

Safe practice for forestry and harvesting operations Parts C and rest of E

For reviewers:
We are updating the forestry guidance suite.
This suite will be developed in the following Parts:
Part A: Managing health and safety through the contracting chain (sent out for feedback mid-November)
Part B: Managing Health (sent out for feedback mid-November)
Part C: Roading, access and site planning (this document)
Part D: Establishment and Silviculture (draft will be sent out later in December)
Part E: Harvesting
- Mechanised harvesting and tree felling (sent out for feedback mid-November)
- Steep slope harvesting (sent out for feedback mid-November)
- Cable logging (this document)
- Manual felling (sent out for feedback mid-November)
- Breaking out (this document)
- Using mobile plant (this document)
Part F: Work on landings, loading and unloading (draft will be sent out later by 16 December)
Part G: Worker facilities, first aid, emergency plans, PPE, training, information, instruction and supervision (sent out for feedback late November)

What things mean: terms used in this guidance

In this guidance, where we use the term 'you' it is referring to you as a PCBU.

Use of 'must' and 'should'

In these guidelines you will see the words 'must' and 'should'.

They are used very deliberately.

Where you see the word 'must' it means that it is a legal requirement. You have to comply.

Where you see the word 'should' it means that it is a recommended practice or approach but it is not mandatory.

The use of 'should' means that you can look at approaches that are different than recommended good practice and which may in the future be accepted as good practice. It does not allow for approaches that are less robust or provide a lesser level of safety.

Use of 'so far as is reasonably practicable'

You will also see the phrase, 'so far as is reasonably practicable' where certain legal requirements require you to do something.

'Reasonably practicable' is the term used to describe what is reasonably able to be done in your circumstances when deciding how to meet health and safety duties, taking into account:

- the amount of harm that might result from the hazard or risk,
- the likelihood of it happening,
- what the people involved can be expected to know about the hazard or risk and ways they can eliminate or minimise it, and
- are those ways available and suitable?

Then – and only then – can you consider the cost of eliminating or minimising the risk and whether the cost is grossly disproportionate to the risk.

For more information, see WorkSafe's guidance: Reasonably practicable

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Part C: Roading, access and site planning

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(Note - based on certain content from Safe Work Australia's guidance Forestry: Guide to managing risks of coupe and harvesting site access and preparation.

1.0 Introduction

1.1 What does this section cover?

This guidance looks at how to manage the risks around roading, construction and access in forestry and harvesting operations.

There are sections on:

- constructing access roads
- maintaining access roads
- constructing bridges
- constructing log landing and loading areas
- safety signs
- controlling authorised visitors.

A PCBU who manages or controls a workplace must ensure that, so far as is reasonably practicable, the workplace, the means of entering and exiting the workplace, and anything else arising from the workplace are without health and safety risks to any person.

You do not owe this duty to anyone who is at the workplace for an unlawful purpose.

For information on the duties of PCBUs that work together, see Section x.

1.2 What are the common risks faced by workers using access roads and landing sites?

Some of the risks when constructing or using access roads and landing sites include:

- machinery slipping down moderate to steep slopes during road construction
- poorly constructed roads failing and becoming dangerous for people to drive on
- poorly constructed landings causing congestion and making it difficult for vehicles and machinery to work safely around other machines and pedestrians
- poorly constructed earthworks leading to sediment and debris flows and build up. This could lead to landslides, especially during heavy rain.

2.0 Site access and preparation

2.1 Constructing access roads to harvesting sites, log landings or processing areas

Construct and maintain road to the engineering standards appropriate for the intended use.

Refer to the New Zealand Forest Engineering Manual, available from the NZ Forest Owners Association.

When constructing access roads to logging areas:

- check the initial road construction plan and remove hazards from road, bridge and log landing construction areas
- if the construction area is adjacent to a moderate-steep slope, put in place control measures to prevent machinery slipping down that slope
- remove hazardous trees within two tree lengths of the construction area
- make sure felled trees are clear of standing trees and left in a safe position
- mark or tape dangerous areas or trees, including trees with hang ups
- use safe systems of work which allow road users and adjoining landowners to pass safely through and around the road works.

2.2 Maintaining access roads

Unsealed access roads can deteriorate and put workers and other road users at risk.

Maintain roads to ensure a reasonable quality road surface.

Put in place traffic control measures as needed during maintenance.

2.3 Constructing bridges

When constructing bridges, check:

- the machinery being used can handle materials used in bridge work
- bridges will be able to carry intended loads
- a safe working area is provided to process the materials used in bridge construction
- flotation devices are worn by workers working over water
 - no person is in the slew area of materials handling equipment and overhead movement of materials
- no person is lifted or suspended from machinery unless in an approved work box.

Design and construct bridges and their approaches to engineering standards appropriate for the intended use.

2.4 Constructing log landings or log loading areas

Design and prepare log landing or loading areas to allow safe operations. This can be done by minimising the risk from surrounding trees and minimising when workers and machinery interact. When designing safe areas, consider:

- is the area as flat as possible and allows for water run-off?
- are there overhead electric lines?
- are hazardous trees to be felled within two tree lengths of the landing?
- is there enough space for parking, turning and moving mobile plant and trucks, and for truck entry and exit?
- can traffic pass the operation safely?
- has a safe place been identified and set aside for truck drivers during loading operations?
- is there a place for a rest area and a place to park vehicles?
- are pedestrian accesses safe?
- are there separation distances between major activities like loading, stacking and measuring?
- is there space:
 - set aside for inspecting and maintaining machines
 - for the number of products to be stored, loaded and for the volume of wood to be handled
 - for storing hazardous chemicals like fuel?

2.5 Safety signs

Safety signs should be clear and readable.

They should:

- give people approaching the workplace warning of the forestry operations
- state that unauthorised people must not enter the workplace
- give authorised people directions to a location (and if necessary, contact details) for the people in the crew (for example, the harvesting team leader)
- tell authorised people (including visitors) about:
 - the PPE that should be used
 - how to communicate with the harvesting crew.

Signs should also be posted at areas of intense forestry activity:

- at the entrances of each work area
- in prominent places at frequently used entry points.

Signs should read "Danger – Tree Felling Ahead" or "Tree Felling in Operation" and "No entry – authorised personnel only" (Figure 1).



Figure 1: Examples of signs for tree felling operations (placeholder)

Other signs which provide useful information include those for:

- road closures
- traffic control
- truck entry and exit
- RT and other communications being used in the work area.

2.6 Controlling authorised visitors

Put in place arrangements to manage visitors to the work area including providing a site induction.

The site supervisor is responsible for ensuring visitors:

- understand and comply with safe work procedures
- use PPE where it is required.

Part E: Harvesting – cable logging, breaking out and mobile plant

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3.0 Managing the risks – cable logging

The forestry industry has produced detailed guidance on cable logging and its procedures. For more information, go to (insert link)

3.1 What is cable logging or cable harvesting?

Cable logging is a method of moving logs from a felling site to a landing area. It uses a stationary machine with powered drums, spars or towers, blocks, wire ropes and butt rigging. Harvested logs may be fully or partly suspended for all or part of the yarding distance.

Cable logging is mainly used to harvest timber from steep slopes where conventional retrieval methods are unsuitable due to the risk of mobile plant rolling over. It can also be used in broken terrain, where the ground is wet or soft, or where logs need to be lifted over environmentally sensitive areas.

There are many different types of cable logging machines and rigging systems. To find out more about the different systems and the specifics of their rigging, industry guidance will have more information.

3.2 General safety principles

Cable logging has specific risks including:

- being hit by logs or other objects on the landing
- being hit by rolling logs while working on steep slopes below the landing
- being struck by equipment which fails and injuries caused by wire rope sprags.

To protect workers from cable logging hazards, these are the basic things you should do:

- Stop operating if cable logging become dangerous because of bad weather conditions such as high wind or poor visibility.
- Keep everyone in a safe area away from moving lines, rigging, loads or standing skylines until the rigging or loads have completely stopped.
- Keep everyone outside the bight of tensioned running lines at all times.
 - Run lines in a straight line and ensure they are not obstructed.
 - Make sure tree-felling activities are at least two dominant tree lengths ahead of active yarding lines and breaker-out workers.

3.3 Safe operator

This section deals with the workers who operate the yarders and work on the landings. The skills, training and requirements of the breakers-out are covered separately in the section 'Managing the risks of breaking out'. (link to come)

Cable logging is a hazardous extraction method that requires concentration and awareness. Yarder operators need to be physically fit, alert and mentally capable if they are to do their job safely.

If you are an operator, you should make sure that you:

- get good sleep
- keep physically fit
- take good rest breaks
- drink lots of fluids and eat well
- do not let drugs or alcohol impair your judgement.

Making sure workers have the right training and supervision

Operating a cable logger is a skilled job. As a PCBU, you must ensure, so far as is reasonably practicable, all operators have adequate knowledge and experience and are adequately trained in the safe operation of their machine.

If operators are still gaining experience, they must be adequately supervised by a competent person.

No worker should be allowed to operate a machine unsupervised until they have demonstrated their competence.

The requirements for training, instruction, information and supervision are explained in Part G.

Making sure workers are involved in managing risks

You must engage with workers when identifying hazards, assessing risks, and deciding what control measures to use to eliminate or minimise those risks. It is good practice for all hazards/risks and control measures to be documented and accessible to workers.

All operators should know and understand the hazards/risks they will face while on the job and the control measures to manage those risks.

Before starting any new block, involve all crew members in identifying significant hazards/risks on the ground and in the operational process. They should know what the control measures are for those risks and how to apply them.

For each working day, all operators should be involved in daily tailgate meetings and daily work planning.

All operators should know who is on site or might be coming on site.

Managing health risks

Operators should also be aware of health hazards that can arise from operating their machines.

Part B explains common health risks that workers may face.

However, there are three health hazards that are common among machine operators that are highlighted below: work-related musculoskeletal disorders (you probably know them as OOS or RSI), dehydration and fatigue.

Work-related musculoskeletal disorders (WRMD)

These are the strains, sprains, aches and discomfort that you can get in your muscles or joints when working continuously and often with repetitive movement. Basically, your muscles become fatigued.

The most common WRMD injuries in machine operators occur in the wrists, hands, shoulders, neck and back.

Many machines have their cab layout and fittings designed to help minimise the risk of injury with ergonomic joystick controls and seats. But the operator is still in the cab for what can be many hours.

Although sitting still, operators still use many muscles to brace and counter the movement of the machine. This is where musculoskeletal problems can arise.

To manage the risk of these problems, you should make sure:

- all machines, so far as is reasonably practicable, have ergonomically designed control measures and seating to minimise risk to the operator
- seating and controls are adjusted for each operator before they start work in the machine
- operators rest muscles frequently with micro-pauses while working the machine
- operators take regular breaks and stretch their muscles and joints outside of the machine.

For more information on musculoskeletal disorders, see Section 19.

Dehydration

Dehydration occurs by either not drinking enough fluid or by drinking the wrong types of fluid.

When it happens, it can cause premature fatigue and difficulty in concentrating. Operating a machine requires a lot of concentration and it is important that machine operators drink regularly and drink well during the day.

If you are a machine operator it is recommended that you:

- carry enough drink in the cab to drink regularly throughout the day
- drink enough that you have to urinate regularly during the workday
- avoid drinking energy drinks or soft drinks and cordials during the workday
- save drinking energy drinks, soft drinks etc until after work to replace energy
- drink plenty of water at night to recharge the body for the next day
- make sure the air conditioning (if it is fitted) in the cab is working effectively. (If it is not working, let the foreman know so it can be fixed.)

Fatigue

Cable logging is a demanding job that requires constant alertness and attention. Fatigue is common risk which should be planned for. A fatigue management plan helps the operator manage their work health. It does help if operators eat and drink well (see above), have a good night's sleep, and take work breaks.

The following actions could be used in a fatigue management plan: Build in a minimum 15-minute break every 3 hours, or two 30-minute breaks per day.

- Take micro breaks. A break of 5 minutes per hour can make a big difference.
- Limit work hours. Industry recommends no more than:
 - 13 hours per day, including travel but not counting rest breaks
 - 65 hours in seven days, including travel time
 - 6 successive days.
- Keep a log of hours worked.
- Take breaks and stop operating if operators have lost concentration.
- Do not allow operators to operate the machine if fatigued.
- Do not do unsafe work, and do not let production pressure affect decisions.

For more information on managing fatigue, see Section 10

Personal protective equipment (PPE)

All machine operators must wear the appropriate PPE.

The PPE for machine operators should include:

- high-vis shirt, vest or jacket with night glow for increased visibility
- high-vis helmet, particularly when working outside a protected cab
- hearing protection
- safety footwear
- other useful equipment can include:
 - gloves for handling wire rope and rigging. Heavy cotton gloves are preferred because any puncture wounds are less severe
 - protective eyewear
 - small personal first aid kit.

For specific requirements for providing PPE, see Part G.

Communications

Effective communication between members of the crew during cable logging is critical.

Crew members may communicate using:

- audible signals (tooter signals)
- radio communication
- hand signals
- direct communication.

The preferred method of communication is radio communication as it is the one system that allows immediate two-way communication.

All crew members working on or with a cable logger should have radio communication.

Audible (tooter) signals must be clearly heard by all workers in the vicinity of a rope that is about to be hauled.

Stop all hauling if communication becomes inaudible or not clearly understood. Do not restart until communications are fully restored.

Test radios and tooters daily, before work commences.

Signals - tooter and hand signals - must be understood by all the crew.

3.4 Safe yarder

General safety principles for yarders

Take the following actions to make sure your yarder is operated safely:

- Securely and safely anchor all yarders before yarding operations start.
- Put the yarder on solid level ground and protect from pooling rainwater. Outriggers and levelling pads should have a stable base.
- Make sure guylines used to stabilise the yarder are at least the size, strength and number recommended by the machine manufacturer. Place guylines so they oppose the pull of the yarding lines.
- All yarders should have certified falling object protective structures (FOPS) and operator protective structures (OPS) on their cabs. An exception can be made where cable yarders are remotely operated, and the operator is not located on the yarder.
- Securely fence or totally enclose transmission, machinery and hazardous moving parts on yarders in accordance with current industry standards.
- Maintain control levers, pedals, brakes and other equipment on yarders so they are in safe working order.
- Have non-slip pad surfaces on foot-operated mechanisms like brakes.
- Securely fix ropes to the winch drum. Ropes should be long enough to ensure that there is four or more complete wraps of rope on the drum in every working position.
 - Use a guide pulley, tool, iron bar or other mechanical or manual means to guide ropes onto drums. No one should guide ropes onto drums with any part of their body in direct contact with the rope.
 - Do not operate or move yarders until everyone is in a safe area.
 - When moving a yarder with an integral tower, lower or support the tower according to the manufacturer's guidelines so the machine remains stable.

Certification and inspection

All towers need to be properly certified and inspected to maintain their safety. You will need to:

- Permanently attach an identification plate to each yarder tower's base with the following information:
 - name and address of the manufacturer and the yarder model number

- maximum breaking strength and size of the mainline for which the tower is designed
- maximum breaking strength and size of tail rope (haulback) for which the tower is designed
- maximum and minimum inclination at which the tower is designed to be operated
- number, breaking strength and size of guylines needed
- maximum breaking strength and size of skyline, mainline and tail rope which can be used on a tower designed for a skyline or slackline system.
- Make sure all yarders and yarder towers are inspected annually by a competent person and tagged as certified. The information on the plate should include:
 - the owner of the plant
 - make, model and serial number
 - inspection expiry
 - certifier number.
- Make sure the yarder is reinspected if there is a tower tip-over or if a part is damaged, or damage is suspected. Do not operate the yarder until this inspection is done.
- Make sure the yarder is inspected each time the tower is lowered to the ground or if there is any doubt about whether the tower is safe.
- Only make structural changes to towers under the direction of the manufacturer, a certified professional engineer or equivalent person competent in this field. The overall safety factor of the equipment should never be reduced when modifying towers.

Checks

Consider the following:

- Rig all cable logging installations in accordance with the manufacturer's specifications or industry-specified requirements, whichever is the higher standard.
- Make sure the yarder is inspected regularly so that it remains stable.
 - Make sure yarders are checked daily by a competent person to make sure the guyline anchors and rigging are secure when under load.
 - Make sure guyline anchors and rigging are inspected when the working ropes have been subjected to any shock loading or failure. Do not operate the yarder until this inspection is done.
- Document guyline anchor and rigging checks. Documentation may include photographic evidence with a date and time stamp. Securely store electronic files and ensure they can be viewed on request.

3.5 Safe site

Log landings

There are many factors that can affect the size and shape of log landings, including the:

- size and type of yarder

- loader configuration
- log size and length
- volume of logs to be yarded
- space available.

Landings that are too small or poorly laid-out can result in people and machines getting in the way of each other. There can cause an increase in the hazards/risks for people working on the landing.

These risks need to be managed. The best way to so this is by making sure that the landing is a good size and well laid-out.

The size, location and layout of landings should be considered in the early harvest plan. All PCBUs (and their workers) should work together to figure out the most effective and safest sites and harvest systems.

Landing areas should:

- be large enough to allow:
 - safe entry and exit by all truck types
 - separate working areas for each landing activity
 - spaces for storing logs and logging slash
 - machinery to move about safely
 - logs to be heeled and swung without hitting standing timber, rigging or other equipment or objects
- have good space for parking vehicles safely away from landing activities
- have good space for storage and smoko and rest areas
- be large and level enough to land and deck logs so they will not slide or roll towards workers or equipment
- have a solid and flat foundation with good water drainage
- have no hazardous trees within reach of the landing and the planned guyline placement
- have no trees in the corridor of the guyline to ensure no deviation of the tightened guyline
- have clearly identified designated safe areas.

An example of how a landing can be laid out is in Figure (2) below.



Figure 2: Landing design (placeholder)

For downhill yarding, make sure landings are large enough to have sufficient space between the base of the slope and the tower to allow for safe landing of logs without endangering the yarder (Figure 3).



Figure 3: Landing design for downhill yarding (placeholder)

Ropes across the road

Clearly flag or mark any static ropes rigged across any road for road users.

Install signposts to warn of clearance restrictions where any overhead ropes are less than six metres (6 metres) above the road surface when slack.

Put traffic control measures in place if any of the ropes rigged across the road are operating ropes. Do not allow vehicles under operating ropes when the ropes are in use.

Staying safe on the landing

Coming on to the landing

Every person entering an operational area should:

- notify the supervisor or foreman before entering the operational area
- only enter the operational area when they have been acknowledged or signalled that it is okay to enter
- take care when approaching workers engaged in any operation
- be aware that workers wearing hearing protection may not hear them
- wear appropriate personal protective equipment (see PPE for more information link to come).

When on the landing

Make sure workers stay clear of:

- all working machinery
- swinging or suspended logs or stems
- trucks and trailers being loaded or unloaded (see also 'Work on Landings' link to come).

Before moving into another work area, ensure the affected machine operators are signalled, and that permission is signalled back.

The poleman

The poleman works on the cable logging landing site. They unhook landed stems and monitor the condition of the carriage, ropes, rigging and strops during unhooking.

Make sure the poleman has a designated safe area and remains in this area whenever working ropes are operating.

- Make sure all ropes are stopped and locked before the yarder operator signals the poleman that it is safe to unhook. The yarder operator should make sure that all rope movement remains stopped until the poleman is back in the designated safe area.
- Before unhooking starts, the poleman and yarder operator should make sure that the drag/stems are stable and not likely to shift.
- Do not allow workers to work under a suspended stem or log or go in to unhook stems/logs before the drag is landed.
- Do not allow workers to stand more than one metre off the ground when unhooking stems or logs.

- Make sure all rope movements are signalled.

3.6 Safe rigging, anchors and skylines Guylines

When setting up guylines, consider the following:

- Position and use the guylines used with yarding equipment according to the plant manufacturer's specifications.
- Make sure the number of guylines attached to integral steel towers are at least the minimum recommended by the equipment manufacturer.
- Do not splice guylines together. When they are connected to extensions or anchors, it should be with one of the following:
 - spliced or swaged eyes with shackle connectors with all splices tucked at least three times on each side
 - white metal babbitted or swaged ferrules with double-ended chokers between extension.
- Make sure guyline connections have at least 1.5 times the breaking strength of the guylines themselves.
- Make sure load bearing guyline angles are 45 degrees or less when measured vertically. If suitable anchors are unavailable, or the terrain is so steep that the guyline angle exceeds 45 degrees, rig an extra guyline to oppose the load.
- Make sure guylines are securely tightened while the tower is in use and adjusted to share the load as equally as possible.

Anchors

Securely anchor all skylines, guylines and tailrope blocks to one of the following:

- suitable-sized stumps or combinations of stumps capable of resisting the forces applied to the stump, for example:



Figure 4: Suitable stumps or combinations of stumps (placeholders)

- deadman anchors of sufficient size and buried to an adequate depth, for example:



- suitable mobile plant anchors that are of sufficient size and correctly braced, for example:



Figure 6: An excavator used as a tailhold or guyline hold, and a bulldozer used as an anchor point (placeholders)

- correctly installed artificial anchors providing sufficient strength, for example:



Figure 7: Tipping plates require multiple anchors for each guyline (placeholder)

- Make sure the guyline anchor locations meet the manufacturer's specifications for yarder set-up.

- Make sure that no worker goes within 6 metres of a live anchor once an anchor is rigged.
- Do not use standing trees as anchor points in any part of a cable-harvesting operation.

Selecting stump anchors

A stump anchor is the stump of a felled tree which has been selected as suitable to use as an anchor.

They may be used for:

- hauler guylines
- skyline anchors
- tailspar and intermediate support guylines
- block anchors
- anchoring other machines and equipment.

It is hard to predict what holding power a stump has, but these general guidelines apply.

What to look for in a 'good' stump

Pick a stump that:

- is freshly cut (less than 6 months old)
- is in deep and firm soils
- has a sufficient height of solid wood above the planned notch (for example, at least 30 cm)
- has a larger diameter stump (for example, a 60-cm-diameter stump may hold approximately four times as much as a 30 cm stump).

What to avoid in a stump

Avoid stumps that:

have been damaged or disturbed during road or landing construction

- are in wet swampy areas. Stump (and soil) strength decreases as a soil gets wetter
- are located in shallow, loose, or friable soil. In particular, where there is only a thin soil overlying rock
- have started to rot. The root systems in stumps over 6 months old have started to rot and their strength may have reduced
- have been previously used as anchors. These may be in a weakened state despite looking sound
- come from wind-damaged or heavily leaning trees
- have been cut too low to allow adequate holding wood above the attachment point.
- have been partially pulled out of the slope.

Notching a stump

When notching the stump:

- notch all stump anchors to make sure the rope is held around the anchor
- make sure notches are cut to a suitable depth and shape (for example, 2x the rope diameter in width and 1.5x the rope diameter in depth)
- make sure the notch is as close to the ground as possible- do not cut off the roots
- make sure there is at least 30cm of solid wood above the notch
- make sure the notch is cut on the same angle as the guyline under tension.



Figure 8: Correct notching (placeholder)

Deadman anchors

Deadman anchors are logs buried in the ground to provide an anchor point when suitable stumps are not available.

If using a deadman anchor, make sure:

- the logs are properly installed and of a strength, length and diameter to withstand the load to be imposed
- the log size and design of the installation takes into account the:
 - soil conditions
 - slope and angle of the ground
 - angle of pull on the guyline
 - size of the yarder and the
 - rigging system being used
- trenches for deadman anchors are at right angles to the line of pull and have a vertical front wall
- the strop connecting the rope to the deadman anchor:
 - passes around the deadman and has both ends protruding from the ground
 - is positioned so that the ends share the load equally
 - is at least the strength of the rope that it is being attached to
 - has both eyes of the strop attached to the rope with a shackle.

Rigging gear

When setting up rigging consider the following:

- Make sure all shackles made of high-tensile steel or alloy steel and fitted with high-tensile pins.
- Make sure that all shackles are rated equal to, or higher than, the rigging gear (ropes) they are connected to.
- Secure the pins of hanging shackles with a molle or split pin.
- Make sure guyline shackles have their pins on the yarders side of the connection unless they are on mobile plant used as a tailhold, where the shackles are reversed.
- Only use hammerlocks in place of shackles when they have an equivalent or greater safe working load than the shackle they are replacing.
- Make sure all shackles, rigging screws and turnbuckles:
 - are tested and marked with their safe working load
 - have a breaking strength at least equal to the rope to which they are rigged.
- Fit yarder towers with a strop or other safety device which can contain the fall of operating ropes and tackle if a failure of the lead block, blocks or securing tackle occurs.
- Only undertake tower maintenance when the tower is down.
- If climbing the tower is ever required, assess and manage the risk of fall from heights. If there is the risk of fall from height:
 - the climber needs to use an approved fall restraint harness, a free- fall arrest system and a rope with a minimum rating of at least 22 Kn (kilo Newtons)
 - there is a competent person on site trained in the use of fall restraint harness and who is capable of carrying out a rescue.

Tailspars

When setting up tailspars:

- Top the trees used for elevated support. Use guylines to secure the spar.
- For tree topping, make sure at least two competent people carry out the tree topping and subsequent rigging. They should be trained in the procedures or, if under training, be accompanied by a competent person. The second person should have the necessary climbing equipment, and training, to be able to climb the tailspar and perform a rescue if required.
- Use purpose-built block or elevated support systems when carrying out a rope lift.

Mobile anchors

When setting up mobile anchors:

- Securely position mobile anchors before extraction work commences. For information on best practice for positioning and anchoring mobile plant, see the procedure laid out in industry guidance.

- Connect skyline and tailrope to suitably engineered attachment points on the mobile plant.
- Make sure attachment points are inspected periodically by a competent person to confirm their structural integrity.
- Apply a handbrake or locking device to prevent unplanned movement.
- Fit and peg a movement alarm and safety lanyard to the rear of any anchor machine to detect unplanned machine movements.

Mobile anchors during operations

When using a mobile anchor, consider the following:

- Make sure no worker is in the mobile anchor or near the mobile anchor while logs are being extracted.
- When shifting the mobile anchor:
 - stop and lower the ropes before the operator gets in the cab
 - make sure the operator wears a seat belt while repositioning
 - after the line shift and repositioning, make sure the operator is off the machine before signaling and full tension is applied.

4.0 Managing the risks – breaking out A note for PCBUs managing the harvesting process

Manual breaking out is one of the most hazardous tasks in forest harvesting. WorkSafe strongly recommends that, so far as is reasonably practicable, breaking out is not used where safer methods are available.

4.1 Introduction to breaking out

Breaking out is a key part of the cable harvesting process. For the breaker-outs it involves stopping and positioning the rigging, hooking on the drag (the trees to be extracted), and after retreating to a safe position, signalling for the break-out of the drag by the yarder and then watching it until it reaches the landing.

It is one of the most hazardous jobs in forestry.

This guidance looks at how to manage the risks of breaking out.

The forestry industry has produced detailed guidance on breaking out and its procedures. For more information, go to (insert link).

4.2 Safe breaker-out

Breaker-outs have a very specialised job which requires them to be physically fit and agile, constantly alert, and mentally quick.

If you are a breaker-out, you should make sure that you:

- get good sleep
- drink lots of fluids and eat well
- take good rest breaks
- keep physically fit
- do not let drugs or alcohol impair your judgement
- do not work when fatigued or injured.

Making sure that breaker-outs have the right training and supervision

Breaking out is a high-risk activity.

All breaker-outs need to be qualified.

If they are being trained, they need to be under supervision of a competent person.

No worker should be allowed on the breaking out face unless they are qualified or under training supervision.

Head breaker-outs need a higher qualification.

The industry-recognised qualifications for breaking out are listed in Appendix (number).

More information on the training, information, instruction and supervision requirements of PCBUs can be found in Part G.

Making sure that workers are involved in managing risk

Breaker-outs are exposed to a significant number of hazards in a normal workday. They should know:

- the hazards and risks they face
- what control measures there are to manage the risks and how to apply them.

You must engage with workers when identifying the hazards, assessing risks and deciding what control measures to use to eliminate or minimise those risks. They are the ones on the ground. They know the ins and outs of how they do things, what the risks are, and whether a control measure would be practicable.

Hazards, risks and control measures should be documented. All workers should know where to find this information.

All workers should be involved in daily tailgate meetings to talk about the day's work plan, and to identify any new hazards/risks.

Managing health risks

Part B explains common health risks that workers may face. However, there are two health hazards that are common among breaker-outs: fatigue and dehydration.

Fatigue

Fatigue is a constant risk for breaker-outs. Acute fatigue from intense periods of physical activity can have considerable effects on health and safety. Signs include:

- making mistakes
- getting careless
- having slower reactions
- bad moods
- forgetfulness
- lack of motivation.

What can make fatigue worse

Breaker-out fatigue can be made worse by:

- cloudy days
- not being able to see clearly (mist or haze)
- high temperatures
- low temperatures (frost/snow)
- wet weather
- high noise
- tasks which are difficult or carry on for long periods of time
- tasks which are repetitive, monotonous and boring
- difficult conditions underfoot (slippery ground or stems, high hindrance undergrowth).

What can be done to manage fatigue

Fatigue is a known and common risk for breaker-outs. It should be planned for.

A fatigue management plan will help, but the basics are that breaker-outs should eat and drink well, have a good night's sleep and take work breaks.

The following could be used in a fatigue management plan:

- Have at least two 30-minute breaks per day.
- Take micro breaks. A break of 5 minutes per hour can make a big difference.
- Limit work hours. Industry recommends no more than:
 - 13 hours per day, including travel but not counting rest breaks
 - 65 hours in seven days, including travel time
 - 6 successive days.
- Keep a log of hours worked.
- Take breaks and stop operating if breaker-outs have lost concentration.
- Minimise lengths of breaker-outs shifts, or rotate breaker-out teams.
- Do not allow breaker-outs to work if showing signs of being fatigued.
- Do not do unsafe work, and do not let production pressure affect decisions.

For more information on managing fatigue, see Section 10.

Dehydration

Dehydration occurs by either not drinking enough fluid or by drinking the wrong types of fluid.

When dehydration happens, it can cause premature fatigue and difficulty in concentrating. Breaking out requires continual concentration so it is important that breaker-outs drink regularly and drink well during the day.

It is recommended that breaker-outs:

- regularly drink fluids at a rate of at least half-a-litre per hour, and up to one litre-perhour when it is hot
- drink before feeling thirsty
 - avoid drinking energy drinks, soft drinks or cordials during the workday
 - save drinking energy drinks, soft drinks etc until after work to replace energy
- drink plenty of water at night to recharge the body for the next day
- drink a couple of glasses of water before leaving for work.

Personal protective equipment (PPE)

Breaker-outs must wear the appropriate PPE. The PPE for machine operators should include:

- high-vis shirt, vest or jacket with night glow for increased visibility
- high-vis helmet

- hearing protection if noise exceeds 85 dB (for example, using a chainsaw or shifting a mobile tailhold)
- safety footwear
- gloves leather or thick cotton are recommended if there is risk of hand injury from the strops being used.

Other useful equipment can include:

- a small personal first aid kit
- a hydration system such as a camelback or water bottle
- sunscreen
- a raincoat and warm clothing for cold and wet days.

For specific requirements for providing PPE, see Part G.

A note on boots

Safety footwear should provide good ankle support and be suitable for the terrain and traction requirements.

Spiked boots are recommended for breaking out unless the ground is rocky. Also, spiked boots have their risks:

- they can wear out which can cause a slipping hazard
- they need checking to make sure spikes are not missing
- extreme caution must be used when climbing on or off a mobile tailhold machine. In addition, rubber mats or wooden pads should be used on the floors or pedals to avoid slipping.

Helmets and identifying the head breaker-out

It is becoming common practice for the head breaker-out to wear a different colour highvis and helmet to the other breaker-outs. This not only identifies the head breaker-out but is also a good visual guide as to where the breaker-outs are standing during an extraction.

Breaker-outs should always be standing behind the head breaker-out when the 'go ahead' is given.

Communications

It is crucial for the breaker-out and the cable yarder operator to be able to communicate quickly and effectively. It makes sure that:

- ropes and rigging are positioned correctly before the breaker-outs move in to strop the stems
- break out does not start until all the breaker-outs are in a safe retreat position
- the cable yarder can be told of any stropping issues such as a gut hook
- an emergency can be signalled immediately.

Normally the head breaker-out does the signalling. However, other breaker-outs should also carry signalling equipment in case of an emergency or if the head breaker-out is away from the hook-on zone.

Ways to communicate

The three common ways of communicating between a breaker-out and cable yarder operator are:

- radio communications (RT)
- tooter signals
- hand signals.

All workers should be familiar with the communication system and commands used in their workplace.

Everyone needs to know the two signals for 'emergency', and for 'stop the rope'.

Emergency!

- Tooter: one long continuous blast on the tooter or horn.
- Radio: 'Emergency, emergency, emergency'.
- **Hand signals**: Both arms vertically above the head, waving from vertical to horizontal if necessary to get attention.

Stop

- Tooter: one short blast.
- Radio: 'Stop' or 'Ho'.
- Hand signals: One arm vertically above the head.

Using the radio (RT)

An RT (radio transmitter) is an important tool for clear and fast communication between breaker-outs and the hauler operator.

It is essential that the head breaker-out has RT communication, However, we recommend that all breaker-outs have RT.

The breaker-out should hold the RT during break out and in haul to allow quick communication in the event of a fouled drag or other issue.

- Breaker-outs should use approved crew commands on the RT, for example, 'go ahead', 'stop', 'raise the rigging'
- Test RTs daily before work starts to make sure they are on the right channel and fully charged.

The head breaker-out

The head breaker-out controls the break-out operation and is responsible for ensuring the safety of the breaker-outs.

They should be in control of the break-out face at all times.

They determine the location of the backline and backline anchors and manage the lineshifts.

The head breaker-out needs to be competent, experienced and trained. They should hold the industry-recognised qualification required for head breaker-outs (see Standards and Qualifications, Appendix x).

4.3 Safe site

One of the most critical jobs in manual cable yarding is determining the safe retreat position.

The safe retreat position is where a breaker out should stand to be clear of moving ropes, rigging or stems or any hazard that might happen during a drag.

The safe retreat position process

Planning – principal and contractor

The principal should develop a plan or job prescription before harvesting starts. The principal should give the plan (which includes information on the area to be harvested and known hazards on the site) to the contractor.

If the agreed process between the principal and contractor involves breaking out, both the principal and contractor should come to an agreement about how to determine safe retreat positions on the block being harvested.

Contractor and extraction team

The contractor should work with the extraction team (the head breaker-out, breaker-outs and yarder operator) to determine the safe retreat position.

Document the safe retreat position process. Make sure the process is clearly understood, agreed and carried out by the extraction crew.

Hold a daily meeting to determine the breaking out plan and agree on safe retreat positions for the setting or day's work.

Determining the safe retreat position

The safe retreat position should take into account:

- the risk of a swinging or upending log or stem
- the mean tree height
- the terrain
- obstacles that may restrict movement or obscure vision
- material likely to be dislodged during extraction
- overhead hazards that may fall into the work area
- any rope bight

- the risk of logs or stems being dislodged from the landing and sliding downhill.

Measuring the safe retreat position

The head breaker-out needs to:

- make sure that all breaker-outs are at the determined safe retreat position.
- have a method of accurately measuring this distance.

The method to measure distance could include using:

- rangefinders
- GPS monitoring
- camera systems monitored by the hauler operator.

Changing the safe retreat position during the day

There should be processes for changing the safe retreat position during the day as hazards change.

Communicate any changes to the plan to the hauler operator or crew manager. Document any changes.

The head breaker-out can decide if the safe retreat position needs to be moved further away from the ropes.

The approval of the crew manager is needed to move the safe retreat position closer to the ropes.

Using the default process

If there is not a documented process for determining the safe retreat position, use the default process.

The default process is the safe retreat position is a distance of 1.5 tree lengths (based on the mean tree height) at right angles and horizontal to the drag.

With the default process the safe retreat position should be clearly marked with flags or other visible markers.

4.4 Safe practice

Stay away positions at all time

Breaker-outs should never move or be positioned underneath:

- any moving rope
- a mechanical slack-pulling carriage feeding slack
- any carriage or butt rigging being raised or lowered during break out
- a tensioned skyline during outhaul or inhaul
- operating ropes being shifted by a mobile tailhold.

During outhaul

During outhaul, all breaker-outs should be a minimum of 15 metres from any moving rope.

Before hooking-on

Breaker-outs should stay out of the hook-on area until:

- the 'Stop' signal has been given
- the carriage or rigging has stopped moving
- the swinging strops can be safely controlled.

Hook-on

Breaker-outs should never stand directly under ropes or rigging when slack is being fed out or ropes are being lowered.

Breaker-outs may stand to side of the rigging, holding onto their strop as it is lowered, provided:

- they have been warned that the lowering is happening
- they are watching from a safe position.

Hook-on with butt-pulled stem

So far as is reasonably practicable, butt-pulled stems should have their strops attached within three metres of the butt-end of the stem.

Hook-on with head-pulled stem

So far as is reasonably practicable, head-pulled stems should have their strops attached within five metres from the top end of the stem.

Gut-hooked or long-stropped stems

If any drag is long-stropped or gut-hooked, the head breaker-out should:

- immediately communicate to the yarder operator so that others can be warned of the hazard, or
 - stop after the break-out so the stems can be re-hooked.

Lowering rigging further after stems have been attached

There may be situations where it is acceptable to lower rigging further, after stems have been attached, to pick up stems that are slightly out-of-reach. If this is done, the following actions should be followed:

- if there is any chance of the attached stem moving, the breaker-outs have to let go of all strops and move to a safe position that is out of reach of ropes, rigging and the stem
- if the lowering of the rigging can be done without moving the stem, the breaker-out may hold onto the strop but only if they are not between stems or under any ropes or rigging

- if any drum is engaged to move the rigging back or forward, the breaker-outs need to let go their strops and move to a safe position that is out of reach of ropes, rigging and the stems.

Signalling the break-out

Before signalling the break-out, the head breaker-out needs to make sure that all breakerouts are in the safe retreat position and behind the head breaker-out. All breaker-outs must be facing and watching the drag.

The drag

The head breaker-out needs to watch the lines and the drag until either:

- the drag is out of sight
- the yarder operator takes over control, or
- another competent breaker-out is assigned to monitor the lines and the drag.

A fouled drag

If a drag becomes fouled, the breaker-out should signal to stop the drag immediately.

Before any attempt is made to release strops or cut any stem with a chainsaw, slacken the mainrope, tailrope and slack-pulling rope (if appropriate) to release tension.

No breaker-out should leave the safe retreat position while the ropes in a fouled drag are under tension.

Clearing the chute

Confirm that all breaker-outs are in a safe position before clearing stems from the chute.

Line shifts

When any line-shift operation is taking place, all breaker-outs and other operators have to be in a designated safe area and clear of any rope movement.

(Procedure for retrieving strawline to come)

5.0 Managing the risks – mobile plant

5.1 Introduction to mobile plant

Mobile plant is an essential part of the forest industry. It includes:

- wheeled and tracked skidders
- forwarders
- excavator-based machines
- mechanised harvesters and processors
- wheeled loaders
- all-terrain vehicles (ATVs).

Each machine has its own characteristics and requirements and will have its own risks to be managed.

This guidance looks at the general risks of mobile plant and how to manage them.

For specific types of mobile plant, you will find more information in the sections on Mechanised harvesters (link), Steep slope harvesting (link) and Mechanised processors (link)

If you would like more information, the forestry industry has produced detailed guidance on mobile plant. To find that, go to (insert link).

5.2 Safe operators

Machine operators working in forestry operations need to be physically fit, alert and mentally capable if they are to do their job safely.

If you are an operator, you should make sure that you:

- get good sleep
- keep physically fit
- take good rest breaks
- drink lots of fluids and eat well
- do not let drugs or alcohol impair your judgement.

Training and supervision

All mobile plant requires some specialist knowledge and training. All operators of a machine should be familiar with the manufacturer's operator safety manual and how to operate the machine.

All operators should be qualified in the operation of their machine and skilled in the tasks they will be doing.

If operators are still gaining experience they should be under the supervision of a competent person.

No worker should be allowed to operate a machine unsupervised until they have demonstrated their competence.

Making sure workers are involved

All operators should be involved in daily tailgate meetings and daily work planning including hazard identification, and risk assessment and management.

All operators should know who is on site or might be coming on site.

Recognising hazards/risks

All operators should know and understand the hazards/risks they will face while on the job and the control measures to manage those risks.

Before starting any new block, all crew members should be involved in identifying significant hazards/risks on the ground and in the operational process. They should know what the control measures are for those risks and how to apply them.

Document all hazards/risks and control measures. All crew members should know where to find this information.

Managing health hazards

Operators should also be aware of health hazards that can arise from operating their machines.

Part B explains common health risks that workers may face. However, there are three health hazards that are common among mechanised harvester operators: work-related musculoskeletal disorders (you probably know them as OOS or RSI), dehydration, and fatigue.

Work-related Musculoskeletal Disorders (WRMD)

These are the strains, sprains, aches and discomfort that you can get in your muscles or joints when working continuously and often with repetitive movement. Basically, your muscles become fatigued.

The most common WRMD injuries in machine operators occur in the wrists, hands, shoulders, neck and back.

Many machines have their cab layout and fittings designed to help minimise the risk of injury with ergonomic joystick controls and seats. But the operator is still in the cab for what can be many hours.

Although sitting still, operators still use many muscles to brace and counter the movement of the machine. This is where musculoskeletal problems can arise.

To manage the risk of these problems you should make sure:

- all machines, so far as is reasonably practicable, have ergonomically designed controls and seating to minimise risk to the operator
- the seating and controls are adjusted for each operator before they start work in the machine
- operators rest muscles frequently with micro-pauses while working the machine

- operators take regular breaks and stretch their muscles and joints outside of the machine.

For more information on musculoskeletal disorders, see Section 19.

Dehydration

Dehydration occurs by either not drinking enough fluid or by drinking the wrong types of fluid.

When it happens, it can cause premature fatigue and difficulty in concentrating. Operating a machine requires a lot of concentration and it is important that machine operators drink regularly and drink well during the day. If you are a machine operator it is recommended that you:

- carry enough drink in the cab to drink regularly throughout the day
- drink enough that you have to urinate regularly during the workday
- avoid drinking energy drinks or soft drinks and cordials during the workday
- save drinking energy drinks, soft drinks etc until after work to replace energy
- drink plenty of water at night to recharge the body for the next day
- make sure the air conditioning (if it is fitted) in the cab is working effectively. (If it is not working, let the foreman know so it can be fixed.)

Fatigue

Fatigue is common risk for all machine operators which should be planned for. A fatigue management plan helps the operator manage their work health. It does help that you eat and drink well (see above), have a good night's sleep, and take work breaks.

The following could be used in a fatigue management plan.

- Build in a minimum 15-minute break every three hours, or two 30-minute breaks per day.
- Take micro breaks. A break of five minutes per hour can make a big difference.
- Limit work hours. Industry recommends no more than:
 - 13 hours per day, including travel but not counting rest breaks

65 hours in seven day, including travel time

- six successive days.
- Keep a log of hours worked.
- Look after yourself. Take breaks and stop operating if you have lost concentration.
- Do not operate the machine if fatigued.
- Do not do unsafe work, and do not let production pressure affect your decisions.

For more information on managing fatigue, see Section 10.

Personal protective equipment (PPE)

All machine operators must wear the appropriate PPE.

The PPE for machine operators should include:

- high-vis shirt, vest or jacket with night glow for increased visibility
- high-vis helmet, particularly when working outside a protected cab
- hearing protection
- safety footwear (machine operators should not wear spiked footwear).

Other useful equipment can include:

- gloves leather or thick cotton
- protective eyewear
- a small personal first aid kit

For specific requirements for providing PPE, see Part G.

Communications

Equip all machine operators with a good and reliable communications system, usually RT. Relying on a worker's mobile phone is not acceptable or considered good practice.

Have a communications protocol for operators (and all workers) to check-in regularly, for example every 30 minutes, if they are working away from the skid.

Operators should always radio in when leaving their machine, and again when coming back.

5.3 Safe machine

Safety and protective structures

All forestry mobile plant should have protective structures and equipment that meet their planned use.

Machine, location and task	Should have:
Machines working in standing trees	falling object protective structures (FOPS)
Machines working where there is risk of objects entering the cab	operator protective objects structures (OPS) approved chainshot guards and 19 mm polycarbonate protective windshields as required
Machines (not including hydraulic excavators) working on sloping or rough terrain that may cause instability	rollover protective structures (ROPS) an approved seatbelt system or other safety restraint
Hydraulic excavators working on sloping or rough terrain that may cause instability	cabin operator protective structures (COPS) or tip-over protective structures (TOPS) an approved seatbelt system or other safety restraint
Machines working at night	lights capable of illuminating the area being worked
Machines with structures that may come into contact with overhead power lines	appropriate warning displayed in the cab consider use of proximity alarms or warning devices
Machines with exposed drumlines and rotating flywheels	guarding in place and secure

Table 1: Protective structures and equipment for mobile plant

Note: In some cases, and particularly with more modern machines, these different protective structures could be the same structure.

Emergency exits

All machines and processors should have emergency exits that can be activated internally and externally.

Where the machine operates on any slope where there is risk of instability, it should have three (3) emergency entry/exits in the event of a rollover or tip over

No emergency exits should be blocked or hindered by protective structures

All emergency exits should be accessible and usable by the operator. The operator should ensure that they are able to exit quickly in the event of an emergency.

Where the machine has doors with latches, the latches should function properly, and the doors should be closed and latched when the machine is in use.

Braking standards

All machines should have a braking mechanism capable of holding itself and its load on any slope on which it is operating.

Where winch-assist is being used, the winch braking system should be capable of holding the machine if traction or stability is lost.

Fire extinguishers and fire suppression systems

All machines should have fire extinguishers appropriate to the size of the machine.

The fire extinguishers should be secured, easily identified, and easily accessible.

All plant operating on steep slopes should have a fire suppression system in the engine bay, so far as is reasonably practicable.

Seatbelts and seat restraints

All mobile plant should be fitted with a seatbelt. The seatbelt should be worn at all times.

All mobile plant operated on steep slopes must be fitted with a multipoint seat belt which provides shoulder restraint.

Emergency stop

All mobile plant operated on steep slopes should have an emergency stop button that immediately brakes the winch or machine.

Noise insulation

Working in mobile plant exposes the operator to continual noise. If the noise levels are too high, or prolonged, they can lead to hearing loss.

Modern cabs are generally well insulated from engine noise, but you should still be aware of the risk. To avoid noise-induced hearing loss:

- noise levels should be below 85dB(A) on average and 140 dB(A) at peak. If possible, replace machinery that creates noise above these levels
- if you cannot replace the machinery, consider if there are ways to reduce noise exposure, such as engine insulation and keeping doors and windows closed while working
- if noise levels are still too high, operators should wear hearing protection.

First aid equipment

All workers must have access to first aid facilities, equipment and first aiders.

For more information see Part G.

First aid kits kept in a machine should be:

- easily identified
- easily found and accessed
- kept up to date
- regularly checked and replenished and replaced as required.

Objects secured in cab

Secure all loose objects in the cab so that they do not interfere with the operator or the safe operation of the machine.

5.4 Safe practice

Machine operation

Operate all mobile plant to the manufacturer's specifications and limits (if supplied).

Develop and put in place a specific hazard management plan if there is any risk of instability of the machine because of slope, terrain or ground conditions.

The operator should make sure that:

- all objects in the cab are secured
- the machine's controls and safety devices are checked before daily use
- any repairs or due maintenance are noted and reported.

No one should get on or off a moving machine

No one should ride in a machine unless it has proper seating and seat restraints for that person – this applies particularly to carrying passengers

If the machine is shut down or left unattended with the engine running:

- apply the brakes
- rest any blades, attachments or accessories on the ground.

Maintenance and repairs

Service and maintain all machines in keeping with the manufacturer's recommendations. This includes daily pre-start checks and regular audits.

Note and repair all machine faults.

Remove the machine from use if the machine fault puts the safety of the machine and operator at risk. Do not use the machine until it is repaired.

Make sure the operators are familiar with:

- where the operator's manuals are kept
- the daily pre-start checklist
 - what safety devices are fitted, how they operate and how they should be maintained
- the lock out procedures for the machine.

Safe procedures for maintaining and repairing mobile plant

A considerable number of injuries occur during machinery repair and maintenance. This section looks at procedures for making sure that repair and maintenance work can be carried out safely and without harm. Follow these steps.

- 1. Think about what could go wrong.
- 2. Have a plan and make sure that everyone knows what is going on and who will be doing what.
- 3. Have a designated area for repairs (if possible). Cone it off. Make sure that everybody knows that any machine in there is not to be operated.

- 4. Before staring, make sure all attachments are on the ground.
- 5. Isolate it. Engine off, take the keys out of the ignition, isolator on (if it has one).
- 6. Turn the computer off.
- 7. Put in any locking pins for booms, heads etc.
- 8. Remove residual hydraulic pressure in the operating lines. As an extra precaution, if working on hydraulic hoses, 'crack' the hose by a turn, stand back and give the hose a wiggle just in case there is residual pressure.
- Put 'Do not operate' tags on. Make sure that they are large and easily seen. Put them in critical places such as the cab door and inside where the operator's controls are.
- 10. If working on fuel lines, get expert advice. Do not touch them unless the engine has been switched off for at least 10 minutes.
- 11. If putting the machine on blocks, never get any part of your body between the top of the block and the frame of the machine.
- 12. Chock wheels to prevent any vehicle movement
- 13. At every step, always think 'What if?'

5.5 Safe site

Managing worker/machine separation

All mobile plant operators should be aware of who is in their work site, and where they are.

Stop work if there is any risk that a worker is in the vicinity of a machine, and is not accounted for or cannot be seen by the operator. Do not restart work until they know where that worker is.

Establish minimum distances for all forms of mobile plant operation to make sure that workers and others are clear of the machine.

No worker should approach a machine without:

contacting the operator by RT saying that they want to approach

receiving clear approval to approach.

If a mobile plant operator is working within two tree lengths of any tree felling, they should not leave the machine.

5.6 Using all-terrain vehicles

All-terrain vehicles (ATVs) are a commonly used vehicle in many forestry operations, particularly silviculture. They are small compared with most mobile plant, but they still pose considerable risk, particularly from rollover.

If you use an ATV, consider the following:

- All ATVs should have operator protection against the risk of rollover or tipping.

- No ATV should carry passengers unless it has seating designed for carrying passengers.
- All implements carried on an ATV should be safely secured.
- All ATVs should have approved helmets with the vehicle for the number of people the ATV is permitted to carry.
- Operators and passengers on ATVs wear the helmets provided.

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