

Rural plant

Code of Practice 2004

This Queensland code of practice was preserved as a code of practice under section 284 of the *Work Health and Safety Act 2011*.

This code was varied by:

- the Minister for Education and Industrial Relations on 27 November 2011 and published in the Queensland Government Gazette on 2 December 2011; and
- the Minister for Education and Minister for Industrial Relations on 1 July 2018.

This preserved code commenced on 1 January 2012.

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Introduction

The *Rural plant Code of Practice* is an approved code of practice under section 274 of the *Work Health and Safety Act 2011* (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 Regulation 2011* (the WHS Regulation).

From 1 July 2018 duty holders are required to comply either with an approved code of practice under the WHS Act or follow another method, such as a technical or an industry standard, if it provides an equivalent or higher standard of work health and safety to the standard required in the code.

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 admissible in court proceedings under the WHS Act and WHS Regulation. Courts may regard a code of practice as evidence of what is known about a hazard, risk or control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice. This may include issuing an improvement notice for failure to comply with a code of practice where equivalent or higher standards of work health and safety have not been demonstrated.

How is the code organised

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 WHS Regulation 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.

Who has duties?

A **person conducting a business or undertaking** (PCBU) has the primary duty under the WHS Act to ensure, as far as reasonably practicable, that workers and other persons are not exposed to health and safety risks arising from the business or undertaking.

Officers, such as company directors, have a duty to exercise due diligence to ensure that the business or undertaking complies with the WHS Act and WHS Regulation. This includes taking reasonable steps to ensure that the business or undertaking has and uses appropriate resources and processes to provide and maintain a safe work environment.

Workers have a duty to take reasonable care for their own health and safety and that they do 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.

Consulting workers

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

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.

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

You must consult your workers when proposing any changes to the work that may affect their health and safety.

Consulting, cooperating and coordinating activities with other duty holders

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.

Sometimes you may share responsibility for a health and safety matter with other business operators who are involved in the same activities or who share the same workplace. In these situations, you should exchange information to find out who is doing what and work together in a cooperative and coordinated way so that all risks are eliminated or minimised as far as reasonably practicable.

Further guidance on consultation is available in the *Work health and safety consultation, co-operation and co-ordination Code of Practice*.

1. Managing the risks from rural plant

Farm machinery has the potential to kill and maim. Unfortunately, these injuries are often to somebody's spouse, parent or child. Tragically, the outcome of any on-farm accident has at least two ramifications for families – emotional and financial.

The risks from rural plant, like any other risk, are best controlled using a risk management approach. The object of risk management is to enable you to assess systematically all the factors about an activity involving rural plant. This approach will help you make a judgement about the associated risks and to put in place appropriate controls. The risk management approach involves:

- (a) **identifying** plant hazards that pose a risk
- (b) **assessing** the degree of risk created by the plant, environment and work processes
- (c) **controlling** the risk by implementing the most effective control measure that is reasonably practicable in the circumstances
- (d) **reviewing** the control measure to ensure it is working as planned

It is recommended that the *How to Manage work health and safety risks Code of Practice* be consulted for further information about the risk management process.

Specific information on some of the more common items of rural plant is given in Section 8 Management of other specific plant risks.

2. Identification of the risks from rural plant

Rural plant can come in many different shapes and sizes of machinery, equipment, vehicles and tools. The first step to identifying the risks associated with the rural plant at your workplace or farm is to make a list of all plant. Rural plant includes, but is not limited to:

- planters
- harvesters
- hoppers
- silos
- farm vehicles, e.g. tractors and all terrain vehicles (ATVs)
- electric tools such as saws, drills, grinders
- irrigation equipment
- workshop tools and equipment
- implements.

Once a complete list of plant has been made, all hazards associated with the plant should be noted. A hazard is something with the potential to cause harm, for example the hazards of an electric saw are the saw blade and the electricity itself. Once all hazards at the workplace have been identified the risks associated with the hazards must be determined. Risk is the likelihood that death, injury or illness might result because of the hazard, for example if the blade of the saw is unguarded the likelihood of coming into contact with the blade is high.

Consultation with workers is an effective method of identifying plant and hazards. Often workers have the best idea about where hazards exist because they are the people using the plant on a daily basis.

3. Risk controls for rural plant

3.1 Purpose of control

Controls are those measures that eliminate or reduce the potential for events such as tractor rollovers that can result in injury. When appropriate, the choice of control measures should be made by the producer/grower with the worker or operator.

Controls should be part of any consideration to introduce rural plant into the workplace. You can apply control measures:

- before use, for example when purchasing new rural plant
or
- during use, for example the fitting of a guard to a PTO on an existing tractor.



Figure 1. Tractor being fitted with PTO guard.

3.2 The control hierarchy

The methods of risk control ranked in the order that they should be considered and adopted are:

- (a) elimination – disposing of dangerous, unsuitable or obsolete equipment
- (b) substitution – replacing the material or process associated with plant with a less hazardous one
- (c) engineering controls – redesigning plant or work processes involving plant to reduce or eliminate risk
- (d) isolation – isolating the hazard from people
- (e) administration – adjusting the time or conditions of risk exposure
- (f) personal protective equipment – using appropriately designed and properly fitted equipment where other control measures are not appropriate.

Risks to workplace health and safety should be controlled in order, by elimination, substitution, engineering controls or isolation measures. These control measures reduce or minimise risk in a more reliable manner than administration or personal protective equipment.

Elimination

The use of design as a control by the designer allows hazards to be designed out and control measures to be designed in before manufacture.

Examples of design include:

- a stationary hopper that has been designed with access openings so any necessary cleaning or inspection can be carried out from outside the hopper
- a PTO shaft guard that has been designed to minimise the risk of entanglement
- the design of a guard that has a limit switch positioned so once the guard is lifted or moved slightly, the limit switch is activated and the rural plant stops.

Substitution

Replacing a material or process associated with plant with a less hazardous one should not result in a less efficient method of performing a task or an inferior piece of plant.

Examples of substitution include:

- the replacement of an old tractor without rollover protection with a model that has a factory fitted roll over protective structure
- changing the method of attachment of an implement to the factory fitted drawbar, three-point linkage or other specific hitch points from dangerous points higher than and forward of the drawbar.

Engineering controls

Redesigning equipment or work processes can be used to reduce or eliminate risk.

Examples of engineering controls include:

- redesigning the electrical system to allow for the installation of emergency stop buttons within easy reach of operators of rural plant 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 powerlines if present.

Isolation

Separation of the process can be by distance from the rest of the workplace or by a physical barrier between the process and any person.

Examples of isolation include:

- the use of a tractor cabin designed to isolate the driver from tractor noise
- the use of safeguards that include a guardrail or fence, to isolate other persons such as children or bystanders, from rural plant hazards such as a barrier to a fixed auger intake point
- the use of machine guards on mobile plant e.g. the guards covering rotating parts of a harvesting machine.



Figure 2. Demonstration of guarding as an appropriate method of separating workers from risk.

Administration

If risk remains, it must be minimised by implementing administrative controls, so far as is reasonably practicable. Administrative controls are ‘policy’ or behavioural type controls you can put in place as a producer. These controls can include the time of work, hours of work, who does the work and who has access to a work area or plant. For example, changing a work practice for entry into a confined space, where there is a requirement for an extra person to be present outside the confined space. Administrative controls also include the ‘safe systems of work’ and documented policies and procedures that a business may implement in a workplace.

Examples of administrative controls include:

- training workers in the proper procedures and processes for operating plant
- excluding non-essential personnel from access to plant
- limiting the number of hours in a work period a worker is using rural plant
- ensuring that outdoor tasks are done at the most appropriate time of day to overcome problems associated with ultraviolet exposure, for example skin cancer.



Personal protective equipment (PPE)

Any remaining risk must be minimised with suitable PPE. PPE means clothing, equipment and/or substances which, when worn correctly, protect part or all of the body from risks of injury or disease at work or in the workplace.

Figure 3. Chainsaw operator wearing appropriate PPE.

The control of exposure to plant risks should be secured by one or more measures other than provision of personal protective equipment. Use **of PPE is the least effective method of controlling risk**. However, a long-term strategy using other measures may require the short-term use of personal protective equipment to attain this aim. For example, you may decide to replace noisy rural plant with a quiet version. In the meantime, hearing protection is provided to workers exposed to the noisy rural plant.

3.3 Selecting a control measure

The control of rural plant risks should be dealt with by elimination, substitution, engineering controls and isolation (for example, by a fixed and physical barrier). These controls reduce or minimise risk in a reliable manner. However, the use of PPE, administration and isolation by distance do nothing about the removal of the actual risk.

These controls rely on human behaviour to follow set methods to control the risks. Control measures may be divided into short-term/ immediate control measures and long-term control measures. The overall aim should always be to eliminate the hazard at the source. While trying to achieve this aim other short-term actions should be used.

Some of the methods you can use to select a control measure include:

- consulting with your workers
- referring to suggestions for appropriate control measures in the manufacturer's instructions, where available
- referring to specialist practitioners and representatives of rural industry associations, unions and government bodies.

3.4 Recording control measures

As part of your risk assessment you should record information about implemented control measures. This information should be readily available at the workplace.

3.5 Monitor and review of control measures

You should monitor and review control measures to determine:

- the potential effectiveness of the control measures (i.e. is the risk still reduced by the control measure)
- whether the implementation of a chosen control measure introduced a new hazard
- whether an upgrade to designs of equipment or guards can be purchased to replace old equipment.

One of the ways to undertake this review is to re-do the first two steps of the risk management procedure. This involves identifying the hazards and assessing the risk. Methods that can be used to review control measures to be applied, also include:

- consulting with your workers
- referring to specialist practitioners and representatives of rural industry associations, unions and government bodies.

All control measures should be maintained and monitored. A record of when to conduct a review of implemented control measures should be kept.

4. Producers'/Growers' rights to information

Designers, manufacturers, owners and suppliers of rural plant have duties to ensure rural plant is safe and without risk to health when used properly. These duties relate to the design, construction and testing of plant. In addition, designers, manufacturers, and suppliers have duties to make appropriate information about the safe use of the plant available to others.

This means that when you purchase or hire rural plant for use at a rural workplace, you should receive information about the rural plant from its supplier or manufacturer. The supplier or manufacturer has a legal duty to provide information on the safe use of plant.

This information should include the use for which it has been designed and tested. As well, the information should include any conditions necessary to ensure that, when the rural plant is used properly, it will be without risk to the health and safety of any person. The information should be provided when, for example, a safeguard is purchased separately from rural plant. In this instance, information should include the correct method of attachment or installation of the safeguard.

Also, you have a right to know that:

- the rural plant has been designed, manufactured and constructed to be safe and without risks to health and safety when used properly
- testing and examination has been carried out or arranged to be carried out to ensure that the plant is without risk to health and safety
- the plant, when supplied, is accompanied by information about the way the plant must be used to ensure health and safety.

Further information on the duties of designers, manufacturers, owners and suppliers of plant is in the *Managing risks of plant in the workplace Code of Practice*.

5. Consultation

5.1 Principles of consultation

Workers and other persons should be consulted on rural plant issues that may affect their health or safety. These workers can assist in the identification of the risks involved in operating rural plant at the workplace.

In a small workplace, consultation can take the form of an informal discussion or during the inspection of the workplace. For example, consultation could occur between you and your workers over the content of a manufacturer's instructions. In a large workplace with many workers, you may set up a formal process with a health and safety committee.

Consultation involves the sharing of information and the exchange of views between PCBUs, workers and their representatives. It provides the opportunity to add to the decision-making process in a timely fashion. This may pre-empt or resolve any problems. As well, consultation fosters co-operation in the workplace.

You should ensure consultation with workers occurs during the identification and assessment of risks associated with rural plant for rural workplaces. You should also consult on the selection and implementation of control measures.

5.2 Issues for consideration

The consultative process should regularly address the following issues:

- planning for the introduction of new plant or a new operation method
- identifying risks associated with the operation of plant
- assessing risks associated with the operation of plant
- deciding what control measures can be taken
- determining training requirements
- developing documented 'safe systems of work'
- developing advice to any workers and other persons who are likely to operate plant.
-

6. Preventative measures

There is a range of preventative measures that can assist you to manage the risks associated with rural plant. These are outlined below.

6.1 Inspection

It will be necessary to carry out inspections of rural plant and associated processes as part of risk management and as an ongoing activity. Someone who is competent should undertake inspection of rural plant.

Inspection is one of the best tools available to identify hazards and assess any associated risks before accidents occur. Inspection can accomplish the following:

- (a) identify potential problems of operation not referred to in the manufacturer's instructions
- (b) identify deficiencies in the rural plant or the equipment associated with the use of the plant. Among the basic causes of problems are normal wear and tear, corrosion, and damaged rural plant parts
- (c) identify worker actions associated with the use of rural plant. This will identify where further training is required
- (d) identify effects of changes in processes or materials associated with rural plant. Changes may gradually occur that produce a different outcome than that originally assessed
- (e) identify inadequacies in implemented control measures.

You should consistently identify issues such as:

- (a) the operational standards against which rural plant should be inspected
- (b) the frequency of inspections
- (c) critical safety instructions, such as the isolation procedure, to be applied during inspection
- (d) the procedures to be followed when:
 - i. carrying out periodic inspections
 - ii. carrying out specific tests
 - iii. inspecting repaired rural plant
 - iv. inspecting modified rural plant
 - v. inspecting re-rated rural plant, and

- (e) the procedures to be followed when investigating and reporting to PCBUs any variations from normal operation or dangerous occurrences.

Regular periodic inspections of rural plant should be made.

6.2 Servicing and maintenance

Rural plant should be serviced and maintained in accordance with the manufacturer's specifications or, without such specifications, according to other accepted practice. A record of all servicing and/or maintenance should be kept.

The servicing of rural plant while in use should only be carried out if this can be done without risk to health and safety. Adequate safeguards should be provided to ensure health and safety where servicing is carried out during use.

Through maintenance you can prevent rural plant from deviating from the design intention. This will help prevent rural plant becoming a risk to health and safety. Rural plant should be isolated or de-energised before maintenance starts. When rural plant is isolated and a plant shutdown will result, any total or partial shutdown should not create additional risk.

Where rural plant cannot be isolated, alternate means of preventing accidental operation should be implemented. In these situations, work should be conducted under controlled procedures to allow for maintenance. Examples are:

- a system to control access into maintenance areas
- another person should be stationed at the controls of the rural plant and an effective means of direct communication should exist between the person carrying out maintenance and the person stationed at the controls. Other precautions should be adopted where direct communication is not possible.

All forms of safeguarding should be replaced before start-up of plant. Taking short cuts can lead to exposure to risks.

6.3 Repair

Where possible, rural plant should be isolated before repair begins. Rural plant should be repaired as recommended by the manufacturer or documented procedures.

6.4 Cleaning

Rural plant should be isolated before cleaning starts, and where appropriate, physically made immobile. As well, rural plant should be safeguarded while cleaning, especially where it is necessary to clean rural plant while it is being used. If during cleaning, safeguards have to be removed, then the rural plant should be in a non-operational state or means of preventing accidental operation should be implemented.

6.5 Disengaged/stored rural plant

Rural plant should be disengaged/stored:

- so as not to hinder or interfere with the operation of any other plant
- with safeguards in place if operational, as a precaution against unintentional activation – for example, by a person leaning on the controls
- so access is not obstructed
- to prevent deterioration to the extent that rural plant becomes unsafe.

6.6 Transporting rural plant

When you are transporting rural plant on road/track, you should ensure that rural plant is secured and there is no risk to health and safety. Queensland Transport may have specific requirements which need to be met.

The risk of plant contacting overhead electrical lines should also be considered. The Electrical safety code of practice 2010 - *Working near overhead and underground electric lines* provides practical advice in regards to controlling the risk of electrocution due to contact with overhead powerlines.

A safe system of work for operating rural plant near live electrical lines has been developed by Farmsafe Queensland and is available through your industry organisation.

6.7 Wear, corrosion, and damage

You should consider the risks associated with plant as a result of:

- wear
- corrosion
- loose or worn rural plant parts that overload the design specifications or are not effective
- rural plant parts damaged because of break down, rollover or misuse.

6.8 Modification of plant

Modification to rural plant may include a variety of changes from minor to substantial. A simple modification may not alter the design of rural plant or the way it operates. However, a substantial modification can alter the design characteristics of the original rural plant. This may cause a change in the operation of the plant. For example, a substantial modification may alter the stability of the rural plant or the strength of its supporting parts.

Substantial modifications to rural plant can create risks to health and safety. These risks could affect the operator or any person at risk from the use of the plant. Therefore any modification to rural plant needs careful consideration. A producer who modifies rural plant has the same duty as a manufacturer under the *Work Health and Safety Act 2011* (see section 23 of the WHS Act).

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

- sending rural plant to the manufacturer/supplier for modification
- sending the rural plant to a local engineering workshop
- undertaking the work yourself.

When you undertake substantial modifications, you should take the following action:

- Gather sufficient information, preferably from the manufacturer or a relevant Australian Standard, about the rural plant. This will enable you to include appropriate safety controls when undertaking a modification.
- Undertake an assessment of the modification to ensure the safety control measures mitigate risk. The assessment should use all the information gathered. You should implement further control measures for any risks highlighted in the assessment. The risk assessment should confirm the control of all risks resulting from the modification.

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

Modification of safety equipment 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 its protective ability.

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

7. Guarding

One of the many problems of working with rural plant is the chance of coming into contact with moving parts or materials, getting trapped between moving parts or materials or by being hit by material thrown from the machine. These risks should be controlled by measures that your risk assessment has shown to be appropriate to the task being undertaken.

Generally, guards should be provided where any rural plant part is within reach of persons and could become hazardous during operation, routine maintenance or adjustment. This includes situations where it is necessary to carry out servicing, maintenance or adjustment while:

- the rural plant is operating
- power-driven parts are functioning
- the rural plant is mobile
- power-driven parts are in motion.

Guarding is an important and detailed issue. It is recommended that the *Guide to machinery and equipment safety* be read to properly understand the risks involved and to decide on and implement adequate controls.

8. Management of other specific plant risks

There is a need to assess the operational risks from rural plant in conjunction with other rural plant and the activities undertaken at the workplace. The following subsections identify areas that should be considered in any risk assessment process.

8.1 Tractors

Tractors are an integral item of plant to rural industry. Many fatalities have occurred in recent years associated with the use of tractors, especially in roll over and run over incidents. Workplace Health and Safety Queensland has developed a separate code of practice for tractors titled [The safe design and operation of tractors Code of Practice](#). It is highly recommended that this code of practice be read if a tractor is operated at your workplace. The code of practice outlines information on rollover protective structures and other relevant risk controls.

8.2 Front end loader attachments

Front end loader attachments (FEL) mounted to tractors, 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
- lifting jibs.

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

FELs 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.



Figure 4. Tractor fitted with a FEL, specifically designed for loading/unloading hay bales.

Risk assessment

Before using a tractor and FEL, always do 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 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 axel, wheels and tyres of the tractor to accommodate the weight imposed by the FEL when it is fully loaded
- lift capacity of the tractor's hydraulic system
- is there adequate clearance between tractor front tyres and FEL frame to eliminate contact during turns
- stability of the tractor operating a fully loaded FEL
- appropriateness of the selected FEL to lift the load
- operating conditions related to:
 - (a) density of material to be handled (e.g. nature of material and whether wet or dry)
 - (b) dimensions of the load to be lifted
 - (c) speed of travel which affects stability on bumps or turns
 - (d) load height during travel
 - (e) terrain surface (direction of slope, evenness and hardness of surface)
- whether the Rated Operating Load (ROL) of the FEL will be exceeded.

The ROL is the load that can be safely lifted without reducing rear axel 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 should not be installed on a tractor unless it is fitted with a Roll Over Protective Structure (ROPS) or a cabin incorporating ROPS which complies with *AS 1636 Tractors – Roll-over protective structures – Criteria and tests*. 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 (e.g. bale spike)
- a level lift system
- a rollback guard
- lift 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) that complies with *AS 2294.1: Earth-moving machinery – Protective structures – Part 1: General*.

The FEL should be matched to the tractor. Each FEL 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. The hydraulic system must be able to provide the pressure and flow rate required to lift operating loads of the FEL.

Rear weights or ballast added to tractors fitted with FELs moves 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 recommendations in the Operator's Manual provided by the tractor manufacturer 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.

8.3 ROPS and FOPS for rural mobile plant

The design of the roll over protective structure (ROPS) and/or falling object protective structure (FOPS) on rural mobile plant must be sufficient to provide protection for the operator against roll over and/or falling objects during the task being undertaken.

Roll over protective structure (ROPS)

A roll over protective structure (ROPS) is typically required for a rural mobile plant with a mass of between 560kg and 15,000kg. Where used, ROPS must be manufactured and maintained according to AS1636 (series) *Tractors – Roll-over protective structures – Criteria and tests*, or equivalent. A plate or decal confirming compliance should be attached to the ROPS' frame, or inside the rural mobile plant cabin.

There are numerous situations in which rural mobile plant poses a risk of injury to the operator in the event of a roll-over. All types of rural mobile plant are potentially at risk of roll over, including harvesters, spray rigs and earth moving equipment.

Where there is a risk of injury from a roll-over incident, there are duties under the WHS Act to develop and implement safe systems of work to prevent or minimise the risk of injury to the operator for:

- persons who conduct a business or undertaking
- persons in control of a workplace
- designers, manufacturers and suppliers of rural mobile plant.

A documented risk assessment has to be undertaken in the development and implementation of the safe systems of work. This risk assessment should include information provided from the manufacturer and supplier, but will also need to include aspects regarding the safe use with consideration to specific aspects such as:

1. Operation and environment:
 - (a) the terrain that item of plant may be operated over
 - (b) the speed at which the plant may be operated at
 - (c) any other environmental and operational conditions that may affect the safe use of the plant
 - (d) what weight loading may affect the stability of the item of plant, for example:
 - i. ballast amount and its configuration
 - ii. movement of liquid (e.g. high clearance spray rig)
 - iii. commodity loading (e.g. harvest equipment)
 - (e) stability and operational dynamics e.g. width of track, operation or body height, centre of gravity, distribution of weight.
2. Design:
 - (a) engineering principles and standards adopted to control the risks of injury from roll-over
 - (b) testing or analysis undertaken to determine if the engineering controls provide adequate protection to the operator in the event of a roll-over situation
 - (c) testing or analysis conducted by a suitably competent person or a qualified engineer
 - (d) assessment conducted for operating the item of plant outside design capabilities, if this is likely to occur.

Falling object protective structure (FOPS)

A falling object protective structure (FOPS) must be fitted to any rural mobile plant, if any activity is undertaken which involves a risk to the operator of being struck and injured by a falling object, such as using a dozer for tree clearing or operating rural mobile plant within a eucalypt forest.

8.4 All terrain vehicles

All terrain vehicles (ATVs) are three or four-wheeled agricultural bikes commonly used on farms. Three-wheeled ATVs are inherently unstable and are no longer manufactured. Four-wheeled ATVs are a popular 'workhorse' on the farm. These vehicles are the cause of a number of fatal and non-fatal incidences each year. A large proportion of ATV injuries result from sideways, backward and forward overturns.

Buying an ATV

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

Major considerations include:

- intended use of ATV (e.g. size of property, age of operator)
- terrain and ground conditions
- power and speed
- gear ratio
- suspension
- centre of gravity
- drive mechanism
- available attachments and accessories
- brakes
- seat carrying capacity
- reverse gear.

Risk assessment

When assessing the risks involved with the use of ATVs you should consider the vehicles':

- centre of gravity (usually high)
- track width (usually narrow)
- wheelbase (usually short)
- length of travel suspension (usually long)
- tyre pressure (usually low)
- weight of attachments (e.g. 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 ATV and operator skill.

ATVs also pose an increased risk to the user over and above conventional vehicles. The unique design characteristics of these machines preclude the fitment of protection such as a roll cage. Occupants are therefore exposed to direct contact with the ground in the event of the vehicle overturning.

Risk from the following situations should also be assessed.

- Rider struck by an object (e.g. overhanging branch).
- Rollover from striking an object or the terrain being too steep.
- Leg of rider 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.
- Poor maintenance of brakes and suspension.

Risk control

Personal protection

Protective equipment such as helmets, face shields, goggles, boots or shoes, gloves and appropriate clothing should always 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.

To reduce the risk of ATV accidents, operators should be trained in safe operating practices.

Riders must read and implement the operating instructions of their ATV's manufacturer. Other safe practices include:

- Never allow passengers on the ATV unless it has been specifically designed to carry two persons. Carrying passengers on ATVs which have been designed to carry one person only interferes with the normal dynamics of the vehicle. The added weight also will complicate handling the ATV 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 ATVs directional mass.
 - Never allow anybody to operate an ATV who has not had adequate training or may be under the influence of alcohol or drugs.
 - Keep children away from the ATV and its attachments
- Ensure all guards are in place, particularly foot plates.

8.5 Managing risks from plant with hot or cold parts or material

Hot or cold parts or material associated with rural plant for use at a rural workplace may create a hazard.

Risk assessment

The risk assessment should consider the following:

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

Risk control

Hot or cold material risks from rural plant should be controlled by the elimination of the hazard. Where this is not possible, you should:

- substitute the rural plant with less hazardous plant
- modify the design of the rural plant
- isolate the rural plant, or
- introduce engineering controls such as guarding.

Where these methods are not practicable or do not adequately minimise the risk, then you should use administrative controls and/or personal protective equipment (see Section 3).

8.6 Managing electrical risks associated with plant

The *Electrical Safety Act 2002* places duties on the following persons for electrical safety:

- PCBUs
- persons in control of electrical equipment
- workers where electrical equipment is located.

The *Electrical Safety Regulation 2013* identifies specific precautions to take in relation to specified electrical equipment and working around electrical parts (e.g. overhead power lines) that are applicable to the operation and maintenance of rural plant.

A number of codes of practice also exist that cover electrical risks.

- The *Electrical Safety Code of Practice 2010 – Working Near Overhead and Underground Electric Lines*
- The *Electrical Safety Code of Practice 2010 - Works*
- The *Electrical Safety Code of Practice 2010 – Electrical Equipment Rural Industry*
- The *Electrical Safety Code of Practice 2013 – Managing Electrical Risks in the Workplace*

These documents and other advice produced by the Electrical Safety Office should be consulted to ensure that legal duties in regards to electrical safety are discharged.

8.7 Managing risks from plant designed to lift or move persons, equipment or material

This type of operation usually involves a high level of risk.

Risk assessment

When you assess the risks associated with plant designed to lift or move people, equipment or materials, you should consider:

- 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
- factors affecting stability (e.g. terrain)
- communication systems
- protective equipment and safety gear
- periodic structural checks.

Risk control

When controlling a risk from plant designed to lift or move people, you should ensure that:

- (a) an industrial lift truck (fork-lift) is operated and maintained in accordance with *AS 2359.1 Powered industrial trucks – Part 1: General requirements*, and the manufacturer's instructions
- (b) a crane, hoist or building maintenance unit is operated and maintained in accordance with *AS 2550 Cranes, hoists and winches – Safe use set*, and *AS 1418.1 Cranes, hoists and winches – Part 1: General requirements* and the manufacturer's instructions
- (c) an elevating work platform (EWP) is operated and maintained in accordance with *AS 2550.10 Cranes, hoists and winches – Safe use – Part 10: Mobile elevating work*, and the manufacturer's instructions
- (d) pre-operational and start up checks are performed when operating plant
- (e) a clearly legible notice is fixed in a conspicuous place on the plant or any lifting gear which specifies the appropriate safe working load, in metric units or maximum number of people
- (f) a person at work is not lifted or suspended by any plant or its attachment, other than plant specifically designed for lifting or suspending persons, unless:
 - i. the use of another method of access or movement to the place is impracticable
 - ii. a suitable and adequate personnel box or carrier, designed for that purpose, is used
 - iii. the plant is fitted with a means by which the personnel box or carrier may be safely lowered in the event of an emergency or the failure of the power supply (as approved by an Australian Standard)
 - iv. the plant is suitably stabilised at all times while the personnel box or carrier is in use.

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

- (a) the use of a crane is impracticable
- (b) the load is only travelled with the lifting arm of the plant fully retracted

- (c) stabilisers are provided wherever necessary in order to achieve stability of the plant
- (d) no person is allowed under the hook or suspended load or in the trench adjacent to the plant while it is in operation
- (e) in the case of earth moving machinery, hooks are not used in conjunction with the buckets operated by trip-type catches, unless the catch is positively bolted in the locked position and a warning notice advising of this is provided
- (f) an appropriate load chart is provided
- (g) loads are only lifted using a specifically provided lifting attachment.

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:

- (a) operators are fully trained in safe work procedures
- (b) EWPs are regularly inspected and maintained
- (c) EWPs purchased are designed and manufactured to AS1418 Parts 1 and 10
- (d) EWPs are used in accordance with AS2550 Parts 1 and 10.

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

- (a) ensuring operations are planned and safe e.g. check for soft or uneven ground
- (b) not using an EWP on sloping ground beyond its stated design capability
- (c) keeping safe clearances when working near powerlines, which includes handheld harvesting and pruning equipment
- (d) not exceeding the safe working load (SWL) of the EWP
- (e) ensuring a clean work area around the EWP
- (f) staying within the platform when the EWP is elevated
- (g) using a lookout when the view from the platform is obstructed, and
- (h) undertaking a risk assessment to determine whether the operator should wear a fall arrest system.

The risk assessment for the fall-arrest system should consider:

- (a) height of trees to be harvested or pruned
- (b) EWP stability including ground surface firmness and configuration that may arise from past agricultural practice e.g. tree stump removal, animal activity, melon holes and cultivated or natural slopes
- (c) presence of any ground obstacles that may contribute to injury if a person were to fall or jump from the platform
- (d) likelihood of the need for a rapid exit or descent because of swarming or biting insects
- (e) any other site-specific risks identified.

8.8 Managing risks of confined spaces

A 'confined space' means an enclosed or partially enclosed space that:

- (a) is not designed or intended primarily to be occupied by a person; and
- (b) is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space
- (c) is or is likely to be a risk to health and safety from –
 - i. an atmosphere that does not have a safe oxygen level;
 - or
 - ii. contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion;
 - or
 - iii. harmful concentrations of any airborne contaminants;
 - or
 - iv. engulfment;

but does not include a mine shaft or the workings of a mine.

Examples of confined spaces include:

- (a) storage tanks, process vessels, pressure vessels, boilers, silos, field bins and other tank-like compartments
- (b) pits and degreasers
- (c) pipes, sewers, sewer pump stations including wet and dry wells, shafts, and ducts
- (d) effluent pits and wells
- (e) silage pits.

However, many other types of structures may also meet the definition of a confined space. A person whose upper body or head is within a confined space is considered to have entered the confined space.

Risk assessment

Fatalities or severe injuries may occur as a result of the following:

- (a) oxygen deficiency in the confined space which may be caused by:
 - i. slow oxidation reactions of either organic or inorganic substances
 - ii. rapid oxidation (combustion)
 - iii. the dilution of air with an inert gas
 - iv. absorption by grains, chemicals or soils
 - v. physical activity
 - vi. chemicals, including fumigant residue such as phosphine.
- (b) oxygen excess in the confined space which may be caused by a leaking oxygen supply fitting such as in gas cutting or heating equipment
- (c) the presence of contaminants on surfaces or in the atmosphere. Contaminants may be in the form of solids, liquids, sludges, gases, vapours, fumes or particulates. The sources of atmospheric contaminants encountered may result from:
 - i. the manufacturing process
 - ii. the substance stored or its by-products – for example, disturbing decomposed organic material in a tank can liberate toxic substances such as hydrogen sulphide
 - iii. biological hazards such as bacteria, viruses or fungi may also be present
 - iv. the operation performed in the confined space – for example, painting with coatings containing toxic or flammable substances, and welding or brazing with metals capable of producing toxic fumes.
- (d) operation of moving equipment – for example, being trapped by augers, crushed by rotating parts such as conveyor belts or accidental operation of equipment such as sweep augers (thereby causing suffocation)
- (e) uncontrolled introduction of steam, water or other gas or liquid
- (f) suffocation by solids – for example, grain, sand, flour or fertiliser
- (g) electrocution
- (h) explosion or fire.

Undertaking work in confined spaces may greatly increase the risk of injury from hazards, such as:

- (a) noise which may be caused by hammering or the use of equipment within the confined space
- (b) temperature (either high or low) which can result from the work process or the weather conditions, or where appropriate ventilation or appropriate clothing is not supplied or worn
- (c) manual tasks
- (d) falls, trips and slips.

Confined spaces requirements exist under the WHS Regulation. For this reason, when carrying out an assessment of the risks associated with a confined space you must consider:

- (a) all proposed operations and work procedures, particularly those that may cause a change in the conditions in the confined space
- (b) the soundness and security of the overall structure and the need for illumination and visibility
- (c) the identity and nature of the substances last contained in the confined space
- (d) the steps needed to bring the confined space to atmospheric pressure
- (e) all hazards which may be encountered – for example, entrapment
- (f) the status of fitness and training of persons involved in confined space work
- (g) adequate instruction of those persons in any work procedure required, particularly those which are unusual or non-typical, including the use and limitations of any personal protective equipment and mechanical or other equipment to be used
- (h) the availability and adequacy of appropriate personal protective equipment, protective clothing and rescue equipment for all persons likely to enter the confined space
- (i) whether signs comply with *AS 1319- Safety signs for the occupational environment*, and indicate that entry is permitted only after signing the entry permit in a manner appropriate to the persons at the workplace
- (j) the need for additional protective measures, for example:
 - i. prohibition of hot work in adjacent areas
 - ii. prohibition of smoking and naked flames within the confined space and, where appropriate, the adjacent areas
 - iii. avoidance of contamination of breathing atmosphere from operations or sources outside the confined space, such as from the exhaust of an internal combustion engine
 - iv. prohibition of movement of equipment such as fork-lifts in adjacent areas
 - v. prohibition of spark generating equipment, clothing and footwear
- (k) whether cleaning in the confined space is necessary
- (l) whether hot work, such as welding, heating or cutting is necessary.

Risk control

Confined spaces regulations require that when controlling the risks associated with confined spaces, you must ensure:

- (a) atmospheric monitoring is conducted prior to and during the entry to the confined space
- (b) a stand-by person is present outside the confined space and is able to communicate with those inside the confined space
- (c) appropriate signs and protective barriers are erected to prevent entry of persons not involved in the work
- (d) the provision of suitable equipment for workers entering confined spaces should include, where necessary, the following:
 - i. personal protective equipment
 - ii. rescue equipment
 - iii. first-aid equipment, and
 - iv. fire suppression equipment.
- (e) suitable supplied-air respiratory protective device is worn where:
 - i. the results of the assessment or monitoring indicate that a safe atmosphere cannot be established or may not be maintained, or
 - ii. the nature of the work procedure within the confined space is likely to degrade or contaminate the atmosphere in the confined space, for example hot work, painting or removal of sludge.
- (f) suitable safety harnesses and safety lines or rescue lines are worn where:
 - i. there is a hazard of falling during ascent or descent,
or
 - ii. rescue by a direct route, either vertical or horizontal is practicable.
- (g) precautions are taken to eliminate all sources of ignition where a flammable atmosphere is likely to exist

- (h) no cylinder of compressed gas, other than those for self-contained breathing apparatus, is taken into the confined space
- (i) any portable ladder used is firmly secured to prevent movement.

8.9 Managing risks from working at heights

The WHS Regulation has provisions about managing the risks of a fall. These must be followed in relation to any work at height.

Risk assessment

Falls from height can occur when repairing, maintaining or just gaining access to plant and buildings at the workplace. Silos, windmills, towers, sheds/barns, mezzanine floors and other structures can all be a hazard to PCBUs, workers and others, if work is being performed at a height where a fall may result in injury or death.

Some of the hazards that should be assessed for risk are:

- height of work
- ground hazards (e.g. rocks)
- lack of guard rails or other edge protection
- pitch of roof
- surface material and condition (e.g. brittle asbestos-cement sheeting)
- weather conditions (e.g. high wind)
- complexity of task (e.g. use of power tools).

Risk control

PCBUs and other duty holders should ensure that each hazard that may result in a fall or cause death or injury if the person were to fall, is identified, assessed, and controlled.

To prevent the person falling, the following controls should be considered:

- edge protection
- a fall protection cover placed over an opening
- a travel restraint system.

If prevention is not practicable a worker's fall should be arrested by a method that does not pose any risk of injury or death when the fall is arrested. Examples of control measures to arrest a person's fall are:

- a fall-arrest harness system
- an industrial safety net.

Ladders

When using a ladder at a height where a fall may result in injury or death, the person using the ladder should have at least two hands and one foot, or two feet and one hand, on the ladder. The type of work that can be safely performed on a ladder is limited. Other methods of access such as scaffolding or an elevating work platform should be considered for involved tasks.

9. Training

The purpose of training is to ensure that people in rural workplaces have the appropriate skills and knowledge to operate and maintain plant in a manner that is safe and without risk to health. Provision of training to staff is an essential step towards meeting your duties under the WHS Act.

9.1 Provision of training

You must ensure that any person (including yourself) who operates and/or maintains rural plant in a rural workplace receives training that enables them to operate and maintain rural plant safely. This includes:

- any person who operates, inspects or maintains plant
- workers who train others to use, inspect, audit or maintain plant
- people required to work in and around, or in close proximity to, rural plant.

Training may be carried out by:

- you
- a person you may engage from outside the workplace
- a registered training provider (e.g. Farmsafe Queensland, TAFE Queensland).

In addition, High Risk Work licences are required for operation of certain items of plant, such as mobile cranes, forklifts and some elevated work platforms etc.

9.2 Training methods

Training should be appropriate to the plant to be operated and the type of work to be performed. In some cases, formal training will be appropriate, in others, on-the-job training may be more appropriate. For example, training for a worker on how to safely connect a slasher to the Power Take Off (PTO) on a tractor would be more appropriately performed through practical on-the-job training.

The special needs of workers should be taken into account in deciding on the structure, content and delivery of training. This should include literacy levels, work experience and specific skills required for the job.

If the literacy level is low, then spoken methods or highly graphic visual methods should be used. If a worker does not understand or speak English well enough to comprehend and gain competence through the proposed training method, training should be provided in a suitable language and method to suit the trainee.

Training should be practical and include a hands-on component where this is relevant. For example, training a worker on the use and fitting of personal hearing protectors where the employee's work involves the use of noisy rural plant.

9.3 Elements of a training program

The training program should cover:

- how to use and maintain rural plant
- any specific conditions and prohibitions on the use of plant
- any known residual risks, for example, those that cannot be eliminated or sufficiently reduced by design and against which guarding is not totally effective
- the control measures that should be used to reduce the risks associated with plant and the correct use of the controls, for example guards
- how to access the information on plant for a rural workplace, for example manufacturer's instructions
- instruction in the appropriate work method including the correct use of personal protective equipment (PPE)
- any inspection and maintenance program in place at the workplace
- any requirement for special tools that will be used in the use or maintenance of rural plant.

A training program should also cover legislative requirements, such as:

- duties under the WHS Act
- relevant codes of practice.

The amount of detail required and extent of a training program will depend on:

- the hazards associated with the rural plant
- the degree of risk
- the complexity of the work procedures
- any controls, work practices and PPE required to minimise risks.

The training program should be developed following an assessment of likely risks. The development of all training programs should be in consultation with your workers and their representatives.

9.4 Assessment of competency

PCBUs should determine a worker's competency to operate an item of plant. This can be achieved by having the worker operate the plant under supervision and assessing the operator for knowledge and skill. This can be accomplished by setting and observing a specific task which can be assessed in conjunction with the demonstration of knowledge through answering questions about the plant, (e.g. safe working load).

9.5 Review of training

You should review the training program, including induction and refresher courses, at least once a year or:

- each time there is a change in:
 - (a) plant for rural workplaces
 - (b) any hazard information from the manufacturer
 - (c) a work practice
 - (d) a control measure.
- each time a worker is assigned to:
 - (a) a new task not previously carried out
 - (b) a work area for which the worker has not received training.

9.6 Training records

A training record is proof that you have satisfied your duties under the WHS Act to provide training. Training records provide an accurate statement of the training that each person has received at any particular time.

The training program record should include:

- the names of persons receiving training and date of attendance at any training program
- an outline of the course content
- the names of any person providing the training
- where applicable, a person's accreditation certificate number.

Appendix: Dictionary

'appropriate information' – information which states:

- (a) the use for which the plant has been designed and tested
- (b) the conditions (if any) that must be followed if the plant is to be used safely and without risk to health.

'grower' – a person conducting a business or undertaking in the rural industry, whether as a PCBU or otherwise.

'producer' – a persons conducting a business or undertaking in the rural industry, whether as a PCBU or otherwise.

'rural industry' – an industry in which persons are engaged primarily in work:

- (a) in the cultivation of any agricultural crop or product whether grown for food or not
- (b) in the rearing and management of livestock
- (c) in the classing, scouring, sorting, or pressing of wool
- (d) aquiculture
- (e) in flower or vegetable market gardens
- (f) at clearing, fencing, trenching, draining or otherwise preparing land for any purpose stated in paragraphs (a), (b) and (d) to (f).

'rural plant' – includes the following when used for the performance of work at a rural workplace:

- (a) a machine or on-farm vehicle. For example, a tractor
- (b) any tool, equipment or apparatus powered by an energy source or manually operated. For example, a manually or mechanically powered auger
- (c) any component and anything fitted or connected to the items of rural plant specified in (a) and (b). For example, a guard on a bench saw.

The term rural plant includes, but is not restricted to: tractors, augers, harvesting machines, slashers, cultivators, balers, power tools, brush cutters, pickers, posthole diggers, plant fitted with power take offs or implement power input connections

'rural workplace' – a workplace in rural industry