

FACT SHEET

## WINCH-ASSISTED HARVESTING ON STEEP SLOPES

**Well-managed mechanised felling carries lower risk to workers than manual felling; however, there remains risk to operators using winch-assist machines on steep slopes. An operator could be seriously injured or killed without effective controls in place.**

It is essential to identify and assess the risks associated with winch-assisted harvesting on steep slopes.

Two distinct winch-assisted steep slope harvesting systems currently in use are:

1. systems with one rope, where the winch is attached to the harvesting machine (integral)
2. systems with one or more winches fitted to a machine positioned at the top of an incline (independent).

These machines are used to provide winch assistance to:

- > harvesters felling and bunching trees for extraction
- > knuckle boom loaders/excavators engaged in shovel-logging trees.

On a steep slope, anchoring systems go a long way towards controlling the risk. However, there is always a chance of a system failure, and the machine slipping or rolling.

### APPROVED CODE OF PRACTICE RULES

Section 6.4 of the *Approved Code of Practice for Safety and Health in Forest Operations*, offers some rules around winch-assisted harvesting on steep slopes. However, as new solutions to steep slope harvesting are developed and put in place, further clarification is needed.

*6.4.1 All mobile plant using the assistance of a wire rope and/or winch shall be specifically designed, tested, demonstrated to be safe, and certified by a Chartered Professional Engineer to be safe when operated on steep slopes.*

To meet the requirements of 6.4.1, duty holders should ensure that:

- > the winch is designed and tested to ensure sufficient power to provide traction assistance on the slope the machine is operating on.
- > the winch braking system is designed and tested to ensure the machine holds if traction or stability is lost on the slope the machine is operating on.
- > a Chartered Professional Engineer (CPEng) has certified the winch-assisted steep slope harvesting system as designed, tested and demonstrated to be safe.

This should include an assessment of:

- fail to safe design features
- safe operating procedures
- maintenance schedules and
- a list of all rigging components and their breaking loads.

The manufacturer should perform this certification, but certification will be needed again where a machine is significantly modified. For example, a machine manufactured to include winch-assist may be certified by the manufacturer, but an excavator re-purposed for steep slopes by attaching a winch will need a CPEng to certify the modification as safe.

*6.4.2 The tension on the wire rope shall be restricted to 33 percent of its breaking load at all times.*

AS 2759 – Steel Wire Rope, Safe use, Operation & Maintenance should also be considered when using wire rope. AS/NZS 1418 – Cranes, Hoists, and Winches clearly defines the specifications required in cranes, hoists, and winches, including safe working load and tension limits.

*6.4.3 The maximum operating weight of the mobile plant shall not exceed the rated breaking load of the wire rope.*

This rule can be reasonably extended to all rigging components. The maximum operating weight should be the weight when fully loaded.

*6.4.4 An emergency back-up system shall be incorporated into the operation to ensure the stability of the mobile plant should the winch, wire rope or anchor fail.*

Some emergency back-up systems that would help an operator to meet the requirements of 6.4.4 are:

- > a second winch rope

- > a blade or other hydraulic attachment, which can be lowered in an emergency to stop the machine from sliding or rolling
- > a warning device to warn the machine operator of anchor movement.

Any system or combination of systems needs to be supported by appropriate training and safe operating procedures. Systems also require ongoing monitoring and review to ensure risks are effectively controlled. Regular reviews ensure that new risks are identified and that existing controls are working effectively.

*6.4.5 All winch-assisted mobile plant operations shall have a documented safe work best practice, including as a minimum:*

- > *hazard management*
- > *machine and wire rope inspection and maintenance routines, conducted by competent person*
- > *operator fatigue plans*
- > *work alone procedures*
- > *an emergency plan.*

Further to rule 6.4.5, the documented winch assist practice document should include:

- > an operating plan including a map indicating slope and terrain features
- > slope/soil condition operating guidance
- > safe operating procedures
- > training requirements
- > daily prestart checks
- > competency standards for both operators and those responsible for safety checks and maintenance.

*6.4.6 All winch-assisted mobile plant shall be constructed to provide adequate emergency access and egress points that can be activated internally and externally.*

WorkSafe recommends three exit points, to manage the risk of one or more access points being obstructed in a case of rollover.

## ADDITIONAL GUIDANCE

A person conducting a business or undertaking (PCBU) should also consider the following advice:

- > All mobile plant operated on steep slopes must be fitted with a multipoint seat belt which provides shoulder restraint.
- > All mobile plant and winch systems used for steep slope harvesting should have an annual engineering and mechanical inspection by a competent person (eg a CPEng, or the original manufacturer) and be tagged as certified. Information on the certification plate should include:
  - owner of the mobile plant
  - make, model, serial number
  - inspection expiry
  - certifier number.
- > All mobile plant operated on steep slopes using winch assistance should, as a minimum, have a fire extinguisher securely fastened in the cab.
- > All mobile plant should have an emergency stop button that immediately brakes the winch or machine.
- > Anchors should be selected and constructed by a competent person, and checked daily.
- > Independent winch systems should be positioned and anchored securely by a competent person.
- > Joining splices should not be used to join broken or damaged winch ropes.
- > Wire ropes used for winch-assisted harvesting on steep slopes should not be used for log extraction or hauling. They should only ever be used in the winch system.

## FURTHER INFORMATION

- > Health and Safety at Work Act 2015 (HSWA)
- > Health and Safety in Employment Regulations 1995
- > Approved Code of Practice for Safety and Health in Forest Operations
- > Approved Code of Practice for Safety and Health in Forest Operations: Roles and Responsibilities of Principals and Contractors
- > Approved Code of Practice for Operator Protective Structures on Self-Propelled Mobile Mechanical Plant
- > AS/NZS 1418 - Cranes, Hoists, and Winches
- > AS 2759 - Steel Wire Rope, Safe use, Operation & Maintenance

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