Careful planning and preparation is essential to ensure that work is done safely when operating plant in the vicinity of overhead electric lines. Consideration should be given to:

- identifying the nature of the work, the height and voltage of electric lines and the proximity of the plant to overhead electric lines
- consulting the electricity supply authority about the work and complying with any conditions imposed by them
- eliminating the risk by arranging for the electricity supply authority to isolate the electricity supply for the duration of the work
- establishing and implementing approach distances to energised electrical conductors and no-go zones in the work area
- providing an effective communication system between workers at the site
- ensuring a safety observer is used whenever mobile plant is in motion and is likely to come closer than the approach distances
- ensuring the operator has the appropriate training and competency to undertake the work
- emergency rescue procedures.

Approach distances to energised electrical conductors are set out in the *Code of Practice: Working in the Vicinity of Overhead and Underground Electrical Lines*. This Code also provides information about the type of controls that should be in place when work is undertaken within unsafe distances.

3.8 Transporting plant

Before transporting plant, you should ensure that the plant is secured and there is no risk to health and safety. Road and traffic authorities may have specific requirements which need to be met when travelling on a public road, such as over-width permits.

The risk of plant contacting overhead electrical lines should also be considered (for example, when relocating a grain silo or a windmill).

Electricity supply authorities should be contacted to ascertain specific requirements where there is a risk of contacting overhead electric lines. Other utilities such as water, gas or telecommunications should be investigated to ensure that any proposed relocation does not interfere with those services.

3.9 Storing plant

Plant that is not in use should be immobilised and stored:

- so as not to hinder or interfere with the operation of any other plant
- in a stable position so that the plant does not fall onto a person
- to prevent unintentional activation – for example, by a person leaning on the controls
- so access is not obstructed
- to prevent deterioration to the extent that the plant later becomes unsafe to use.

3.10 Training, information, instruction and supervision

S. 19 The WHS Act requires a person conducting a business or undertaking to provide relevant information, instruction, training and supervision necessary to protect all persons from risks to their health and safety arising from the work carried out.

R. 39 The WHS Regulations require that a person conducting a business or undertaking must ensure that information, training and instruction provided to a worker is suitable and adequate having regard to:

- the nature of the work carried out by the worker
- the nature of the risks associated with the work at the time of the information, training and instruction, and
- the control measures implemented.

The training provided must be readily understandable by any person to whom it is provided.

Before plant is used in your workplace, you must provide your workers and other persons who are to use plant with the information, training, instruction or supervision that is necessary to protect them from risks arising from the use of plant.

You must also provide the necessary safety information to persons who are involved in installing and commissioning of plant, using plant, testing plant as well as decommissioning, dismantling or disposing of plant. This should include information on the types of hazards and risks the plant may pose to the person when they are carrying out these activities.

Operators should have ready access to the manufacturer's instructions for safe operation of the plant. These instructions should be readily available wherever possible.

You should develop safe work procedures that include instructions on:

- the use of guarding and other control measures
- how to safely access and operate plant
- who may use an item of plant, for example only authorised or licensed operators
- how to carry out inspections, cleaning, repair, maintenance and shut-down, and
- emergency procedures.

Training programs should be practical and 'hands on' and take into account the particular needs of workers, for example, literacy levels, work experience and specific skills required for safe use of the plant.

Supervisors should take action to correct any unsafe work practices associated with plant as soon as possible, otherwise workers may think that unsafe work practices are acceptable.

High risk work licences

Certain types of plant, such as industrial lift trucks and some types of cranes, require the operator to have a high risk work licence before they can operate the plant. Schedule 3 of the WHS Regulations sets out the classes of high risk work licences and the types of plant involved, for example forklifts.

4 CONTROLLING RISKS OF SPECIFIC TYPES OF RURAL PLANT

4.1 Tractors

Tractors are common items of plant in rural workplaces. Many rural fatalities are associated with the use of tractors, especially in roll over and run over incidents. This has happened regardless of the size of the farm and the age or type of tractor.

Agricultural tractors include a broad range and variety of vehicles, from around half a tonne in weight to more than 25 tonnes. Tractors may be rigid or articulated, on tyres or tracks, two-wheel drive, front wheel assist and four-wheel drive, single or multiple-wheeled per axle.

Safety features that should be addressed at the design, manufacture and operation stage include:

- roll-over protective structures (ROPS)
- falling object protective structures (FOPS)
- guards, for example for power take-offs (PTOs)
- safe means of access
- protection from noise and ultraviolet radiation exposure
- other measures for operator health and safety, for example seat belts.

Tractors handle a variety of attachments. Even if the tractor itself is well set up for safe use, a new attachment may introduce a new set of hazards. Planning and selecting the correct equipment for the intended task is a key step. You should think through the tasks, consider the type of equipment necessary and the terrain you will encounter, to ensure you select the right combination of tractor and attachment.

Any tractor attachment, such as a front end loader (FEL) attachment, must only be used for the purpose for which it was designed. For example, large round hay bales cannot be lifted safely using a FEL bucket.

Carrying passengers on mobile plant, including tractors, is not permitted unless the passenger is provided with a level of protection that is equivalent to that provided to the operator, such as a proper passenger seat and roll-over protection.

Roll-over protective structures (ROPS)

R. 216: The person with management or control of a tractor at a workplace must ensure that the tractor is not used unless it is securely fitted with a roll-over protective structure.

If the tractor is used in a place that is too low for the tractor to work while fitted with a ROPS, the structure may be lowered or removed while the tractor is in that situation, but only if other measures to minimise the risk of roll over are in place.

A roll-over protective structure is designed and constructed to prevent or minimise the risk of death or injury to the operator of a tractor as a result of the tractor rolling over in any direction. ROPS will not prevent a roll-over but will protect the operator from being crushed in the event the tractor overturns.

Tractors can overturn anywhere, including on:

- level ground
- uneven ground
- slight and steep slopes
- edges of depressions
- contour banks or water courses
- when towing/pulling light, heavy, stable and unstable loads.

ROPS should always be used in conjunction with a seat belt to prevent the operator being projected into the crush zone should an incident occur.

A fold-down ROPS with a locking device may be more practical to use where a tractor is operating inside or close to buildings, or near trees (see Figure 2).



Figure 2: Tractor with a fold-down ROPS fitted - note the locking pins (see arrow).

The WHS Regulations also describe the following tractors that are exempt from the requirement to have a ROPS fitted:

- has a mass of less than 560 kg, or a mass of more than 15 000 kg; or
- is installed in a fixed position, and in a manner which would not permit it to be used as powered mobile plant, or
- is being used for a historical activity or purpose (heritage plant).

A tractor that is exempt from having a ROPS fitted should not be used at a workplace unless all the proposed activities have been assessed for the risks to health and safety and the owner has taken all reasonable action to either prevent or control these risks.

Compliant ROPS may be available for early model tractors, even as far back as 1945. If these are unavailable from the manufacturer, a ROPS testing centre may supply an approved frame, or test a home designed frame.

A ROPS in service has a limited lifespan and inspections should identify any sign of physical deterioration (for example, dents, rust or cracks, may indicate problems). Cracks and fatigue often affect the mountings or brackets and these should be regularly inspected for any signs of deterioration.

The structural integrity of a ROPS can be adversely affected by continuous impact or corrosion and this may be indicated by deformation or cracking of the structure. A ROPS in this condition should be replaced.

ROPS design and construction

Designers and manufacturers of tractors should ensure that tractors capable of rollover are either designed for a ROPS to be fitted or are fitted with a ROPS. The design and construction

of a ROPS is a skilled operation. Technical standards can provide additional guidance on the design of a suitable protective structure.

The safety of a ROPS is dependent upon the frame yielding and absorbing energy to reduce the load transmitted to the mounting bolts and tractor body.

This type of design reduces the likelihood of continuous rollover while at the same time protecting the operator. A rigid frame, while being strong enough to withstand the rollover, may break the mounting bolts on the tractor, or may suddenly fracture rather than yield. The performance of a ROPS under stress can only be determined by conducting a test to the relevant Australian Standard or equivalent overseas standard.

An approved ROPS is usually tested in accordance with procedures outlined in the technical standards by a ROPS testing centre (see Figure 3).



Figure 3: ROPS being tested by destructive methods at an approved testing centre.

A manufacturer should ensure that every ROPS approved under a technical standard is legibly and permanently marked with the following information:

- the name and address of the manufacturer of the ROPS
- ROPS identification number
- make, model or serial number of the tractor(s) the structure is designed to fit, and
- the relevant Australian Standard or other technical standard with which the structure complies.

Falling Object Protective Structure (FOPS) on tractors

If a tractor is capable of being used for tree felling or in other situations which create a risk to the operator of falling objects, then the tractor should be designed for a falling object protective structure (FOPS) to be fitted. FOPS is a system of structural members and mesh sheeting attached to a tractor to provide the operator with protection from falling objects, for example branches, rocks and bales.

A manufacturer should that every FOPS approved under a technical standard is legibly and permanently marked with the following information:

- the name and address of the manufacturer of the FOPS
- FOPS identification number
- make, model or serial number of the tractor(s) the structure is designed to fit

- the relevant Australian Standard or other acceptable technical standard with which the structure complies, and
- any other information deemed appropriate by the manufacturer (for example installation, repair or replacement information).

Access platforms

Tractor access platforms can provide a physical barrier between the tractor operator and the wheels of the tractor while the operator, or an assistant, gets on to or off a tractor (see Figure 4). The devices prevent an operator from being positioned between the front and rear wheels of a tractor and therefore less likely, should the person slip or fall, to be drawn under the wheel if the tractor moves unexpectedly. Many major tractor manufacturers already incorporate safe access platforms in the design of their machines and after-market suppliers are able to provide engineered access platforms for older machines.



Figure 4: Tractor access platform

Power take-off (PTO) attachments and guards

The PTO on a tractor can rotate at greater than 500 RPM which is too fast for an operator to pull clear from an entanglement. The PTO, shaft, and universal joints should be inspected regularly for wear and all guards maintained and replaced when they are damaged or worn.

The selection of the most appropriate attachment for the intended task is important as is the selection and fitting of a suitable PTO guard. Many injuries have occurred as a result of the PTO shaft being fitted incorrectly or where operators are not trained in the proper use of the device.

PTO guarding (see Figure 5)

The power output coupling (POC) guard is generally known as the master guard. The guard must be permanently attached to the tractor. It may be movable, but capable of being returned and held securely in position when the tractor is in use.

The implement power input coupling (PIC) guard must be permanently attached to the implement. It may be movable, but capable of being returned and held securely in position when in use. There must be no 'nipping point' where body parts or clothing can be caught.

The power take off shaft guard must extend into the tractor POC guard area and the implement PIC guard area for the maximum practical distance. The guard may be of a rotating or non-rotating type. For non-rotating type guards a means of restraining the guard must be provided.

When buying a guard, check with your supplier that it has been made and tested to the appropriate Australian Standard.

Make sure that the guard is the correct size and length for the drive shaft. If in doubt consult the guard manufacturer or supplier. Remember to take into account the shaft's vertical and lateral movements during work.

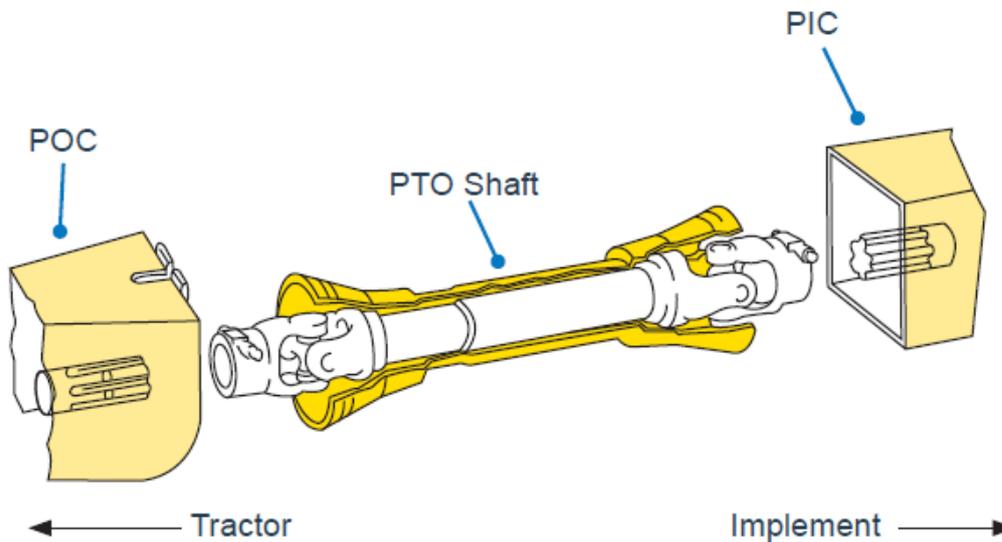


Figure 5: Tractor PTO guard.

For all guards:

- Check all guards regularly, for example, daily when in use for wear and damage. Damaged guards must be replaced before use.
- Where it is necessary to have some form of protection in the PTO drive line, torque limiters, free wheels or clutches should be located at the power input connection (implement end) of the PTO drive shaft.
- The restraining devices used to prevent the rotation of the shaft guard should not be used as a means of supporting the PTO drive shaft/guard when the machine is uncoupled.
- When the machine is not in use, support the drive shaft and guard on the cradle provided. If there is no cradle, support the shaft and guards by other means to give equivalent protection against damage.

When working with PTO equipment always:

- disengage the power drive
- stop the tractor engine
- ensure that controls are in neutral and the handbrake is applied
- remove the engine key, and
- wait for all movement to cease before attempting to clear any blockage and use a tool to clear the blockage.

Front end loader (FEL) attachments

Tractor mounted front end loader (FEL) attachments are widely used in the rural industry and include:

- single or multi-purpose buckets
- pallet forks
- bale and silage spikes
- bale and silage clamps and grapples
- blades and scrapers, and

- lifting jibs.

A FEL attachment is normally connected to a tractor via a sub-frame that is permanently bolted to the tractor (see Figure 6). Positive engagement and secure retention of the FEL attachment under different operating conditions is usually provided by a quick detach and locking system from the sub-frame.



Figure 6: Tractor fitted with a FEL attachment

FEL attachments should be supplied with a support stand which places the arms at the correct height to allow the tractor to be driven in or out when connecting or disconnecting the arms. The support stand should be located on a firm level surface capable of supporting the weight of the unhitched FEL attachment.

Risk assessment

Before using a tractor and FEL attachment, you should complete a risk assessment that considers the operator, machine and environment in which it will operate. When assessing the risks involved with the use of a FEL attachment consider:

- whether the operator has the appropriate level of skill and knowledge
- the potential for carried objects or loads to roll back or fall on the operator
- the capability of the front axle, wheels and tyres of the tractor to accommodate the weight imposed by the FEL attachment when it is fully loaded
- lifting capacity of the tractor's hydraulic system
- is there adequate clearance between tractor front tyres and FEL attachment frame to eliminate contact during turns
- stability of the tractor operating a fully loaded FEL attachment
- appropriateness of the selected FEL attachment to lift the load
- operating conditions related to the density of material to be handled (for example, nature of material and whether wet or dry)
- dimensions of the load to be lifted
- speed of travel which affects stability on bumps or turns
- load height during travel
- terrain surface (direction of slope, evenness and hardness of surface), and
- whether the Rated Operating Load (ROL) of the FEL attachment might be exceeded.

The ROL is the load that can be safely lifted without reducing rear axle weight of the tractor by more than 50% through weight transfer. If exceeded, the rear wheels will start to lift and lose traction increasing instability. Both lateral (sideways) and longitudinal (lengthwise) operating stability may be affected while lifting and moving a load in the raised position because of the equipment, terrain or nature of the operation undertaken.

Risk control

A FEL attachment should not be installed on a tractor unless it is fitted with a Roll Over Protective Structure (ROPS) or a cabin incorporating ROPS. The ROPS should preferably be a four post ROPS or a ROPS forward of the operator to provide a level of protection in the event of an object rolling back from the bucket or lifting mechanism.

Rollback of loads may also be prevented by using:

- specialised lifting attachments (for example bale spike)
- a level lift system
- a rollback guard, and
- lifting height limiting device.

Where there is a risk of objects or material falling onto the operator, the ROPS should be fitted with a Falling Object Protective Structure (FOPS).

The FEL attachment should be matched to the tractor. Each FEL attachment should have a decal or plate specifying its ROL for the tractor model. Seek guidance from the tractor manufacturer that engine capacity and its hydraulic system can provide a satisfactory operating performance from the FEL attachment. The hydraulic system must be able to provide the pressure and flow rate required to lift operating loads of the FEL attachment.

Rear weights or ballast added to tractors fitted with FEL attachments move the centre of gravity rearwards reducing the load on the front axle and improving stability. Ballast may occur as either rear wheel weights, water added to rear tyres and counterweights or a weight box added to the three point linkage. The amount of ballast added will depend on the load capacity of the tractor axle and tyres. The tractor manufacturer's instructions and recommendations should be followed.

Rear ballast also improves lateral stability. By lowering the centre of gravity and moving its position rearward away from the tipping axis, a greater tilt angle (critical tilt angle) must be exceeded before lateral rollover will occur.

Extending rear wheel track also improves lateral stability by further increasing critical tilt angle. However traversing a slope or running with one wheel over an obstacle or in a depression will decrease critical tilt angle. It is important to scan the operating environment to identify visible hazards such as rocks, stumps, depressions or unstable ground.

Quick release hydraulic couplings enable easy attachment and detachment. These should be clearly marked to avoid incorrect connection. All hydraulic pressure should be released before disconnection.

Further guidance on forklifts is available in the [draft] *Code of Practice: Industrial Lift Trucks*.

4.2 Post drivers

Post drivers are a potentially hazardous item of plant and care needs to be exercised in the selection of an appropriate device for the intended use. Post drivers are generally power driven and may also incorporate integrated hydraulic earth auger systems driven by a tractor or other means.

Effective guards must be used to prevent access by the operator and others to moving and other dangerous parts of the post driver while it is in operation. Guards must be designed as an integral part of the post driver and in selecting the most appropriate device, you should check that the device affords proper protection to the operator.

For example, the hammer must be guarded to a reasonable above ground level (for example, height of 2.4 metres) and below the bottom of the hammer's drop height (for example, 300 mm). For post drivers designed to drive posts their entire length into the ground, guards must be no more than 300 mm above ground level and at least 300 mm from the faces of the hammer.

Additional measures may be required to protect the operator from impact from particles ejected during the operation, such as a separate guard at the operator's position or a hammer that encloses the top of the post.

Some operations may require the guard to be temporarily displaced. In such instances, the post driver must allow for the speed of the hammer to be restricted. Other nip, shear and crush points (for example, positional controls, hinged guards) should be designed to prevent shearing and crushing. This may be through guarding or controlling the speed of movement or operation (for example, tilts at a maximum 10°/second, side shift 100 mm/second).

Post drivers intended for replacing posts in existing fences need to be used without damaging the fence. One option is to have a guard comprising horizontal bars only. In such cases, the bars must be rigid (for example, steel not less than 25 mm diameter) and be spaced vertically a safe distance from the outer face/point and sides of the hammer (for example, no more than 150 mm apart and a minimum of 300 mm from the hammer).

All drive belts, pulleys, chains, sprockets and drive shafts must be fully guarded, including 'back guarding', to prevent contact from behind. Chains and sprockets should be fully enclosed for their whole length. For winch-activated post drivers, guards should be provided to prevent physical contact with the nip points between the ropes and sheaves. Means should be provided to prevent ropes from becoming displaced from sheaves.



Figure 7: Tractor mounted post driver

All guards should be secured by an interlocking device which will prevent the post driver operating and automatically stop it should the guards be removed or opened. Where this is not possible, guards should be such that, they cannot be removed without the use of tools. The drop speed of the hammer should be restricted while the guard is opened (for example to limit the drop speed to 100 mm/second).

For guards comprising fixed horizontal bars, a vertical gap may be incorporated in the front of the guard to facilitate positioning of the post and enable the post driver to be withdrawn following the operation. Such a gap should be no more than 250 mm wide. In addition, a guard must be provided at the operating position to protect the operator from particles that may be ejected from the post during the driving operation and to prevent the operator from reaching the post when standing in the normal operating position. This form of guarding must not be used for automatic post drivers.

The manufacturer must provide instructions on the safe use of the post driver, including all limitations on its use, including:

- the means for attaching and detaching the post driver to and from the tractor
- means for safe storage and transport of the post driver
- safe operating instructions
- a warning about overhead powerlines and underground services including the envelope of the plant
- necessary personal protective equipment
- tractor specifications that are necessary for the safe operation and transport of the post driver (for example, mass, width of wheel track, category of linkage)
- details of the inspection and maintenance requirements for separate items and components, and the post driver as a whole, including a pre-operational checklist
- advice that when the post driver is not in operation, it must be immobilised (for example, turned off and key removed from power source), and
- advice on the use of guards.

You will need to ensure that your tractor's characteristics will be compatible with the post driver and that you have a suitable storage area where the post driver will not be subjected to conditions that may affect its operational capability.

4.3 Plant that lifts or suspends loads

R. 219: The person with management or control of plant at a workplace must ensure, so far as is reasonably practicable, that the plant used is specifically designed to lift or suspend the load.

If it is not reasonably practicable to use plant that is specifically designed to lift or suspend the load, the person must ensure that:

- (a) the plant does not cause a greater risk to health and safety than if specifically designed plant were used; and
- (b) if the plant is lifting or suspending persons, the use of the plant complies with regulation 220.

Using plant that lifts people or materials can often involve a high level of risk. The following factors should be considered before using this type of plant:

- the nature of the load and weight being lifted
- the frequency of use
- the systems of work
- movement of the lifting mechanism
- supporting areas and structures
- the stability of the plant and the terrain it is used on

- communication systems
- emergency evacuation of persons from the plant
- protective equipment and safety gear
- periodic structural checks.

The WHS Regulations provide specific requirements for plant that lifts or suspends loads including people.

R. 220: When plant is used to lift or suspend persons, the person with management or control of the plant must ensure that persons being lifted or suspended:

- are in a workbox securely attached to the plant
- remain substantially within that workbox during lifting or suspending
- use safety harnesses if there is any risk of falling from a height, and
- have a safe means of exit if there is a failure of the plant.

No plant other than a crane should be used to suspend a load at the workplace, unless:

- the use of a crane is impracticable
- the load is only travelled with the lifting arm of the plant fully retracted
- stabilisers are provided wherever necessary in order to achieve stability of the plant
- no person is allowed under the hook or suspended load or in any trench adjacent to the plant while it is in operation
- in the case of earth moving machinery, hooks are not used in conjunction with the buckets
- hose burst protection valves are fitted on the boom cylinders
- an appropriate load chart is provided, and
- loads are only lifted where the plant has a specifically designed, load-rated, closed eye designated lifting point

Cranes used to lift a person should include:

- at least two brakes, independent of each other where failure of a brake or any single component in the brake-drive train will not result in loss of control of the load, or
- a brake acting directly on the hoist drum and a hoisting mechanism or other brake capable of holding the load when not under power.

Further guidance on cranes and the use of work boxes with cranes is available in the *Code of Practice: Cranes*.

Set up and safe use of elevating work platforms

To reduce the risk of injury to people who operate elevating work platforms (EWPs) ensure the following occur:

- operators are fully trained in safe work procedures and hold a high risk work licence where required
- boom-type EWPs are provided with an alternative power supply to lower the platform on loss of normal power
- EWPs are regularly inspected and maintained
- EWPs purchased are designed and manufactured to a published technical standard, and
- EWPs are used and maintained in accordance with the manufacturer's instructions or if unavailable, instructions provided by a competent person.

The risk of injury to people can also be reduced through examining tasks and work locations. Identify and assess safety risks by:

- ensuring operations are planned and safe, for example check for soft or uneven ground
- not using an EWP on sloping ground beyond its stated design capability

- ensuring that EWP's designed solely for indoor use are not used outdoors
- ensuring that all operator controls are clearly identified
- keeping safe clearances when working near powerlines, which includes handheld harvesting and pruning equipment
- not exceeding the working load limit (WLL) of the EWP
- not using an EWP above its stated wind speed capability
- not using an EWP that does not have a functioning travel/motion alarm
- ensuring a clean work area around the EWP
- staying within the platform when the EWP is elevated
- using a lookout when the view from the platform is obstructed, and
- ensuring that persons using a boom-type EWP always use a fall arrest system attached to the work platform.

The need for a fall-arrest system for other EWP's should consider:

- height of trees to be harvested or pruned
- EWP stability including ground surface firmness and configuration that may arise from past agricultural practice for example tree stump removal, animal activity, melon holes and cultivated or natural slopes
- presence of any ground obstacles that may contribute to injury if a person were to fall or jump from the platform
- likelihood of the need to rapidly exit or descent due to swarming or biting insects.

4.4 Grain augers

Grain augers are available in many variations including pencil types, transportable and self-propelled variations. An essential consideration in the selection of a grain auger is that effective guarding is in place to prevent access to dangerous parts. The guards must be incorporated as an integral part of the grain auger.

As different grains have different flow characteristics it is recognised that mesh size and other safety features can impede the grain flow. It is important though, that a mesh guard with appropriate apertures is provided (no more than 100 x 100 mm is recommended) as this will enable a sufficient rate of flow while maintaining an acceptable level of safety when used in conjunction with an inner guard. Grain augers with mesh of a smaller aperture will limit the flow of grain and this information should be provided to the user.

The auger or screw flighting must be effectively guarded. This requires two levels of guarding: an inner guard that is permanently fitted over the flighting, and a fitted outer guard. The inner guard must be in position at all times when the grain auger is in use. The outer guard must be in position when using a hopper and wherever practicable for all other applications. Where it is not practicable to use the outer guard and it is removed (for example, when the grain auger is being used in a silo with a narrow discharge chute that the guard will not fit into) persons must not be directly exposed to the auger flighting during operation. In such situations it may be necessary to provide an alternative outer guard. The inner guard should not be relied upon by itself as an appropriate risk control measure.

Before selecting an auger, consideration should be given to other aspects of its intended use, for example:

- Is a safe storage area available?
- Will the auger operate in the vicinity of overhead power lines?
- Will you be able to relocate the auger using existing farm vehicles?

When considering the auger itself, it is important to satisfy yourself that:

- the auger is appropriate for your intended use

- all drive belts, pulleys, chains, sprockets and drive shafts are fully guarded, including guarding to prevent contact from behind
- fixed inner guards have bars that withstand deformation (a maximum 75 mm spacing is recommended)
- removable outer guards (a mesh of maximum 100 x 100 mm apertures is recommended)
- the distance between the inner and outer guards prevents contact with the auger (a minimum of 120 mm is recommended)
- the emergency stop control is adjacent to the auger inlet
- winches are properly guarded to prevent a hand being caught between the winch drum and the wire rope
- wire ropes used for raising and lowering the auger are fastened using swaged, socketed or spliced eyes and thimbles
- the winch drum has a device to ensure correct winding of the rope
- a jockey wheel is provided to aid manoeuvrability
- safety signs warning of risks are clearly displayed
- operating instructions are provided and are housed in a weatherproof receptacle
- the necessary transportation aids are provided
- inspection and maintenance requirements are provided.



Figure 8: Pencil type grain auger

The auger must be operated in accordance with the manufacturer's instructions. The auger should always be emptied and lowered before moving. Appropriate personal protective equipment must be provided to those using the auger and hearing protectors should be worn while the equipment is operating if excessive noise is produced.

4.5 Quad bikes

Quad bikes are four-wheeled agricultural bikes commonly used on farms. They are also known as 'all terrain vehicles' (ATVs), however they are not safe for use in all terrains. Three-wheeled ATVs can still be found on some farms however, three wheeled ATVs are inherently unstable and are no longer manufactured.

Four-wheeled quad bikes are a popular 'workhorse' on the farm. Unfortunately, these vehicles are a cause of fatal and non-fatal incidents each year. A large proportion of quad bike fatalities and injuries result from sideways, backward and forward overturns.



Figure 9: Quad bike

Determine if a quad bike is a suitable vehicle for your needs

It is important to select the right vehicle for your needs. Before purchasing a vehicle, you should take the following three steps:

- identify your needs and relevant rider safety issues
- compare vehicle options to your needs, and
- question suppliers and others with relevant knowledge.

Identify your needs and relevant rider safety issues

Before you visit supplier showrooms, make a list of your needs. Some questions to ask yourself include:

- What tasks will the quad bike be used for? What do you need it to do?
- What are the most common conditions you will be using it in? Is the terrain rocky or hilly, muddy, sandy?
- Which vehicle provides the rider with the greatest level of safety for each task?
- Who will be operating the vehicle? What training do they have, or require? What size and age are they? Do I have the necessary skills and expertise to train the rider(s) or would I need to seek outside trainers?
- What protective gear is required?
- Will there be times when the vehicle is operating on the road?
- What loads and/or equipment will be carried and how much will it weigh?
- Will the vehicle be used to tow trailers or other attachments? If it will, what will be the maximum weight and height the vehicle will be required to tow?

Compare vehicle options to your needs

Quad bikes have a light footprint and are an economical single person vehicle for off-road use. However, a quad bike may not be the most suitable choice when farm work requires more power.

Larger and more powerful quad bikes have become available in recent years. A key safety consideration on larger quad bikes, especially for inexperienced riders, is the aggressiveness of the throttle action when starting off and changing gears while on the move. Therefore larger quad bikes may not be as safe as smaller ones for many tasks, for example, driving.

You should consider other vehicle options if your needs are constrained by the limitations of a quad bike. Small on-road vehicles, two wheel motorcycles or light utility vehicles may be a better choice for many tasks. It is also important to remember that the carrying capacity of the quad bike you may be considering will be reduced by your own weight, the weight of any attachments and the load to be carried in those attachments. Allowing your cattle dog to ride on the quad bike may well add an additional load that will affect stability especially when the dog is jumping on and off at times when critical manoeuvres are being performed.

Selecting a quad bike

Purchase an agricultural or 'workhorse' quad bike, not a sports recreational model. The agricultural model is designed for power, traction and greater stability than recreational versions. There are numerous factors and features to consider when choosing a quad bike for your property.

Major considerations include:

- intended use of the quad bike (for example size of property, age of rider)
- terrain and ground conditions
- power and speed
- gear ratio
- suspension
- centre of gravity
- drive mechanism
- suitability of available attachments and accessories
- brakes
- seat carrying capacity
- if reverse gear is available.

When assessing the risks involved with the use of a quad bike you should consider:

- the vehicle's centre of gravity (usually high)
- the vehicle's track width (usually narrow)
- the vehicle's wheelbase (usually short)
- the vehicle's length of travel suspension (usually long)
- the vehicle's tyre pressure (usually low)
- the weight of attachments and their capacity (for example spray tanks).

All these features can contribute to instability and should be considered in relation to the terrain to be driven on, speed of operation, mechanical condition of the quad bike and rider skill. For example, even a half-full spray tank adds considerable weight to the quad bike and this can have a serious impact on the stability of the vehicle. If the tank does not contain baffles, then the weight of the liquid in the tank is free to move into a position that can be most detrimental to stability. Equally, tools or implements carried un-restrained on a quad bike can be ejected with some force and cause injury to the rider that may in turn cause the rider to lose control.

Attachments should only be used if the attachment has been endorsed and tested for weight distribution and stability by the manufacturer of the attachment.

Quad bikes also pose an increased risk to the user over and above conventional vehicles. The unique design characteristics of these machines generally preclude fitting traditional rollover protective devices which incorporate seatbelts and are therefore not feasible for quads where active riding techniques are required by the rider. However, crush prevention devices are now becoming available, which may assist to provide a space for the rider in the event of roll-over. Research is continuing as to the effectiveness of these devices, and they are therefore not mandatory. Regardless of whether you choose to fit a crush protection device, you must control

the risks of vehicle rollover occurring through a combination of vehicle selection, instruction and training and safe use of attachments.

Risks from the following situations should also be assessed:

- rider struck by an object (for example overhanging branch)
- rollover from striking an object or the terrain being too steep
- leg of rider being caught in rear tyre, chain or foot rest
- loads too heavy, unequally distributed or not secured properly
- rider inexperience with the effects of slope, speed or weight distribution
- fatigue
- poor maintenance of brakes and suspension
- using spray-booms that can be entangled in foliage
- mustering cattle.

Quad bike rider training

Training quad bike riders is an essential step in ensuring that riders understand the many ways that the vehicle can be used at a workplace, the equipment that might be attached and the risks associated with both the vehicle and the work to be done. Rider training might be workplace or task specific, or it might be more general and be provided by a supplier, manufacturer or industry training provider. Often a combination of general and job specific training will be necessary for riders to be sufficiently competent to operate a quad bike safely.

It is important that riders are provided, understand and implement the operating instructions of the quad bike's manufacturer.

Other risk controls include:

- Always wear a properly fitting helmet.
- Never allow passengers on the quad bike unless it has been specifically designed to carry two persons. Carrying passengers on quad bikes which have been designed to carry one person only interferes with the normal dynamics of the vehicle. The added weight will also complicate handling the quad bike up and down slopes, around curves and stopping distances. The rider must adopt a 'dynamic' riding style by transferring the rider's weight from side to side and forward and backwards to counter balance the quad bikes directional mass.
- Never allow any child under the age of 16 to ride an adult-sized quad bike
- Never allow anybody to operate a quad bike who has not had adequate training or may be under the influence of alcohol or drugs.
- Keep children away from the quad bike and its attachment.
- Ensure all guards are in place, particularly foot plates.
- Providing the rider with a means of communication for use in the event of an incident remote from other workers or assistance.

Personal protection

A helmet should always be worn when operating a quad bike regardless of the operating environment. Other protective equipment such as, face shields, goggles, boots or shoes, gloves and appropriate clothing should also be worn. In open terrain operation or in continuous low speed operation, less protective or alternate clothing may be chosen after a risk assessment has been conducted. Be aware of solar radiation and risk of dehydration when selecting PPE.

4.6 Heritage plant

Heritage plant is plant which is intended to be preserved in its current operational form for historical value (for example, a vintage tractor can be used for display or demonstration purposes only) and not for normal use at a workplace.

Further information on the use of heritage plant can be found in the *Guide: Heritage Plant (under development)*.

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APPENDIX A: CHECKLIST FOR RURAL PLANT

Machinery and equipment – result of inspection

- Are moving parts of all power tools properly guarded?
- Are wheels on grinders regularly dressed and tool rests adjusted?
- Are oxyacetylene cylinders vertical and secured in place?
- Are eye goggles, face shields, earmuffs and other items of personal protective equipment readily available and properly maintained?
- Is the compressor properly maintained?
- Which workshop machines and workshop activities generate harmful noise?
- Are safety cages or restraint devices available for repair of tyres?
- Are trolley/hoists present to reduce lifting?
- Is raised equipment securely chocked?
- Are fire extinguishers on hand and regularly maintained?
- Is there a First Aid kit on hand and regularly maintained?

Electrical

- Are all clearances observed and the operator authorised when machinery is working near overhead powerlines?
- Are stay wires of power poles flagged?
- Are underground cables clearly marked?
- Is a safety switch fitted to the electrical circuit board?
- Are all power tools double insulated?
- Are portable power tools unplugged when not in use?
- Are all extension cords three-core flex of tough rubber or plastic sheathing and in good order?
- Is there any water problem posing an electrical risk?

Guarding

- Are guards kept in place when the machinery is in operation?
- Are all moving parts properly guarded?
- Are all machines and powered equipment adequately labelled with safety decals and caution notices?
- Are guards in good working order?

Safe operation of plant and machinery

- Are operator manuals readily available for each machine?
- If not involved in the operations of a machine, are all others, including workers and family members kept away from machinery?
- Are the keys of all machinery removed and stored away from children when not in use?
- Is there a known and observed policy that children are to keep away from machinery (A 'No Rider' policy)?
- Are routine services and maintenance undertaken on all machinery and a record kept?
- Are drivers of any machinery subject to excessive noise?
- Are lights and reflectors clean and functional?
- Are earmuffs or plugs available to operators when necessary?
- Have all people been trained in the safe use of machinery they use and records kept of that training?
- During transport, are hitches sturdy and safety chains connected?
- Do farm machines driven on public roads have appropriate warning signs?
- Is it a known and observed rule that machine power is turned off before adjusting, unclogging or servicing a power-driven machine?
- Are exhaust systems functioning properly?

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