



Forest Machine Operations

Handouts to accompany
Record of Registration

MWMAC Ltd
Unit 4 East Street Enterprise Park, Rhayader, LD6 5ER
01597 810306
info@mwwmac.co.uk
www.mwwmac.co.uk
Registered Office: Morgan Griffiths, Cross Chambers, Newtown, SY16 2NY
Company Number: 412684

mwwmac
TRAINING FOR PROFESSIONALS

This handout pack has been put together to accompany the Record of Registration for City & Guilds NPTC Forest Machine Operations.

The Guidance Documents included within this handout pack should be used to assist you with your At-Work Training.

You will only use those guides that are relevant to the Forest Machine Operation you are undertaking.

Contents:

- **FISA Guides:**

- Extraction by Skidder
- Extraction by Forwarder
- Extraction by Cable Crane
- Mechanical Harvesting
- Mechanical Roadside Processing
- Flails and Mulchers in Treework
- Debogging and Recovery of Forestry Machines
- Excavators in Treework
- Steep Slope Working in Forestry
- Emergency Planning
- Firefighting
- Electricity at Work
- Look up, Stay aLive
- Training and Certification

Further FISA Guidance can be found at:

<https://www.ukfisa.com/safety-information.html>

- **HSE Guides:**

- Risk Assessment
- Whole Body Vibration
- Lifting Equipment at Work
- Do not go near Leaks
- Providing and Using Work Equipment Safely
- First Aid at Work
- Noise

Further HSE Guidance can be found at:

<http://www.hse.gov.uk/guidance/index.htm>

1st November 2017

Record of Registration for City & Guilds NPTC Forest Machine Operation(s)

(Originally known as a "Provisional Licence")

The History

Historically known as the "Provisional Licence" scheme and originally administered by FCA, Forestry Commission L&D Branch Ae & mwmac Ltd; the scheme was designed to enable candidates to gain at-work training, supervised by an appropriate qualified person, prior to City & Guilds NPTC Forest Machine Operation(s) Assessment whilst enabling Employers to fulfil contracts requiring that all employees hold the relevant machinery certification.

The Record of Registration Form

The Record of Registration (RoR) has recently been updated by mwmac Ltd in order to create a more effective working document for those involved with a Candidate's at-work training and work experience in readiness for their City & Guilds NPTC FMO Assessment.

The **new** Record of Registration form is designed to be more relevant to the tasks being planned and completed at work. It is a place to plan and record at-work training and supervision and includes a section to record any actions to be taken by the candidate in order to develop their skills.

Example of the new Record of Registration is below:



mwmac Ltd Record of Registration for City & Guilds NPTC Forest Machine Operations

SECTION 1: This is to confirm that the following individual has been registered for the Forest Machine Operation Qualification(s) listed below:

Candidate Full Name:	Date of Birth:	C&G NPTC No:
Candidate Address:		
Employer:	Employer Contact No:	
Name of Qualified At-Work Supervisor:	Qualified Supervisor C&G NPTC No:	
C&G NPTC Qualification Registered:		
Machinery being used:		
Registration Date:	Expiry date:	

SECTION 2: This Record of Registration is valid for a period of 6 months from Registration Date and becomes a "Provisional Licence" when Section 2 & 3 are fully complete:

Evidence of Previous Experience: What experience is the Candidate bringing to the site?		
Similar previous work carried out:	Machine(s) used:	Duration from/to:

At-Work Supervision and Mentoring Plan/Record: Use this section to record all at-work training planned & completed under the supervision of the Qualified Person.				
Skill to be carried out/trained:	Target Date:	Feedback:	Action: (if any)	Initial: (when complete)

SECTION 3: Signatures below indicate that the plan has been agreed with all parties for the above supervised at-work training, to be completed and assessment arranged within the 6 month period:

Print Name of Candidate:	Signature:	Date:
Print Name of Employer:	Signature:	Date:
Print Name of FWM or Contract Supervisor:	Signature:	Date:

mwmac Ltd, Unit 4 East Street Enterprise Park, Rhayader, Powys, LD6 5ER
01597 810306 - www.mwmac.co.uk - enquiries@mwmac.co.uk

Section 1 contains the candidate's registration information:

- Registered Candidate's personal details
- Qualification(s) being worked towards
- Name of Qualified At-Work Supervisor
- Machinery being used
- Registration and Expiry Date

Section 2 contains the Evidence of Previous Experience and the At Work Supervision and Mentoring Plan/Record:

Evidence of Previous Experience

- Similar machinery experience or previous work can be indicated by the candidate.
- The work experience of the candidate during the term of the RoR can be recorded here also.

At-Work Supervision and Mentoring Plan/Record

- The Candidate and Employer can plan, with the qualified supervisor, at-work training and work experience including a target date for completion.
- The Qualified At-Work Supervisor can provide feedback during and/or after supervision or training and include any action points to the Candidate.

Section 3 must be completed to indicate that a plan of action has been agreed with all parties. **Once the plan is recorded, agreed and signed the "Provisional Licence" status is active.**

Subsequent City & Guilds NPTC FMO Assessment **must** be arranged **within the 6 month RoR period.**

Record of Registration - Definitions, Roles & Responsibilities:

Candidate	<i>Definition:</i>	The person undertaking their at-work training in readiness for their City & Guilds NPTC Assessment.
	<i>Role & Responsibility:</i>	The Candidate is the Learner or Trainee recorded on the RoR. They are fully responsible for their RoR document and will be expected to have this on-site with them at all times. They are responsible for ensuring that any change in their circumstance is communicated to the Registering Centre.
Employer	<i>Definition:</i>	The person or organisation that employs the Candidate (or the Candidate if Self-Employed).
	<i>Role & Responsibility:</i>	The Employer is responsible for ensuring that the RoR is fully utilized by the Candidate and that at-work training is completed and recorded. They are responsible for allocating the Candidate their Qualified At-Work Supervisor and ensuring that they are proficient and qualified to do so.
Qualified At-Work Supervisor	<i>Definition:</i>	The person who will be supervising the Candidates at-work training; this person must be proficient in the use of the machine(s) and must hold the qualification(s) being worked towards.
	<i>Role & Responsibility:</i>	The Qualified At-Work Supervisor is the Mentor, Supervisor and/or Instructor. They are responsible for ensuring that at-work training is planned with the Candidate & their Employer. They are also responsible for ensuring that all at-work training or supervision is actioned and recorded in Section 2 of the RoR.
Forest Works Manager or Contract Supervisor	<i>Definition:</i>	The person employed by the Land Owner (i.e. FC, NRW, Tilhill, Euroforest, Fountains, etc.) to oversee the contractors standard of work on site.
	<i>Role & Responsibility:</i>	The FWM or Contract Supervisor has a monitoring role in the use of the RoR on-site and can request to see the RoR at any time to ensure it is being used effectively by the Candidate. It is recommended that the RoR is seen at Pre-Commencement meetings.
<p>Further information on Duty Holder roles is in FISA INDG294 “Guidance on Managing Health & Safety in Forestry”. https://www.ukfisa.com/assets/files/safetyLibrary/Managing%20Health%20and%20Safety%20in%20Forestry.indg294.pdf FISA Guide 805 clarifies the legal requirements for training (<i>paragraphs 1—7</i>) and the categories of training which are recognised (<i>paragraphs 8—11 and 18</i>). This, and further FISA guidance, can be found on the FISA website.</p>		

What does the Registering Centre need?

When the Employer or Candidate requests a Record of Registration (RoR) they will be expected to provide the Registering Centre with the following:

- Candidate full name, date of birth & current address
- Machine(s) being used including any applicable operations
- Title(s) for the qualification being worked towards
- Name of the agreed Qualified At-Work Supervisor and their date of birth

The Employer or Candidate will be expected to pay the Registering Centre a set-up fee for the RoR and will be advised of the cost for the subsequent City & Guilds NPTC Assessment that the Candidate is working towards.

What does the Employer and/or Candidate receive?

After payment of the RoR set-up fee, the Employer or Candidate will receive, via email:

- Record of Registration
- Record of Registration Guidance Notes
- Any applicable FISA Guidance and the website link for more
- The relevant City & Guilds NPTC Qualification Guidance
- Clear indication of the Expiry Date

When the Candidate is ready to assess, what does the Employer and/or Candidate do?

The Employer or Candidate will be expected to contact the Registering Centre, in good advance of the 6 month expiry, to arrange the City & Guilds NPTC Assessment:

- The Centre will need to know where the Assessment will take place.
- The Centre will request a copy of the completed RoR.
- The Centre will issue invoice for assessment which must be paid before assessment can be arranged.

An Assessor will then be allocated to the Candidate and an Assessment date arranged; reminders will be issued and the Assessment will take place.

How long until Certification?

City & Guilds NPTC have a target of 25 working days to release Certification to the Registering Centre.

The Centre will then post the Certificate to the Candidate, and a digital copy will be emailed to the Employer or Candidate, within 5 working days.

DRIVING THE SKIDDER

- ❑ 25 Do not drive if vision is obscured.
- ❑ 26 Ensure that the stabilisers and butt plate (if fitted) are raised before driving off.
- ❑ 27 Do not allow ropes or chokers to trail on the ground when the tractor is moving.
- ❑ 28 Drop the load before crossing any ground which is rough enough to affect the tractor and load stability.
- ❑ 29 Avoid turning uphill on side slopes.

STACKING

- ❑ 30 Stacks of timber should always be made and maintained in a stable condition.
- ❑ 31 Where there is to be additional manual handling the height of the stacked timber should not exceed about 1m. So far as is reasonably practicable, avoid stack heights above 2m.
- ❑ 32 Take special care in areas frequented by the public. Where appropriate, although not a substitute for safe stacking, a prohibition ('Do not climb on timber stacks') sign conforming to the Health and Safety (Safety Signs and Signals) Regulations 1996 should be displayed, and/or the stacking site enclosed with hazard warning tape.

SKIDDING UNIT MAINTENANCE

- ❑ 33 Carry out maintenance in accordance with the manufacturer's handbook which should be available.
- ❑ 34 Keep a maintenance record.
- ❑ 35 Check ropes, pulleys and chokering equipment for damage or abnormal wear.
- ❑ 36 Check the winch/clambunk structure for distortion, cracks and damage.
- ❑ 37 Check all external nuts, bolts and linkages for security.
- ❑ 38 Ensure all defects are promptly reported and repaired or replaced.

FURTHER READING

<i>Tractor units in tree work</i>	FISA501
<i>Extraction by forwarder</i>	FISA503
<i>Extraction by cable crane</i>	FISA504
<i>Mechanical harvesting</i>	FISA603
<i>Mechanical roadside processing</i>	FISA605
<i>Emergency planning</i>	FISA802
<i>Electricity at work: Forestry</i>	FISA804
<i>Training and certification</i>	FISA805
<i>Managing Public Safety on Harvesting FC</i>	forestry@apsgroup.co.uk
<i>First aid at work: Your questions answered</i>	INDG214
<i>Managing health and safety in forestry</i>	INDG294
<i>Don't lose your hearing</i>	INDG363
<i>A Simple Guide to PUWER</i>	INDG291

These publications are available from the FISA and HSE websites.

NOTES

Name:.....

Checklist verified by:.....

Date:

Further information

This guide is produced by the Forest Industry Safety Accord (FISA) 59 George Street, Edinburgh, EH2 2JG Tel: 0131 240 1410 Fax: 0131 240 1411 Email: info@ukfisa.com

Copies of this guide and all other FISA priced and free publications are available by mail order from the FISA office or through the FISA website www.ukfisa.com. From here you will also be able to access a wide range of additional forestry safety information including frequently updated safety alerts.

This guide sets out evidence of good practice for a specific forestry task. Deviation from the guide should only be considered after a full risk assessment has been undertaken by competent persons. Health and safety obligations MUST be met at all times.

THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG502 Extraction by skidder, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Extraction by skidder



Image courtesy of Forestry Commission Pictorial Library

INTRODUCTION

This leaflet covers the use of a wire, rope, hydratong or clambunk skidder for timber extraction in forestry and other tree work.

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when extracting timber by skidder.

This leaflet does not cover:

- the safety requirements when working within the risk zone of a harvester or processor (see FISA leaflet 605 *Mechanical roadside processing*);
- the safety requirements when the machine is fitted with a loader (see FISA leaflet 503 *Extraction by forwarder paragraphs 11-23*).

You must also assess the effect of the site and the weather as well as following this guidance.

All operators must have had appropriate training in how to operate the machine and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

This leaflet must be read in conjunction with FISA leaflet 501 *Tractor units in tree work*.

GENERAL ADVICE

- ❑ 1 Do not operate a skidding unit if any part of the machine or the tree can come within one tree length + the vicinity zone (down to a minimum distance of 15 m) of energised overhead power lines. The vicinity zone will vary between 1m and 5m depending on line voltages (see FISA leaflet 804 *Electricity at work: Forestry*).
- ❑ 2 The skidding unit must be equipped with ropes and components in a serviceable condition and which meet the manufacturer's recommended specification.
- ❑ 3 Winches and tongs must be compatible with the tractor to which they are to be fitted, and attached according to the manufacturer's instructions.
- ❑ 4 If operating the winch from inside the tractor unit, then suitable operator protection, eg mesh screens, must be fitted to either the tractor or the top of the winch unit.

WIRE ROPES

- ❑ 5 A Test Certificate must accompany the winch ropes when they are purchased and this must be retained.
- ❑ 6 The rope size and lay of the ropes used must be to the winch manufacturer's recommendations. Never attempt to join ropes of different diameters.

- ❑ 7 Make sure sheaves, rollers and other equipment for guiding ropes is compatible with the dimension of the rope and kept in a serviceable condition to avoid damaging wire ropes.
- ❑ 8 Hauling ropes must be securely fastened to the winding drum. At least three full turns should remain on the drums at all times.
- ❑ 9 All ropes should be terminated in a suitable way such as splicing, soft eye loops or swaging – do not use knots.
- ❑ 10 Check daily for visual signs of rope deterioration such as excessive wear, broken wires or strands, distortions and corrosion. Repair or replace broken or damaged ropes without delay.
- ❑ 11 Replace all ropes when their nominal diameter falls below 90% of the original.
- ❑ 12 Broken or badly frayed ropes must be joined by adequate splicing or be replaced. Knots greatly reduce the strength of the ropes and must not be used.

CHOKERING EQUIPMENT

- ❑ 13 Firmly attach all connections for captive chokers to the wire rope. Ensure all terminal connections are firmly attached before use.

CHOKERING AND WINCHING

- ❑ 14 Park the tractor in a stable position where it is as level as possible (see *Figure 1*).

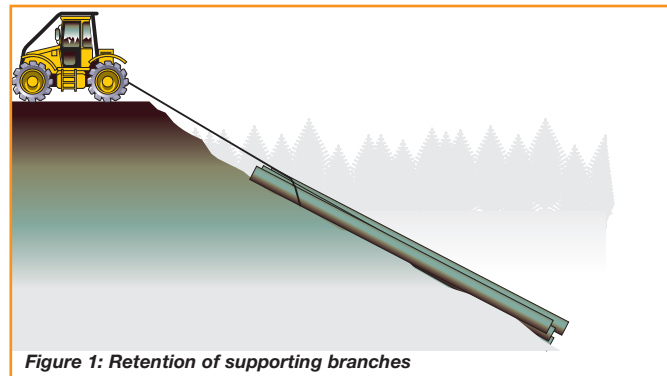


Figure 1: Retention of supporting branches

- ❑ 15 Position the rear of the tractor to face the load (see *Figure 2*). Avoid excessive side hauling. Use a re-direct pulley if required.

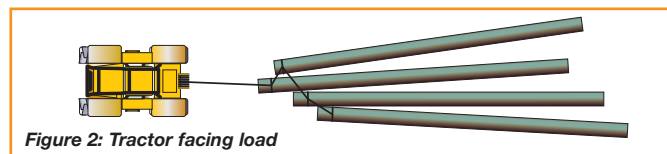


Figure 2: Tractor facing load

- ❑ 16 Ensure that stabilisers and adjustable butt plates (if fitted) are in the lowered position and correctly positioned and adjusted. Make allowance for some rearward movement as the hauling rope is tensioned.
- ❑ 17 When facing down a slope, lower the log-rolling blade (if fitted). Pull the winch rope out smoothly. Attach the chokers securely near the end of the poles keeping the shortest practicable length between the poles and the winch rope.
- ❑ 18 Organise the choking system to allow the load to be freely winched in, avoiding obstructions (see *Figure 3*).

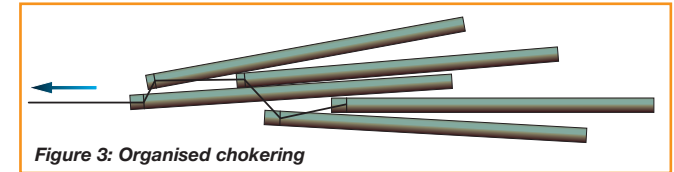


Figure 3: Organised choking

- ❑ 19 If the load becomes snagged, stop winching. Do not continue to pull, release the tension on the rope and take appropriate action to free the load.
- ❑ 20 Ensure the load is winched up close to the butt plate or the notched drawbar.
- ❑ 21 When operating on side slopes with a double drum winch, haul in the load on the upper drum first to improve the tractor stability.
- ❑ 22 Operate the winch controls only from the designated position as specified in the instruction manual. Where winches are operated by lanyard or other remote means, operators should stand to one side of the line of pull, to the higher side if on a side slope and outside the risk zone of where the machine could tip over.
- ❑ 23 Stop work when anyone comes within a distance equal to twice the length of the load and hauling rope (see *Figure 4*).

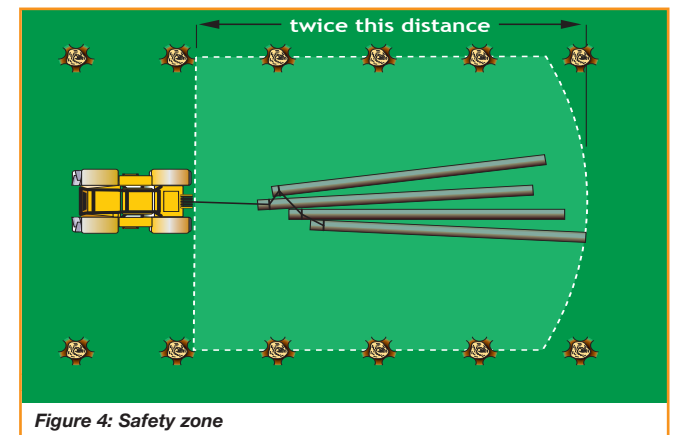


Figure 4: Safety zone

INTRODUCTION

This leaflet covers the use of a tractor and trailer unit fitted with a grapple loader or a purpose-built forwarder for extraction of timber in forestry and other tree work.

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when extracting timber by forwarder.

It does not cover the safety requirements when working within the risk zone of a harvester or processor (see FISA leaflet 605 *Mechanical roadside processing*).

You must also assess the effect of the site and the weather as well as following this guidance.

All operators must have had appropriate training in how to operate the machine and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

This leaflet must be read in conjunction with FISA leaflet 501 *Tractor units in tree work*.

THE MACHINE

- 1 Any risk zone specified by the manufacturer must be clearly and prominently marked on the machine.
- 2 Adequate field lighting must be fitted if working in poor light conditions.

DRIVING

- 3 Do not drive if your vision is obscured.
- 4 Ensure the loader arm and head are parked correctly before driving off.
- 5 On, and in the near vicinity of, worksites only cross under energised overhead power lines at designated crossing points that are marked with goalposts (see FISA leaflet 804 *Electricity at work: Forestry*).
- 6 Safe driving distances from energised overhead power lines should be clearly identified by barriers. In many cases marked trees will form a suitable barrier, as long as there is no opening which would allow vehicular access. Consult the electricity company about the use and positioning of barriers. The absolute minimum driving distance from the barriers to the overhead electric line is 6m. The electricity company may advise distances greater than 6m depending on the voltage of the line.
- 7 Avoid driving across felled trees or other timber.
- 8 Where side slopes are unavoidable, extend the loader boom to the uphill side to maintain stability. Ensure the boom does not come into contact with any obstruction.

- 9 Reduce the load when ground conditions are severe. Plan the work so the load can be 'topped up' after negotiating difficult stretches.
- 10 Avoid turning uphill on side slopes.

THE LOADER

- 11 Where the operator is protected by a rollover protective structure (ROPS), falling object protective structure (FOPS) and operator protective structure (OPS), the loader must be regularly inspected to detect wear and tear that may make the equipment unsafe to use. These inspections can be carried out by a trained and competent operator. If the loader is used for lifting in circumstances where either the operator or another person could be injured if the loader suddenly fails then the loader must be thoroughly examined by a competent person at least every 12 months (see INDG290: *A Simple Guide to LOLER*).
- 12 Maintenance must be carried out in accordance with the manufacturer's handbook which should be available.
- 13 Keep a maintenance and inspection record.

LOADING AND UNLOADING

- 14 Ensure the loading or parking brake is on while loading, and that it is released before moving.

- 15 Do not operate the loader if any part of the machine or its load can come within one tree length + the vicinity zone (down to a minimum distance of 15 m) of energised overhead power lines (see *Figure 1*). The vicinity zone will vary between 1m and 5m depending on line voltages (see FISA leaflet 804 *Electricity at work: Forestry*).
- 16 The safe working distances from overhead energised power lines should be clearly identified. Marked trees, high-visibility tape or another suitable marking method should be used as well as organised felling and extraction routes.
- 17 Under normal operating conditions stop work immediately if any person or machine enters the risk zone specified for your machine.
- 18 When loading/unloading on sloping ground, park straight up and down the slope.
- 19 Use convenient stumps or ground obstructions to chock the wheels when loading on slopes.
- 20 Use more than one control at a time to give smooth movement.
- 21 When loading, ensure the grapple jaws fully encircle the load (unless this is a single billet).
- 22 Load the bunk evenly to maximise stability and do not overload it.
- 23 Do not load above the level of the headboard and stanchions/pins.

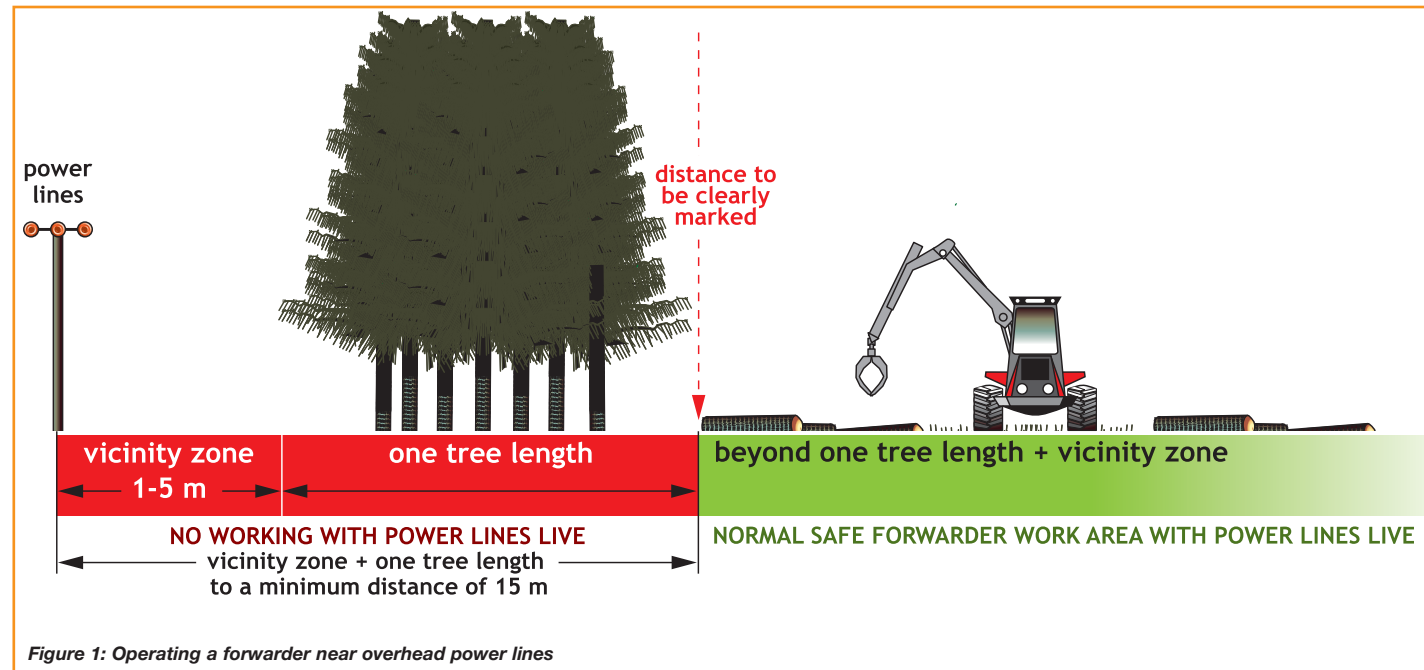


Figure 1: Operating a forwarder near overhead power lines

FURTHER READING

<i>Tractor units in tree work</i>	FISA501
<i>Mechanical roadside processing</i>	FISA605
<i>Emergency planning</i>	FISA802
<i>Electricity at work: Forestry</i>	FISA804
<i>Training and certification</i>	FISA805
<i>Managing Public Safety on Harvesting FC</i> forestry@apsgroup.co.uk	
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<i>A Simple Guide to PUWER</i>	INDG291
<i>A Simple Guide to LOLER</i>	INDG290

These publications are available from the FISA and HSE websites.



Extraction by cable crane

Name:

Checklist verified by:

Date:

Further information

This guide is produced by the Forest Industry Safety Accord (FISA) 59 George Street, Edinburgh, EH2 2JG Tel: 0131 240 1410 Fax: 0131 240 1411 Email: info@ukfisa.com

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This guide sets out evidence of good practice for a specific forestry task. Deviation from the guide should only be considered after a full risk assessment has been undertaken by competent persons. Health and safety obligations **MUST** be met at all times.

THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG504 Extraction by cable crane, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Image courtesy of UPM Tithill

INTRODUCTION

This leaflet covers the use of cable crane systems for the extraction of whole trees, poles or shortwood to the roadside.

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when operating a cable crane system.

This leaflet does not cover a combination of machines working within each other's risk zones (see FISA leaflet 605 *Mechanical roadside processing*).

You must also assess the effect of the site and the weather as well as following this guidance.

All operators must have had appropriate training in how to operate the machine and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

This leaflet **must** be read in conjunction with FISA leaflet 501 *Tractor units in tree work*.

ELECTRICITY

- ❑ 1 Never erect or operate a cable crane system underneath energised overhead electric lines.
- ❑ 2 A safe working distance must be maintained between the cable crane system and any energised overhead electric lines. Consult the electricity company to establish the safe working distance for each set of lines.
- ❑ 3 Never breach the safe working distance(s) given by the electricity company.
- ❑ 4 Never carry a ladder or other long object unless it is carried parallel to and as near the ground as practicable.
- ❑ 5 Never move the cable crane with the tower in the raised position.
- ❑ 6 Stop work and move well clear of the equipment during a thunderstorm because of the risk of lightning strikes.

SAFE WORKING LOADS

- ❑ 7 Cable crane operations fall under the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER). Specific guidance for forestry operations on compliance with LOLER is given in HSE's INDG290: *A Simple Guide to LOLER*.

- ❑ 8 The weight of any load must not exert a force greater than the manufacturer's recommended safe working load on any component in the system. Operators should have enough information to enable them to determine the safe working load for the system, including taking account of the weight of the extended cable and the suitability of anchor points/spar trees.
- ❑ 9 The machine and system must be equipped with ropes and components to the manufacturer's recommended specification, and must be in serviceable condition. All hooks and shackles must be suitably marked with their safe working load.

WIRE ROPES

- ❑ 10 A Test Certificate must accompany the winch ropes when they are purchased and this must be retained.
- ❑ 11 The rope size and lay of the ropes used must be to the winch manufacturer's recommendations. Never attempt to join ropes of different diameters.
- ❑ 12 Sheaves, rollers and other equipment for guiding ropes should be compatible with the dimension of the rope and they should be kept in a serviceable condition to avoid damaging wire ropes.
- ❑ 13 Hauling ropes must be securely fastened to winding drums. At least three full turns should remain on the drums at all times.
- ❑ 14 All ropes should be terminated in a suitable way such as splicing, soft eye loops or swaging – do not use knots.
- ❑ 15 Check daily for visual signs of rope deterioration such as excessive wear, broken wires or strands, distortions and corrosion. Repair or replace broken or damaged ropes without delay.
- ❑ 16 Replace all ropes when their nominal diameter falls below 90% of the original.
- ❑ 17 Broken or badly frayed ropes must be joined by adequate splicing or be replaced. Knots greatly reduce the strength of the ropes and must not be used.
- ❑ 18 Broken or damaged skyline ropes must be repaired at once. The splice must be as long in metres as the actual diameter in millimetres (eg with 13mm skylines the splice must be 13m long). In hauling ropes, a 3m splice is adequate.
- ❑ 19 Damaged or broken anchor ropes must be replaced.

RAISING AND LOWERING THE TOWER

- ❑ **20** Before raising or lowering the tower, check that anchor ropes are secure and any tower support stay bolts are removed.
- ❑ **21** When using a standing tree to help raise or lower the tower, ensure the winch rope is securely attached to the tree at least 2m above the height of the raised tower.
- ❑ **22** When raising or lowering the tower, no one other than the operator should be within range of the tower in a direct line in front of or behind the machine.

MOVING AND POSITIONING THE CABLE CRANE

- ❑ **23** When moving short distances between racks, check there is adequate clearance from obstacles. Take special care near overhead electric or telephone lines. In all other instances lower the tower before moving.
- ❑ **24** Ensure any trailing anchor ropes cannot become fouled on the machine or other obstructions, and that the skyline and polypropylene rope drums are secured.

SETTING UP

- ❑ **25** The cable crane system must be set up in strict accordance with the manufacturer's handbook, which should be available.
- ❑ **26** See HSE leaflet INDG405 *Top Tips for Ladder and Step-Ladder Safety* for guidance on use of ladders.
- ❑ **27** Where there is a risk of falling from the machine, appropriate measures must be taken to ensure operator safety. This can include the use of fall-arrest systems where appropriate.
- ❑ **28** Ensure crossed anchor ropes are rigged in such a way that they will not rub against each other.

ANCHORS

- ❑ **29** Anchor points, whether natural or artificial, must be strong enough to maintain the stability of the unit.
- ❑ **30** Where trees and stumps are used as anchors, ensure they are free of rot, secure and strong enough. Check these regularly, especially after heavy rainfall.
- ❑ **31** When stumps are used as anchor points, ensure they are notched to provide security for the stop.
- ❑ **32** Anchor ropes should be readily adjustable. Terminations in the ropes should be correctly made.

OPERATING THE WINCH

- ❑ **33** The cable crane system must only be operated in accordance with the manufacturer's instructions.
- ❑ **34** All operators must be protected either by machine guarding or by their work position. Consider hazards such as being hit by timber that may be pulled or ejected from the timber stack.
- ❑ **35** The winch operator must work only on agreed signals.
- ❑ **36** Take extreme care when side-hauling close to the tractor. An extra anchor should be placed to oppose the tension when large loads have to be side-hauled close to the tractor.

THE CHOKERMAN

- ❑ **37** The chokerman must keep at least 2m in thinning and 4m in clear fell to the side of the skyline when the wires are in motion.
- ❑ **38** The chokerman must be aware of the possibility of debris falling from adjacent standing timber during the extraction process.
- ❑ **39** Wherever the felling pattern allows, the chokerman must be positioned behind the load or behind standing trees on the same side of the rack during side-hauling.
- ❑ **40** The chokerman must avoid standing under intermediate support wires or their anchor ropes.
- ❑ **41** The chokerman must not attempt to free an obstructed load when the hauling ropes are tensioned.
- ❑ **42** Do not work within the bight of the slack hauling ropes.

COMMUNICATION

- ❑ **43** A suitable form of communication must be in place between all operators working within the system. Radios must not interfere with remote-controlled carriage systems.
- ❑ **44** All radio signals must be prefixed by a call sign, except when sending the 'stop' command in an emergency. All receiving winch operators should obey any such stop signal.
- ❑ **45** Where radio communication is not available, use only the recommended and agreed operating signals (see *Figure 1*).

FELLING AND PROCESSING

- ❑ **31 Do not operate a harvesting unit if wind conditions are such that control over felling direction could be lost.**
- ❑ **32** Operate the machine using the techniques and within the limits specified by the manufacturer's handbook, which should be available.
- ❑ **33** Where appropriate, ensure the parking brake is on, and it is released before moving.
- ❑ **34** Where possible when working on sloping ground, position the machine straight up and down the slope.
- ❑ **35** Do not operate the chainsaw towards the machine cab.
- ❑ **36** Do not point the chainsaw towards any person within 200m, or any greater distance necessary to maintain their safety.
- ❑ **37** Under normal operating conditions, stop work as soon as any person or machine enters the risk zone specified for your machine, or comes closer than two tree lengths plus the length of any boom, whichever is the greater.
- ❑ **38** Do not fell or process trees likely to overload the machine.
- ❑ **39** Leave processed timber in a safe and stable position with safe access for extraction machinery.

WORKING NEAR OVERHEAD POWER LINES

- ❑ **40** Do not fell trees that are **within two tree lengths** of an energised overhead power line without consulting the electricity company and agreeing a safe working procedure (see FISA leaflet 804 *Electricity at work: Forestry*) which incorporates the following precautions:
 - Do not fell any trees if any part of the machine or the tree can come **within one tree length + the vicinity zone** (down to a minimum distance of 15m) of an energised overhead power line. The vicinity zone will vary between 1 and 5m depending on the line voltages.
 - Only fell trees parallel to or away from energised lines.
 - Ensure you use only trained and competent operators with a Forestry Machine Operator Certificate of Competence and electrical awareness training from the electricity company.
 - Assess the weather conditions and ensure the wind direction does not affect control of the felling direction.
 - Agree and instigate a suitable emergency procedure with the electricity company in case of accidental contact or damage to the power lines.
 - Clearly mark the limit of normal working (**two tree lengths**) and the limit of work with the power lines energised (**one tree length + the vicinity zone**). Marked trees, high-visibility tape or another suitable marking method should be used as well as organised felling and extraction routes (see *Figure 1*).

FURTHER READING

<i>Tractor units in tree work</i>	FISA501
<i>Mechanical roadside processing</i>	FISA605
<i>Emergency planning</i>	FISA802
<i>Electricity at work: Forestry</i>	FISA804
<i>Training and certification</i>	FISA805
<i>Managing Public Safety on Harvesting FC</i>	forestry@apsgroup.co.uk
<i>First aid at work: Your questions answered</i>	INDG214
<i>Managing health and safety in forestry</i>	INDG294
<i>Don't lose your hearing</i>	INDG363
<i>Chainsaws at work</i>	INDG317

These publications are available from the FISA and HSE websites.

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Further information

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This guide sets out evidence of good practice for a specific forestry task. Deviation from the guide should only be considered after a full risk assessment has been undertaken by competent persons. Health and safety obligations MUST be met at all times.

THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG603 Mechanical harvesting, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Mechanical harvesting



Image courtesy of UPM/Tihini

INTRODUCTION

This leaflet covers the use of an excavator conversion or purpose-built harvester for felling and processing trees in forestry and other tree work.

It does not cover a combination of machines working within each other's risk zones (see FISA leaflet 605 *Mechanical roadside processing*).

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when mechanically harvesting trees.

You must also assess the effect of the site and the weather as well as following this guidance.

All operators must have had appropriate training in how to operate the machine and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

This guide **must** be read in conjunction with FISA leaflet 501 *Tractor units in tree work*.

THE MACHINE

- ❑ 1 Any risk zone specified by the manufacturer must be clearly and prominently marked on the machine.
- ❑ 2 Harvesting machines which apply stump treatment must have appropriate warning signs fixed to the storage tank.
- ❑ 3 Adequate field lighting must be fitted if working in poor light.

HARVESTER HEAD MAINTENANCE AND REPAIR

- ❑ 4 Ensure the head is maintained according to the manufacturer's handbook, which should be available.
- ❑ 5 Keep a maintenance record.
- ❑ 6 Only trained and authorised personnel should carry out repair and maintenance procedures.
- ❑ 7 Before maintenance or cleaning (eg removal of brash or cleaning of photoelectric cells), park all operational parts of the machine so they are accessible and switch off the engine. Never work under any suspended, unpropped piece of equipment.
- ❑ 8 Ensure all hydraulic pressure in the systems to be maintained or repaired is released before work starts. Where this it is not possible, ease residual pressure by careful slackening of joints.
- ❑ 9 Do not use your hand to check for hydraulic fuel leaks - use a piece of paper or cardboard. Hydraulic fluid under pressure can penetrate the skin. If such contamination occurs seek medical attention at once.
- ❑ 10 If working on a tracked excavator, engage the superstructure slew lock, if fitted.

- ❑ 11 Stand at a safe distance from the head during evaluation of the fault.
- ❑ 12 Isolate as many as possible of the other functions not under investigation.
- ❑ 13 **Avoid working on the head with the engine running. The only task that requires the engine to be running should be hydraulic pressure setting and testing – this requires specialist training and must be undertaken with great care.**
- ❑ 14 If carrying out hydraulic pressure testing, remove the saw bar and chain.
- ❑ 15 Guard exposed cutting edges, ie the knife and saw.
- ❑ 16 During repair and/or fault diagnosis, use any restraints or scotches supplied with the machine according to the manufacturer's instructions.

TO MINIMISE SAW CHAIN BREAKAGE

- ❑ 17 Remove and inspect the cutting equipment at least daily for excessive wear damage. Check particularly for cracked chain parts. Renew the chain as necessary.
- ❑ 18 Ensure all parts of the cutting equipment are properly aligned.
- ❑ 19 Maintain the saw chain, including depth regulators, to the manufacturer's recommendations.
- ❑ 20 Ensure the chain lubrication is effective.

PARKING THE HARVESTING HEAD

- ❑ 21 Ensure the head is parked in a stable position.
- ❑ 22 Ensure the chainsaw is in a guarded position and the knives are closed.

EMERGENCY PROCEDURES

- ❑ 23 Ensure a designated and responsible person knows the daily work programme and agree with them a suitable emergency contact procedure. Where reasonably practicable use a mobile phone or radio and a pre-arranged call-in system.
- ❑ 24 Ensure the operators can provide the emergency services with enough detail for them to be found if there is an accident, eg the grid reference, the distance from the main road, the type of access (suitable for car/four-wheel drive/emergency service vehicles). In urban areas street names are essential. Know the location details before they are needed in an emergency. (Also see FISA leaflet 802 *Emergency planning*).

DRIVING

- ❑ 25 Plan the work so that brash and tops from processed trees assist travel over the worksite.
- ❑ 26 Ensure the harvesting head and boom are parked in the correct transport position before driving off.
- ❑ 27 Where side slopes are unavoidable, extend the harvester boom to the uphill side to maintain stability. Ensure the boom does not come into contact with any obstruction.
- ❑ 28 Avoid driving across felled trees and other timber.
- ❑ 29 On and in the near vicinity of worksites, only cross under energised overhead power lines at the designated crossing point(s) that are marked with goalposts.
- ❑ 30 Safe driving distances from energised overhead power lines should be clearly identified by barriers. In many cases, marked trees will form a suitable barrier, as long as there is no opening which would allow vehicular access. Consult the electricity company about the use and positioning of barriers. The absolute minimum driving distance from the barriers to the overhead power line is 6m. The electricity company may advise distances greater than 6m depending on the voltage of the line.

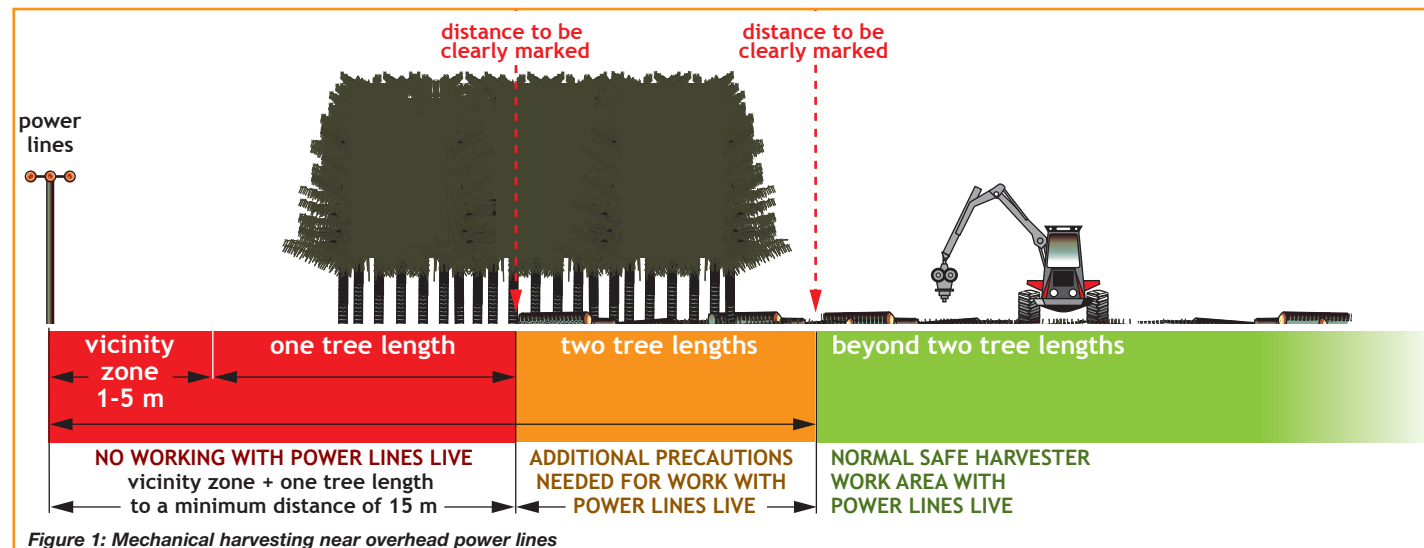


Figure 1: Mechanical harvesting near overhead power lines

INTRODUCTION

This leaflet covers the safe working practices to be adopted when carrying out mechanical roadside processing in forestry and other tree work.

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when carrying out extraction of whole trees or poles to roadside and subsequent mechanised conversion. During this process two or more machines may be working within each other's designated risk zones.

This guide must be read in conjunction with FISA leaflet 501 *Tractor units in tree work*, and, depending on the operation, FISA leaflets 502 *Extraction by skidder*, 503 *Extraction by forwarder*, 504 *Extraction by cable crane* and 603 *Mechanical harvesting*.

You must also assess the effect of the site and the weather as well as following this guidance.

All operators must have had appropriate training in how to operate the machine and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

GENERAL ADVICE

- 1 All operators must be protected either by machine guarding or by work position from hazards such as being injured by chainshot, hit by timber or crushed by the machinery.
- 2 You must take additional precautions to reduce the likelihood of chainshot. Pre-assembled chain loops must be used and more frequent inspection of the chain and bar undertaken than during normal processing within the wood (see FISA leaflet 603 *Mechanical harvesting*).
- 3 An efficient form of communication must be in place between all operators working within the mechanised system. The use of horns or klaxons to warn all operators to stop work should be considered. Radios should only be used if they do not interfere with remote-controlled systems.
- 4 All personnel entering the site should wear high-visibility clothing and notify the operator before approaching the machine, always avoiding the risk zone.

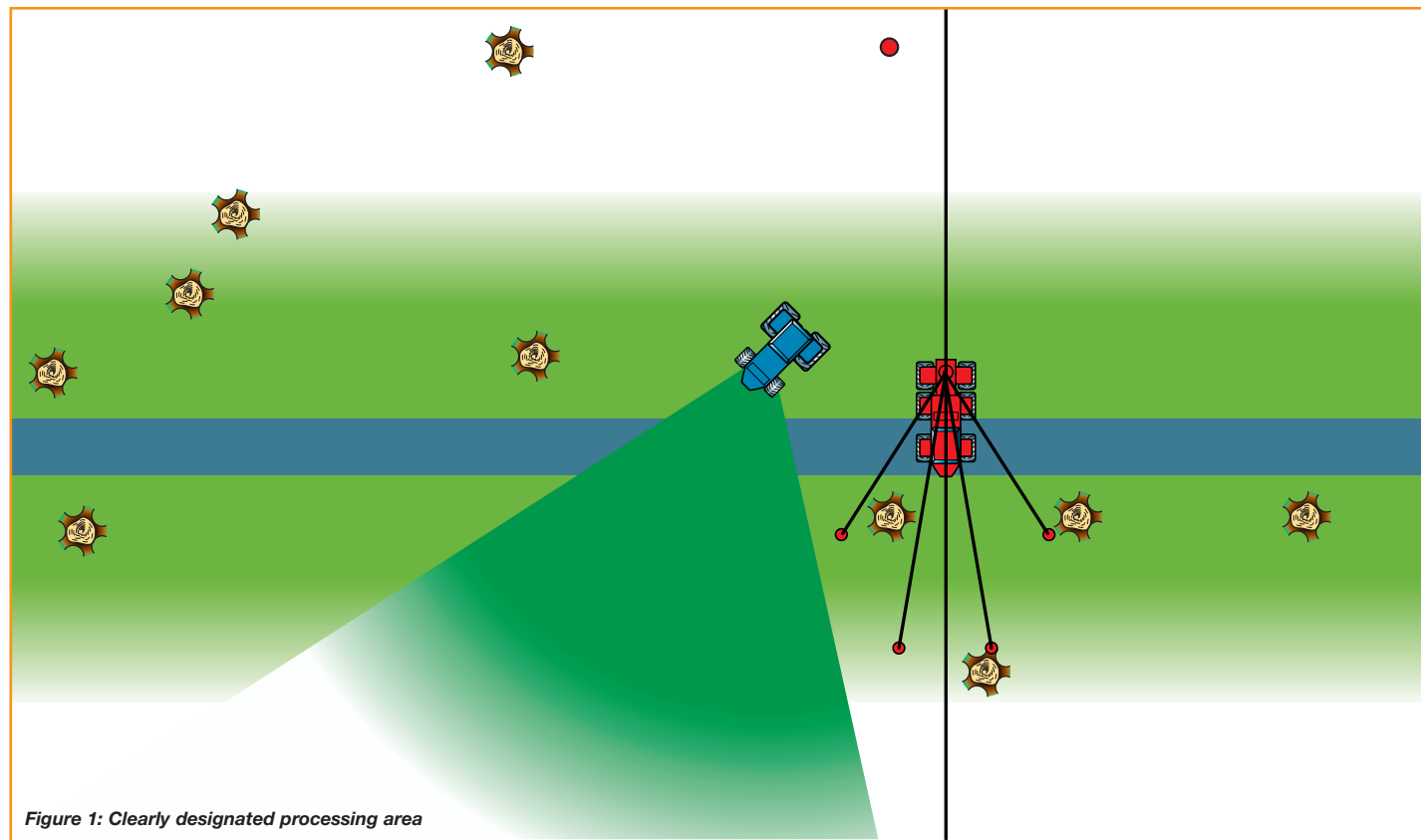


Figure 1: Clearly designated processing area

EMERGENCY PROCEDURES

- 5 Ensure a designated and responsible person knows the daily work programme and agree with them a suitable emergency contact procedure. Where reasonably practicable use a mobile phone or radio and a pre-arranged call-in system.
- 6 Ensure the operators can provide the emergency services with enough detail for them to be found in the event of an accident, eg the grid reference, the distance from the main road, the type of access (suitable for car/four-wheel drive/emergency service vehicles). In urban areas street names are essential. Know the location details before they are needed in an emergency. (Also see FISA leaflet 802 *Emergency planning*.)

SITE ORGANISATION

- 7 The operation must be planned to ensure all processing is carried out in a direction away from operators and machinery. A clearly designated processing area should be identified (see Figure 1).

CABLE CRANE/PROCESSOR

- 8 Processing must stop when the cable crane operator is outside the protected cab/guarding/agreed working position.
- 9 The processor must be positioned so that it does not work under any ropes.
- 10 The processing unit must not process in a way that obstructs either the view of the cable crane operator or the passage of timber.
- 11 The maximum achievable distance between the cable crane and processor units should be maintained at all times, taking into account the size and weight of produce being moved and the stability of the processing unit.

FURTHER READING

<i>Tractor units in tree work</i>	FISA501
<i>Excavators in tree work</i>	FISA704
<i>Emergency planning</i>	FISA802
<i>Electricity at work: Forestry and arboriculture</i>	FISA804
<i>Training and certification</i>	FISA805
<i>Safe use of rotary flail hedge cutters</i>	AIS21
<i>Safe use of agricultural mowers</i>	AIS25
<i>Power take-offs and power take-off drive shafts</i>	AIS24
<i>First aid at work: Your questions answered</i>	INDG214
<i>Managing health and safety in forestry</i>	INDG294
<i>Don't lose your hearing</i>	INDG363
<i>DTLR Code of Practice:</i>	
<i>Safety at street works and road works</i>	011 551958 0

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THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG204 Flails and mulchers in tree work, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Flails and mulchers in tree work



Image courtesy of Forestry Commission Picture Library

INTRODUCTION

This leaflet covers the safe working practices to be followed when operating front-, rear- or arm-mounted flails and mulchers in forestry and other tree work. The flail or mulcher may be part of a purpose-built machine or mounted on and powered by a tractor, excavator or other suitable base vehicle.

You can use this leaflet, along with the machine and base vehicle manufacturer's handbooks, as part of the risk assessment process to help identify the controls to put in place when using a flail or mulcher.

Where the base vehicle is a tractor or excavator, this leaflet must be read in conjunction with FISA leaflet 501 *Tractor units in tree work*, or FISA leaflet 704 *Excavators in tree work*.

You must also assess the effects of the site conditions and the weather as well as following this guidance.

All operators must have had appropriate training* in how to operate the machine and base vehicle as well as how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

PERSONAL PROTECTIVE EQUIPMENT (PPE)

❑ 1 Use the following PPE:

- Safety helmet (complying with EN 397) when the risk assessment identifies that it is needed.
- Suitable hearing protection (complying with EN 352) where the noise level exceeds 80 dB(A) (see INDG363 *Don't lose your hearing*).
- Suitable protective gloves when inspecting or carrying out maintenance on the flail or handling oils, lubricants and hydraulic components.
- Protective boots with good grip and ankle support (complying with EN ISO 20345).
- Suitable eye protection (complying with EN 166) for use during maintenance and when the risk assessment identifies that it is needed.
- Suitable respiratory protective equipment (eg disposable dust mask complying with EN 149 and FFP2 filter or equivalent) when the risk assessment identifies that it is needed.
- Non-slag outer clothing appropriate to the prevailing weather conditions. High-visibility clothing (complying with EN 471) should be worn when the risk assessment identifies that it is needed.

❑ 2 A suitable first-aid kit, including a large wound dressing, should be available in the base vehicle (see HSE leaflet INDG214 *First aid at work: Your questions answered*).

- ❑ 3 Hand-cleaning material such as waterless skin cleanser or soap, water and paper towels should be readily available.
- ❑ 4 You should have available and know how to use an emergency kit for spills of fuel, oil or chemicals.

GENERAL ADVICE

- ❑ 5 On all reasonably foreseeable approaches to the worksite, erect warning and prohibition signs conforming to the Health and Safety (Safety Signs and Signals) Regulations 1996, indicating a hazardous worksite and that unauthorised access is prohibited. In areas of very high public access, your risk assessment may indicate that additional controls (eg barrier tape, barriers, extra manning, operating with all working lights on etc) are required.
- ❑ 6 Working on public highways should be in accordance with Department of Transport (DoT) and Local Highways Authority (LHA) guidelines. The LHA should be notified of the time and location of the intended work and the correct warning signs as specified by the DoT. Non-authorised placement of road signs may create offences under the Highways Act.
- ❑ 7 Base vehicles will need to be fitted with an operator protective structure (OPS) designed to minimise the risk of injury from flying debris entering the cab. OPSs may take the form of a framework with mesh grills, safety glazing or polycarbonate. The risk assessment will determine the level of protection required. OPS design should take account of the operator's need for good allround visibility. Doors and windows should not be removed from the base vehicle.
- ❑ 8 Use of a flashing warning beacon is recommended when carrying out work from, or moving between sites on, public roads.

THE MACHINE

- ❑ 9 Before starting the job, assess what sort of work is being carried out so that you can identify the most suitable type of flail/mulcher.
- ❑ 10 Check that the weight of the machine does not exceed the maximum load for the front or rear axles and tyres of the base vehicle. Use counterbalance weights or ballast where necessary.
- ❑ 11 If the machine is powered by the base vehicle's hydraulic system ensure the hydraulic capacity is adequate for the type of flail/mulcher being used.

* A relevant NPTC Forest Machine Operator Certificate Scheme (FMOCS) qualification should be obtained for the tractor or other base unit being used. An FMOCS qualification is also available for the use of mechanical flails.

- ❑ **12** If the machine is powered by the base vehicle's power takeoff (PTO) shaft, ensure:
 - the PTO speed is compatible with the flail/mulcher and the PTO shaft;
 - the PTO shaft is fitted with a suitable guard (complying with BS EN ISO 5674) enclosing the shaft along its full length, from the base vehicle to the flail (see AS24 *Power take-offs and power take-off drive shafts*).
- ❑ **13** All pulleys, belts, drive shafts and blades must be guarded.
- ❑ **14** Safety devices (eg shearbolts, pressure-relief valves, PTO torque clutches and belts) should be fitted in accordance with the manufacturer's handbook.
- ❑ **15** Front- or rear-mounted flails/mulchers must be fitted with cutting height adjustment and a pusher bar to prevent tall, woody material falling onto the base vehicle cab.
- ❑ **16** Arm-mounted flails/mulchers will require the base vehicle's side window/door to be guarded in accordance with the manufacturer's instructions.
- ❑ **17** Additional guarding may be required for certain forestry operations (eg deflector plates to prevent debris from flying into the front or rear of the base vehicle). This should be fitted in accordance with the manufacturer's instructions.
- ❑ **18** All relevant safety/warning decals should be in position on the flail.

MAINTENANCE

- ❑ **19** Ensure maintenance is carried out by a competent person, in accordance with the manufacturer's handbook and meets the requirements of the Provision and Use of Work Equipment Regulations 1998.
- ❑ **20** Before opening any guards make sure the engine is switched off, the start key removed, and the dangerous moving parts have come to a complete standstill. Heavier rotors may run down very silently and take a long time to stop.
- ❑ **21** Check all cutting devices for damage, and sharpen or replace if necessary. If damaged or worn, replace as a complete set/pair to maintain balance. Check the condition and tightness of securing bolts.
- ❑ **22** Do not support the flail/mulcher by hydraulics alone – use suitable and secure props or stands.
- ❑ **23** Ensure all hydraulic pressure in the systems to be maintained or repaired is released before work starts. Where this it is not possible, ease the residual pressure by careful slackening of joints.

- ❑ **24** Always use two spanners to refit a pipe or hose to avoid twisting the hose.
- ❑ **25** Do not use your hand to check for hydraulic leaks – use a piece of paper or cardboard. Hydraulic fluid under pressure can penetrate the skin. If such contamination occurs seek medical attention at once.
- ❑ **26** Inspect for cracks and other damage.
- ❑ **27** Keep a maintenance record.

PREPARING TO WORK

- ❑ **28** Before starting work the operator should carry out a sitespecific risk assessment. Where appropriate, the area to be worked should be walked to identify any hidden obstacles or variability of ground level. Particular care should be taken when operating close to wire fences, as discarded material may be lying in the undergrowth.
- ❑ **29** When preparing to operate along roadsides, check for the presence of above-ground utilities such as poles (and pole stays), water hydrants, telecom boxes etc.
- ❑ **30** Do not operate arm- or excavator-mounted machines, capable of exceeding 4.2 m in height, if any part can come within 15 m of overhead electric power lines, unless it has been established that the line voltage does not exceed 33 kV, in which case this distance may be reduced to 9 m (see FISA leaflet 804 *Electricity at work: Forestry and arboriculture*). Any machine used to clear standing trees/plants of over 4.2 m in height will need to follow the guidance for tree-felling operations contained in FISA leaflet 804.
- ❑ **31** A sign warning against working in the vicinity of overhead electric power lines should be prominently displayed (in all machines capable of exceeding 4.2 m in height), together with the maximum height of the machine and the maximum height in the recommended travelling position.
- ❑ **32** Set up an appropriate risk zone around the area being worked.
- ❑ **33** A suitable method of working should be set up and followed to minimise the risk of:
 - instability of the base vehicle and flail/mulcher, particularly when working on sloping ground;
 - cut debris being discharged into watercourses;
 - damage to buildings, vehicles and other amenities from discharged material;
 - any contact with power lines.

EMERGENCY PROCEDURES

- ❑ **34** Ensure a designated and responsible person knows the daily work programme and agree with them a suitable emergency contact procedure. Where reasonably practicable, use a mobile phone or radio and a pre-arranged call-in system.
- ❑ **35** Ensure the operators can provide the emergency services with enough detail for them to be found if there is an accident, eg the grid reference, distance from the main road, type of access (suitable for car/four-wheel-drive/emergency service vehicles). Know the location details before they are needed in an emergency (also see FISA leaflet 802 *Emergency planning*).

OPERATIONAL PROCEDURE

- ❑ **36** The flail/mulcher should only be operated from within the cab of the base vehicle.
- ❑ **37** Ensure that 3-point-linkage-mounted flails/mulchers are balanced and level before starting work.
- ❑ **38** Select a gear and speed that is appropriate to the recommended PTO shaft speed, ground conditions and vegetation.
- ❑ **39** Look out for obstructions and hazards in the path of the base vehicle and flail/mulcher.
- ❑ **40** The flail/mulcher should be run at the highest position that will give the desired cutting result. Two passes may be necessary in dense vegetation.
- ❑ **41** Where possible, excavator-based flails/mulchers should be operated using a slewing motion, with the head at right angles to the operator's cab, so that debris is not directed towards cab windows or the vehicle. If it is necessary to operate the head in line with the cab then:
 - cutting should always be away from the operator;
 - an adjustable debris deflector plate must be fitted;
 - a suitable cab operator protective structure must be fitted; and
 - the head should not be operated above the level of the cab.
- ❑ **42** Stop work and disengage the PTO or drive to the machine immediately if any part of the flail/mulcher becomes loose or is damaged.
- ❑ **43** Stop work if anyone is seen approaching within the risk zone identified in the risk assessment.
- ❑ **44** Do not leave the base vehicle cab until the cutting head has stopped rotating and has been lowered to the ground.

OBSTACLES

- ❑ **45** When an obstacle is encountered:
 - stop the flail/mulcher immediately;
 - reverse to disengage the obstacle;
 - where possible do not lift the cutting head until it is completely stationary.
- ❑ **46** Stop immediately if unusual vibration occurs.
- ❑ **47** Reduce speed when using forward-mounted flails/mulchers as visibility may be restricted.

FLYING DEBRIS

- ❑ **48** Extend the risk zone or adjust working methods when operating on undulating ground.
- ❑ **49** Reduce the risk of flying debris by:
 - working at a slower speed;
 - making two or more passes over a work area.
- ❑ **50** When operating arm-mounted flails be aware of higher flying debris.
- ❑ **51** Be aware of the risk of flying debris when 'breaking out' into open spaces, eg roads, pathways, rides etc.

AFTER WORK

- ❑ **52** Ensure arm-mounted machines are folded close to the kingpost and secured in the transport position. Be aware of low bridges, gate widths, overhead electric cables etc.
- ❑ **53** Ensure the load is secure and people are in a safe position before moving off.
- ❑ **54** When transporting on public highways obey all relevant highway laws.

FURTHER READING

Using petrol-driven chainsaws
Tractor units in tree work
Extraction by skidder
Extraction by forwarder
ATV quad bikes
All-terrain vehicles
Emergency planning
Electricity at work: Forestry
Training and certification
First aid at work: Your questions answered
Don't lose your hearing

FISA301
FISA501
FISA502
FISA503
FISA701
FISA702
FISA802
FISA804
FISA805
INDG214
INDG363

These publications are available from the FISA and HSE websites.

Winching operations in forestry
(FC Technical Guide FCTG001)

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Checklist verified by:

Date:

Further information

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59 George Street, Edinburgh, EH2 2JG Tel: 0131 240 1410
Fax: 0131 240 1411 Email: info@ukfisa.com

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THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG703 *Debogging and recovery of forestry machines*, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Debogging and recovery of forestry machines



Image courtesy of UPLV Tihill

FISA Safety Guide 703

INTRODUCTION

This leaflet covers the safe working practices to be followed when recovering machines that have become bogged down during forestry and other tree work.

You can use this leaflet, along with the machine and equipment manufacturer's handbook(s), as part of the risk assessment process to help identify the controls to put in place when recovering or debogging machines.

For guidance on using chainsaws during recovery operations see FISA leaflet 301 *Using petrol-driven chainsaws*. When using quad bikes and ATVs see FISA leaflets 701 *ATV quad bikes* and 702 *All-terrain vehicles*. For use of wire-handling safety gloves see FISA leaflet 104 *Fencing*. When working near power lines, see FISA leaflet 804 *Electricity at work: Forestry*.

All operators must have had appropriate training in how to operate the equipment and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

For further information see FC Technical Guide: *Winching operations in forestry*, which includes information on how to calculate winch forces.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- ❑ 1 Use the following PPE:
 - Safety helmet (complying with EN 397), if identified as required by the risk assessment.
 - Hearing protection (complying with EN 352), where the noise levels exceed 85 dB(A) (see HSE pocket card INDG363 *Don't lose your hearing*).
 - Eye protection (a mesh visor to EN 1731 or safety glasses to EN 166).
 - Suitable protective gloves when handling materials such as fuel, ropes or chemicals.
 - Protective boots with good grip and ankle support (complying with EN 20345).
 - Non-slag outer clothing appropriate to the prevailing weather conditions. High-visibility clothing (complying with EN 471) should be worn when the risk assessment identifies that it is needed.
- ❑ 2 A first-aid kit should be available in site vehicles, however personal first-aid kits including a large wound dressing should be carried if working away from the vehicles (see HSE leaflet INDG214 *First aid at work: Your questions answered*).
- ❑ 3 Hand-cleaning material such as waterless skin cleanser or soap, water and paper towels should be readily available.

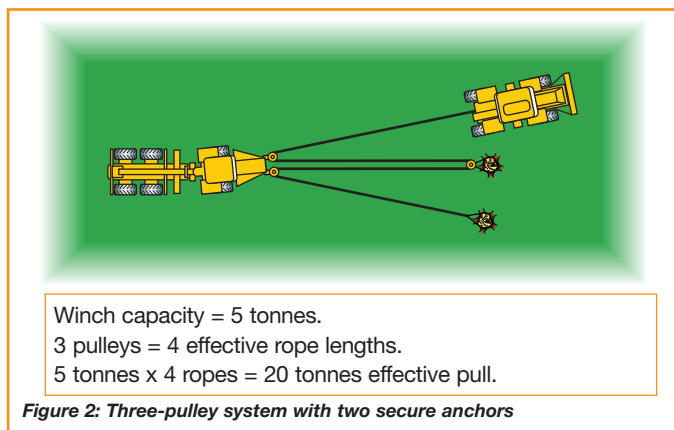
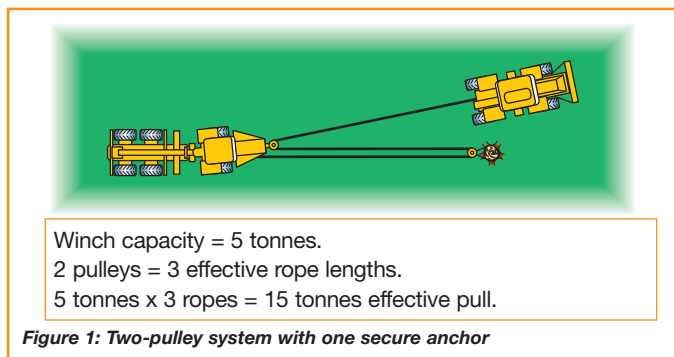
GENERAL ADVICE

- ❑ 4 Plan travelling routes and avoid, or thatch, any wet or rutted areas. If in doubt, use an alternative route where available and be prepared to stop work if the site becomes too wet.
- ❑ 5 When traction is lost, stop the machine sooner, rather than later. The deeper you are bogged in, the greater the forces needed for recovery and as a result the greater the risk of injury, equipment failure or damage.
- ❑ 6 If a machine becomes bogged the operator should do the following:
 - Stop all drive to tracks and/or wheels.
 - Make the machine safe.
 - Dismount the machine safely (eg climb off it on the high side when on a slope, if practicable).
 - Assess the situation. Advise the 'site safety co-ordinator' and arrange for any assistance that is required.
 - Consider anything that may help with recovery (eg partial or full unloading).
 - Consider emergency drainage, if safe to do so, where the engine or its components may be damaged by ponded water.
- ❑ 7 An emergency pollution kit should be available for spills of fuel, oil or chemicals.

EQUIPMENT

- ❑ 8 Inspect equipment in accordance with the manufacturer's instructions. Always check for damage or 'end of life' condition before use. Destroy and discard equipment that is not serviceable.
- ❑ 9 Ensure all ropes/cables, strops, hooks, eyes, shackles and winches are compatible with each other and suitable for the intended operation.
- ❑ 10 Ensure all the debogging components, eg pulleys, shackles, hooks and strops have their safe working load (SWL) clearly marked. Keep a certificate (or copy) with the debogging kit stating the SWL of the wire ropes. Ensure any safety devices such as shear pins are correctly fitted.
- ❑ 11 Check that all components of the debogging system and all other necessary aids such as tool kits are present before starting a recovery or debogging operation.
- ❑ 12 The debogging system set-up must be able to safely generate enough force to move the weight of the machine plus any other calculated factors such as rolling resistance, gradient resistance and locked wheel resistance. Examples may be calculated to determine the force required for typical scenarios but an on-site calculation should be made once all factors have been assessed.

- 13 Do not exceed the SWL of the set-up under any circumstances. Where necessary use appropriate calculations to ensure this does not happen (see Forestry Commission Technical Guide FCTG001 *Winching operations in forestry*). Note that the use of multiple pulley set-ups can expose components to loading greater than the rated capacity of the winch (see *Figures 1 and 2*). Load monitoring devices can be used in the system where load assessment is difficult to establish.



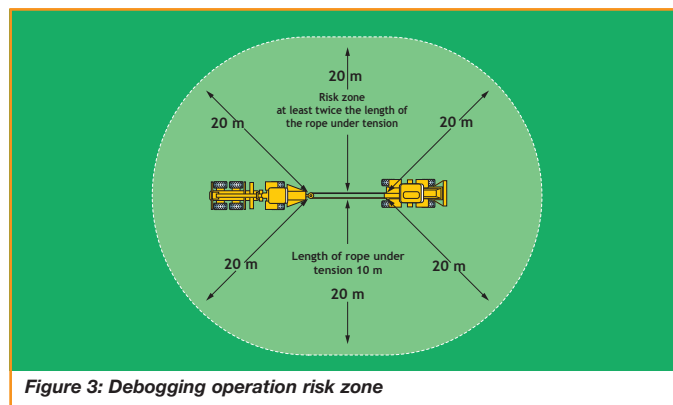
WIRE ROPES

- 14 The rope size and lay must be to the winch manufacturer's recommendations. Do not join ropes of different diameters.
- 15 Hauling ropes must be securely fastened to the winch drums. At least three full turns should remain on the drum at all times.
- 16 All ropes should be terminated in a suitable way, eg splicing, soft eye loops or swaging – do not use knots.
- 17 Check ropes for signs of wear and tear, eg broken wire, distortions and corrosion. Repair or replace broken or damaged ropes before further use. Any joins in the rope must be made using a suitable splice, or the rope should be replaced.

- 18 Replace ropes when their nominal diameter falls below 90% of the original. BS ISO 4309: 2004 provides information on the examination, maintenance and discard criteria for wire ropes.

RISK ZONES

- 19 During winching a risk zone of twice the length of the rope under tension should be set up (see *Figure 3*).



- 20 Powered winch operators and drivers working within the risk zone must have suitable operator protection fitted to the cab (eg wire mesh screens, polycarbonate windows). All other staff with certain exceptions (see *paragraph 23*), should be outside the risk zone when the rope is under tension.
- 21 The debugging risk zone must not be confused with the safety distances described for working near overhead power lines. Always observe the power line safety distances and work outside the risk zone for ropes under tension.
- 22 Do not operate a machine if any part of the debugging/recovery operation can come within a minimum of 15m of energised overhead power lines. If any part of a machine or equipment can come within this distance, then the Distribution Network Operator (DNO) must be consulted and a safe working procedure agreed. Take into account the risk that any tree used as an anchor could fall onto a power line and ensure safety distances are set accordingly (see FISA leaflet 804 *Electricity at work: Forestry*).
- 23 Operators using manually powered winches and some types of remote-control winches (eg electrically powered winches and capstan winches) where the controls are located outside a protected cab, need to take special precautions when working within the risk zone, including the following:
 - Do not use ropes or slings that have high stretch characteristics, because energy stored in them when they are stretched can be released during equipment failure, causing 'whiplash'.

- Offset the winch where possible, so that the operator is not standing in line with the direction of pull. Do not stand within the angle formed by a rope passing through a guide or pulley during offset winching.
- If no offset can be rigged, avoid standing directly in line with the line of pull.

- ❑ **24** Risk zones will need to be increased to include any trees or back anchors that are incorporated into the winching operation (trees that break or are uprooted can fall in any direction).

EMERGENCY PROCEDURES

- ❑ **25** Ensure a designated and responsible person knows the daily work programme and agree with them a suitable emergency contact procedure. Where reasonably practicable use a mobile phone or radio and a pre-arranged call-in system.
- ❑ **26** Ensure the operators can provide the emergency services with enough detail for them to be found in the event of an accident, eg the grid reference, the distance from the main road, the type of access (suitable for car/four-wheel-drive/emergency service vehicles). In urban areas street names are essential. Know the location details before they are needed in an emergency (see FISA leaflet 802 *Emergency planning*).

SETTING UP

- ❑ **27** Before setting up, a 'site-specific' risk assessment must be carried out to identify on-site hazards and specify the necessary controls. The assessment will need to include standing/damaged trees and ground conditions, machine conditions, and manual handling of debogging equipment.
- ❑ **28** Assess the position of the machine to be recovered and whether it is carrying a hazardous load such as pesticide or diesel. Incorporate the necessary controls in the risk assessment.
- ❑ **29** Reduce the weight of the machine to be debogged or recovered by unloading or releasing the load where it is safe to do so.
- ❑ **30** Where appropriate, dig out wheels in the direction of pull to reduce as far as possible the force required to break out the vehicle.
- ❑ **31** Calculate the force required to recover or debog the machine. Once the force has been determined the equipment and set-up can be assessed and implemented.
- ❑ **32** Select suitable anchorage points and ensure recovery operators are in a safe position when operating winches and machines. If pulling directly with another vehicle, select secure attachment points on each machine.
- ❑ **33** Trees, stumps or other anchors used to secure the winch and/or pulley blocks must be assessed and reinforced where necessary. Risk zones may need to be increased to accommodate these.

- ❑ **34** Attachment to the anchor point should always be with an appropriately rated strop to prevent damage to and weakening of the wire winch rope.
- ❑ **35** The strops and pulley blocks should be set up so that the winch has a straight pull on its anchor point.
- ❑ **36** The winch cable should be free from obstruction and abrasion and in a direct line to the winch or to an intermediate pulley.

OPERATION

- ❑ **37** One person should be in charge of the operation.
- ❑ **38** Where two people are involved in the operation, both should wear high-visibility clothing and have an agreed communication and signalling procedure in place. In all instances personnel not within a protective cab should be outside the risk zone, except for operators of manually powered winches and some remote-controlled winches.
- ❑ **39** When pulling a machine on sloping ground, never pull from directly below, always offset.
- ❑ **40** Winch and machine operators should remain in the safety cabs of their machines when the wire rope is under tension.
- ❑ **41** During manual recovery with a hand-operated winch, ensure the correct safety device is used, eg the correct shear pins or operating handle.
- ❑ **42** Identify an agreed escape route before the operator uses a hand-operated winch.
- ❑ **43** If the bogged machine will not move, then reassess the situation to recalculate forces and reconfigure the set-up.
- ❑ **44** All staff, apart from the machine operators and operators of manually powered winches or some remote-controlled winches, must remain outside the risk zone (see *Figure 3*) during winching. Operators in the machine cabs must be protected by approved safety cab structures fitted with safety glass or mesh.

AFTER RECOVERY

- ❑ **45** Ensure all vehicles used in recovery are in a stable and safe condition. Ensure machines are not adversely affected by water and/or mud. If a machine has been involved in an overturn, it should be checked by a mechanic before it is started.
- ❑ **46** Clean and check the condition of all equipment after use and store correctly.
- ❑ **47** Tape off the affected part of the route to prevent a repeat incident. Make sure all other drivers are informed.

FURTHER READING

<i>Flails and mulchers in tree work</i>	FISA204
<i>Extraction by cable crane</i>	FISA504
<i>Mechanical harvesting</i>	FISA603
<i>Mechanical roadside processing</i>	FISA605
<i>Emergency planning</i>	FISA802
<i>Electricity at work: Forestry</i>	FISA804
<i>Training and certification</i>	FISA805
<i>A simple guide to PUWER</i>	INDG291
<i>A simple guide to LOLER</i>	INDG290
<i>Managing Public Safety on Harvesting FC</i>	forestry@apsgroup.co.uk
<i>First aid at work: Your questions answered</i>	INDG214
<i>Managing health and safety in forestry</i>	INDG294
<i>Don't lose your hearing.</i>	INDG363

These publications are available from the FISA and HSE websites.



Excavators in tree work

Name:

Checklist verified by:

Date:

Further information

This guide is produced by the Forest Industry Safety Accord (FISA)
59 George Street, Edinburgh, EH2 2JG Tel: 0131 240 1410
Fax: 0131 240 1411 Email: info@ukfisa.com

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This guide sets out evidence of good practice for a specific forestry task. Deviation from the guide should only be considered after a full risk assessment has been undertaken by competent persons. Health and safety obligations MUST be met at all times.

THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG704 Excavators in tree work, which was withdrawn in 2013. For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Image courtesy of Forestry Commission Picture Library

FISA Safety Guide 704

INTRODUCTION

This leaflet covers the safe working practices to be followed when operating tracked 360° excavators and walking excavators in forestry and other tree work. For guidance on specific operations involving excavator base units see FISA leaflets 204 *Flails and mulchers in tree work*, 504 *Extraction by cable crane*, 603 *Mechanical harvesting*, and 605 *Mechanical roadside processing*.

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when operating excavators in the forest.

You must also assess the effect of the site conditions and the weather as well as following this guidance.

All operators must have had appropriate training in how to operate the machine* and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- ❑ 1 Use the following PPE:
 - Safety helmet (complying with EN 397) when the risk assessment identifies that it is needed.
 - Suitable hearing protection (complying with EN 352) where the noise level exceeds 80 dB(A) (see INDG363 *Don't lose your hearing*).
 - Suitable protective gloves when handling materials such as fuel, ropes or chemicals.
 - Protective boots with good grip and ankle support (complying with EN ISO 20345).
 - Non-slag outer clothing appropriate to the prevailing weather conditions.
 - High-visibility clothing (complying with EN 471) should be worn when the risk assessment identifies that it is needed.
- ❑ 2 A suitable first-aid kit, including a large wound dressing, should be available in the base vehicle (see HSE leaflet INDG214 *First aid at work: Your questions answered*).
- ❑ 3 Hand-cleaning material such as waterless skin cleanser or soap, water and paper towels should be readily available.
- ❑ 4 You should have available and know how to use an emergency kit for spills of fuel, oil or chemicals.

GENERAL

- ❑ 5 All risk zones specified by the machine manufacturer must be clearly and prominently marked on all machines. This will normally be twice the maximum reach of the boom. In addition the risk zone may need to be increased depending on the attachment being used (eg harvesting operations or debris ejected from flails etc).
- ❑ 6 A sign warning against working in the vicinity of overhead electric power lines must be prominently displayed in all machines, together with the maximum height of the machine and the maximum height in the recommended (non-operational) travelling position.
- ❑ 7 When the machine is used in a lifting operation the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) will apply. In some cases (eg cable crane operations or lowering culvert pipes) the excavator may need to have a current certificate of thorough examination in accordance with the Regulations (see HSE Information sheet INDG290: *A simple guide to LOLER*).
- ❑ 8 The machine operator is at particular risk from falls during onsite maintenance and refuelling operations. Ensure suitable means of access and safe working positions have been established.

THE MACHINE

- ❑ 9 Before work starts, an assessment should be carried out to identify the suitability of the machine in relation to the site and the task to be undertaken.
- ❑ 10 The features of the machine to be considered should include:
 - stability and floatation – track length and width;
 - traction – grouser height and frequency;
 - ground clearance – raised undercarriage;
 - machine guarding – to prevent damage to pipework/ components during the operation;
 - poor light conditions – adequate lighting must be fitted.
- ❑ 11 The risk assessment should identify what levels of operator protection are required on the machine. Consider:
 - operator protective structures (OPS) – in the form of guarding (eg bars/mesh/polycarbonate glazing), to prevent harvesting residues etc entering the cab;
 - falling object protective structures (FOPS) – in the form of a frame/deflectors surrounding the cab to prevent falling objects striking and entering the cab;
 - roll-over protective structures (ROPS) – where there is a risk of the machine overturning.

*A relevant NPTC Forest Machine Operator Certificate Scheme (FMOCS) qualification should be obtained for the type of excavator work being undertaken.

PREPARING TO WORK

- ❑ **12** Ensure information has been provided about all worksite hazards identified in the risk assessment, and the control measures are fully understood.
- ❑ **13** Check the worksite for underground and overhead hazards and services, eg electricity cables, phone lines, water and gas mains. Where present, ensure they are clearly marked and provide suitable crossing points if necessary.
- ❑ **14** Many excavator operations involve working in isolation. This must be addressed as part of the site risk assessment and an agreed lone-working procedure followed, eg a call-in or buddy system.
- ❑ **15** Select routes that are within the machine's and driver's capabilities.
- ❑ **16** When using walking excavators also consider:
 - identifying suitable access and egress points before work starts;
 - identifying potential obstructions and hazards, eg harvesting residue that may need treatment before work starts;
 - identifying any shallow soil, loose ground surfaces or large obstacles that can affect machine stability;
 - assessing and controlling the risk of objects being disturbed by the walking excavator and rolling downhill onto any work/access routes/footpaths etc below the worksite.

EMERGENCY PROCEDURES

- ❑ **17** Ensure a designated and responsible person knows the daily work programme and agree with them a suitable emergency contact procedure. Where reasonably practicable, use a mobile phone or radio and a pre-arranged call-in system.
- ❑ **18** Ensure the operators can provide the emergency services with enough detail for them to be found if there is an accident, eg the grid reference, distance from the main road, type of access (suitable for car/four-wheel-drive/emergency service vehicles). Know the location details before they are needed in an emergency (also see FISA leaflet 802 *Emergency planning*).

OPERATING

- ❑ **19** Carry out pre-start checks in accordance with the manufacturer's handbook. Ensure safety guards and attachments are securely fixed in position.
- ❑ **20** Use the steps and handholds provided to enter and leave the machine.

- ❑ **21** Ensure nobody is in the immediate vicinity when the equipment is started.
- ❑ **22** Before operating the travel levers, ensure you know in which direction the machine is pointing.
- ❑ **23** Use extreme caution when reversing or slewing. Be sure there is a clear path around the machine.
- ❑ **24** Keep any attachment as close as possible to the ground.
- ❑ **25** Do not operate the machine if any part of it, or its load, can come within 15 m of overhead electric power lines unless it has been established that the line voltage does not exceed 33 kV, in which case this distance may be reduced to 9m (see FISA leaflet 804 *Electricity at work: Forestry*). A different approach to safety distances is required during extraction by cable crane, mechanical harvesting or mechanical roadside processing (see relevant FISA leaflets).
- ❑ **26** When using walking excavators, ensure the wheels and legs are set as wide as possible to maintain stability. The cab should be kept as level as possible.
- ❑ **27** Be aware that the weather conditions may affect the machinehandling characteristics.
- ❑ **28** Be aware of the limitations of the machine on slopes, soft ground and other major obstacles.
- ❑ **29** Wherever possible, localised obstacles such as harvesting residue, stumps, rocks etc should be moved or avoided to allow safe operation and travel. On steep ground do not allow this material to roll where it may be hazardous to anyone below.
- ❑ **30** If the machine begins to slide or becomes unstable, lower the attachment onto the ground as quickly as possible.
- ❑ **31** Do not attempt to jump clear of an overturning machine – sit tight and stop the engine.

PARKING THE MACHINE

- ❑ **32** Before leaving the operator's seat:
 - lower all implements and attachments to a safe position;
 - check you have locked out all control systems;
 - shut down the engine and remove the keys.

OPERATING METHODS

Harvesters

- ❑ 23 Wherever possible the direction of harvesting will change with the slope to select the lowest gradient for the machines to operate on.
- ❑ 24 As a general rule swathe width will reduce with steepness of slope for harvesters on a fixed base, ie those without tilting base mechanisms.
- ❑ 25 All harvester operators should be aware of weight transfer when slewing larger trees at any distance from the machine. Operating technique should be modified according to the conditions, for example drawing the tree in towards the machine or felling at 45° to the slope.
- ❑ 26 The harvester may be able to work where a forwarder cannot, so material must be placed where it can be safely reached by the forwarder. Other methods of extraction may need to be considered, for example using a cable crane to extract timber.
- ❑ 27 Correct brash mat construction is essential to working safely on slopes:
 - Use residue to fill natural hollows and plough furrows.
 - Place oversize and twisted residue in the timber zone.
 - Avoid laying long, slippery (debarked) lengths of material in the brash mat.
 - Cut stumps as low as possible and avoid wheels or tracks running over stumps where possible.
 - Consider felling to left and right of the harvester to produce an even depth of brash mat.
 - Reduce the stepped effect of obstacles by using brash to create a uniform surface.
 - Note that brash mats can be disturbed by machine travel, exposing other hazards such as rock, shale and rutting from wheel/traction aid digging.
 - Brash mats and machines can slip on soils with a pronounced humus layer, ie peaty gleys.

Forwarders

- ❑ 28 A circular extraction route may be required to access the steep ground when descending with a load.
- ❑ 29 It is essential to plan loads and moderate load size according to slope and ground conditions.
- ❑ 30 Operators should use the loader to draw material to the machine before lifting.
- ❑ 31 Avoid reversing up steep slopes when loaded and vision is obscured. Use other methods to retain the load on the bunk.

OTHER MACHINERY

- ❑ 32 For other operations the same principles of site planning and machine stability apply.

FURTHER READING

<i>Extraction by cable crane</i>	FISA504
<i>Mechanical harvesting</i>	FISA603
<i>Mechanical roadside processing</i>	FISA605
<i>Excavators in tree work</i>	FISA704
<i>Emergency planning</i>	FISA802
<i>Electricity at work: Forestry</i>	FISA804
<i>Training and certification</i>	FISA805
<i>Managing Public Safety on Harvesting FC</i>	forestry@apsgroup.co.uk
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NOTES

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THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG705 Steep slope working in forestry, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Steep slope working in forestry



Image courtesy of UPM Timhill

INTRODUCTION

This leaflet covers the safe work practices to be followed when harvesting and extracting trees on steep or difficult ground. It must be used in conjunction with FISA leaflets 501 *Tractor units in tree work*, 503 *Extraction by forwarder*, 504 *Extraction by cable crane*, 603 *Mechanical harvesting* and leaflet INDG294 *Managing health and safety in forestry*.

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when operating machinery on steep or difficult ground in the forest.

The guidance also applies to other mechanised operations (eg ground preparation) in the same steep or difficult conditions.

All operators must have had appropriate training in how to operate the machine and how to carry out the tasks required (see FISA leaflet 805 *Training and certification*).

RISK ASSESSMENT

- ❑ 1 The risk assessment process will be similar to any conventional harvesting site, but the increase in slope will mean that there will be more effort needed while planning how the work will be carried out including:
 - choosing which machine to use;
 - who should operate the machines; and
 - deciding how to supervise the work and take account of changing conditions.
- ❑ 2 To work safely on steep ground you will need to think about the entire harvesting operation and not just the forwarder or harvester alone. This will mean that everyone involved in the work will need to be in regular contact with each other. Record how you plan to do this in your risk assessment and site safety rules.
- ❑ 3 Every operation will be different and you will need to assess the specific site and the weather conditions when using this leaflet.
- ❑ 4 Everyone operating machinery on steep ground must have received the appropriate training and be competent to carry out this type of work.

PLANNING AND ORGANISATION

- ❑ 5 It is the ultimate responsibility of the Forestry Work Manager (FWM) to decide how the forestry operation will be carried out on site. Managers, contractors and operators must meet before the work starts to discuss the limits of any machinery used during the operation. Specific plans should be made to regularly review how the work is being carried out throughout the operation. Reviews of how the work is being carried out should also be made as necessary whenever circumstances change on site.

- ❑ 6 Operators should not make changes to the planned system of work without agreement from the FWM. It is likely that the FWM will need to visit the site more frequently for steep ground working to supervise and monitor how the work is being carried out.
- ❑ 7 Keep records of pre-commencement meetings along with the risk assessments, which should include details of the agreed frequency of site visits.
- ❑ 8 Keep records of site visits and review the risk assessment regularly as the operation progresses.
- ❑ 9 Site safety rules should identify the person on site responsible for communications and give instructions on how the work should be carried out. They should also include details of any lone working arrangements and emergency procedures.

THE SITE

- ❑ 10 Slope alone is often not the controlling factor on any worksite – the soil condition, moisture content, depth and underlying material must be considered as well as the roughness of the terrain, including boulders and stump size.
- ❑ 11 When planning how the work should be carried out on a specific site, you should consider:
 - the terrain classification, eg slope measurements, soil/ground condition, ground roughness, erodable soils, boulders etc;
 - operational factors, eg size and type of tree, type of tree/brush quality, potential stump height, cutting specification;
 - environmental conditions, eg weather conditions, water on site, possibility of flash floods, siltation, pollution, visibility;
 - identifying alternative work areas;
 - recovery arrangements including dealing with oil spills;
 - the possibilities of modifying the site by constructing tracks or ramps.

MACHINE SELECTION

- ❑ 12 Before starting work, carry out an assessment to identify the suitability of the machine in relation to the site and the task to be undertaken. The equipment to be used must be fit for the purpose of harvesting timber on steep ground.
- ❑ 13 Forestry work on steep slopes will involve a risk of the machinery overturning. Therefore, all machinery used on slopes must have suitable roll-over protection structures (ROPS) fitted. Purpose-built wheeled forestry forwarders and harvesters and purpose-built tracked harvesters have ROPS. ROPS will only protect operators if they wear the seat restraint provided. Seat restraints must be provided where ROPS are fitted.

- ❑ 14 Standard excavator-based tracked machinery is unlikely to have ROPS and is not suitable for working on slopes where there is a significant risk of roll-over. Where a protective structure has been added, ask the supplier about how much protection it provides, ie will it protect the operator if the machine rolls over?
- ❑ 15 Make sure the manufacturers' recommendations are understood and followed regarding maximum slope limitations and methods of operation.
- ❑ 16 The configuration of wheels, bogies, rigid or floating tracks must be considered and must be appropriate for the conditions in which the machinery will be working.
- ❑ 17 Wheel chains and bandtracks will be needed on most steep sites and must be in good condition. Tyres must also be in good condition and inflated to the recommended pressures. Grouser heights must be suitable for slope and ground conditions.
- ❑ 18 It is also important to understand the effects of weight distribution and changes in centre of gravity when considering variations in both the steepness of slope and other ground and environmental conditions.
- ❑ 19 All machines used on steep ground must be in suitable working condition and maintained to the highest possible standard. The track condition must be inspected regularly and maintenance records kept.
- ❑ 20 Harvesters with tilting cabs allow improved operator ergonomics while working on steep ground. The operator must be aware of the overall angle of the machine, which can be difficult when working in a tilting cab. Remember that forwarders following such harvesters are unlikely to be fitted with tilting cabs, and will have a much higher centre of gravity when loaded.

OPERATOR SELECTION

- ❑ 21 It is essential that managers ensure those working on steep ground sites have received the necessary training and have sufficient experience using the chosen equipment on steep slopes. Most training will be provided 'in-house' and operator's experience of working on slopes should be built up gradually.
- ❑ 22 Operators must work within their own capabilities and play a key part in communicating with those managing the operations as the site progresses. Operators should never be instructed to work on slopes that they feel are outside their capabilities or the capabilities of their machines.

INTRODUCTION

The purpose of this leaflet is to help minimise the time taken for the emergency services to reach you and advise on ways to minimise the risk to operators if there is an emergency. It also highlights the need to include environmental and other emergencies within the planning process.

You can use this leaflet as part of the risk assessment process to help identify controls which can be used as part of an emergency planning procedure.

PRECAUTIONS

- ❑ 1 Avoid working alone. If you must, you should make arrangements for someone to check on you at regular intervals. The greater the risk, the more frequent the checks should be. As a minimum requirement, always inform your contact when work starts and finishes.
- ❑ 2 If you are part of a team scattered across an area, everyone in the team should arrange to meet at agreed times throughout the day.
- ❑ 3 Carry a personal first-aid kit on you while at work. It should contain at least a large wound dressing, a pair of plastic gloves and a Resusciate (or similar device). This is in addition to a worksite first-aid kit which should be kept at a central location (see HSE leaflet INDG214 *First aid at work: Your questions answered*).
- ❑ 4 Employers and the self-employed need to assess the first-aid requirements of their work. Make sure there are enough suitably trained first-aid personnel (first-aiders) and facilities so that immediate assistance is available to casualties of illness or injury, and that an ambulance or other professional help can be summoned without delay. The assessment should also identify which items need to be in the worksite first-aid kit.
- ❑ 5 The first-aid assessment should take account of:
 - the nature of the work;
 - the past history and consequences of accidents;
 - the nature and distribution of the workforce;
 - the remoteness of the site from the emergency services, including location, terrain and weather conditions;
 - working on shared or multi-occupied sites;
 - holidays and other absences of first-aiders;
 - the presence of trainees and the public;
 - the possibility of medical conditions or allergies. (The use of MedicAlert® may be considered, visit www.medicalert.org.uk for details.)

FORWARD PLANNING

- ❑ 6 For any emergency procedures to work well, it is vital that all operators and managers are aware of the procedures and have had the opportunity to test them.
- ❑ 7 Anticipate problems that will exist in getting to a casualty, eg releasing a casualty that has been trapped below a tree or heavy equipment. Identify the personnel and equipment that need to be on site and establish how to quickly get access to others that may become necessary.
- ❑ 8 Identify hazardous overhead or underground services at the worksite, eg overhead/underground power lines, gas mains etc. Arrange any emergency contact details and site evacuation procedures that may be necessary.
- ❑ 9 Be aware that a spillage of petrol, diesel, urea or pesticide can cause harm to the environment (particularly aquatic plants and animals) and contaminate drinking water supplies. Emergency procedures should be put in place and followed if there is a spill. They should include contact details, what needs to go in a spill kit, how to use it and where it should be deployed.
- ❑ 10 Emergency procedures should be tested, evaluated and modified, as necessary, to ensure they are working.

EMERGENCY PROCEDURES

- ❑ 11 If there is an emergency, make sure the site is safe for you, the casualty and any other people in the area. Look out for hung-up trees, dangerous parts of machinery, high-voltage electricity cables etc.
- ❑ 12 Put in place a system for contacting the emergency services, power/gas/water companies and environmental agencies (EA/SEPA) as necessary. Ensure the system is clearly understood by all people working on the site. Identify areas of poor radio and mobile telephone reception. The emergency services may be contacted using a mobile phone (112 or 999) or public telephone (999).
- ❑ 13 Ensure you know your location. Be able to provide the emergency services with the necessary information to find the site, eg the grid reference and the access points from the main road to your location in the forest or woodland. In urban areas street names will be required. If possible send someone to meet the emergency services at a designated meeting point to guide them to the site.
- ❑ 14 Evacuation measures need to be examined as part of the risk assessment by the owner, site manager or main contractor and outlined in the site safety rules. You should make sure you are familiar with the evacuation procedure.

- ❑ 15 If after first aid has been administered the casualty can walk and is near to transport or the roadside, help them leave the area. Otherwise only move them if it is absolutely necessary. If the casualty must be carried, wait for trained help to arrive.
- ❑ 16 **The completed emergency procedures should be recorded and should accompany the site-specific risk assessment.** A simple example is given below.

EMERGENCY PROCEDURES – CONTACT DETAILS

Location name	
Grid reference	
Designated meeting place (useful in remote areas to guide the emergency services to the worksite)	
Site location name	
Nearest access point	
Street name/district	
Type of access (public road/light vehicles, four-wheel drive)	
Suitable helicopter landing area	
Phone number of nearest doctor	
Location of nearest Accident and Emergency hospital	
Phone number	
Works Manager contact details	
Radio call sign	
Phone number	
Mobile number	
Your own contact number	
Mobile number	

FURTHER READING

<i>ATV quad bikes</i>	FISA701
<i>All-terrain vehicles</i>	FISA702
<i>Emergency planning</i>	FISA802
<i>Training and certification</i>	FISA805
<i>First aid at work: Your questions answered</i>	INDG214
<i>Managing health and safety in forestry</i>	INDG294
<i>Don't lose your hearing.</i>	INDG363

These publications are available from the FISA and HSE websites.

Scottish Executive publication (www.scotland.gov.uk):
The Muirburn Code

Forestry Commission Technical Notes (www.forestry.gov.uk):	
<i>Planning controlled burning operations in forestry</i>	FCTN002
<i>Forest and moorland fire suppression</i>	FCTN003
<i>Burning forest residues</i>	FCTN004

Name:.....

Checklist verified by:.....

Date:

Further information

This guide is produced by the Forest Industry Safety Accord (FISA)
59 George Street, Edinburgh, EH2 2JG Tel: 0131 240 1410
Fax: 0131 240 1411 Email: info@ukfisa.com

Copies of this guide and all other FISA priced and free publications are available by mail order from the FISA office or through the FISA website www.ukfisa.com. From here you will also be able to access a wide range of additional forestry safety information including frequently updated safety alerts.

This guide sets out evidence of good practice for a specific forestry task. Deviation from the guide should only be considered after a full risk assessment has been undertaken by competent persons. Health and safety obligations **MUST** be met at all times.

THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG803 Firefighting, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Firefighting



Image courtesy of Forestry Commission Picture Library

FISA Safety Guide 803

INTRODUCTION

This leaflet covers the safe working practices to be followed when involved in forest or woodland firefighting operations as an individual or part of a team.

Fire planning is not covered in this leaflet. Such planning would form part of an overall risk assessment and include identifying wildfire hazards; developing suitable arrangements and systems of work; and producing a co-ordinated approach with neighbours and Fire and Rescue Services.

This leaflet can be used as part of the risk assessment process to help identify the controls to put in place to prevent accidents during the suppression of wildfires and certain prescribed burning operations. A site-specific risk assessment will be needed as well as any generic risk assessment.

Where quad bikes or all-terrain vehicles (ATVs) are used, this leaflet should be read in conjunction with FISA leaflets 701 *ATV quad bikes* and 702 *All-terrain vehicles*.

All operators must have had appropriate training and be competent to carry out the tasks required (see FISA leaflet 805 *Training and certification*). Operators must also be aware of the hazards likely to be found at a forest or woodland fire including helicopters, vehicles and other equipment used for fire suppression.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- ❑ 1 Those on site during firefighting operations may require specific PPE which should have been identified in the risk assessment. However, use the following for general firefighting operations:
 - A brightly coloured fire-resistant cotton boiler suit (complying with EN 531) is recommended, as well as a protective neck cloth. Do not wear any synthetic or nylon clothing.
 - Protective boots with good grip and ankle support (complying with EN ISO 20345).
 - Suitable protective gloves (non-synthetic, eg leather).
 - Safety helmet (complying with EN 397), if identified as required by the risk assessment.
 - Eye protection (complying with EN 166), if identified as required by the risk assessment, to prevent eye damage from particles and embers.
 - Hearing protection (complying with EN 352) where the noise level exceeds 85 dB(A) (see HSE pocket card INDG363 Don't lose your hearing).
- ❑ 2 Carry water for personal consumption and to wash any burns.
- ❑ 3 A specialised burn first-aid kit should be available on the site, and each person should carry a personal first-aid kit for non-burn injuries.

GENERAL

- ❑ 4 The Fire and Rescue Service, when present, will be responsible for directing operations at a wildfire.
- ❑ 5 Expect to be in the open conducting physically demanding operations for long periods. Workers should be fit and capable of carrying out the tasks expected of them.
- ❑ 6 Watch colleagues for signs of heat stress due to physically demanding work and close proximity to the fire. Also watch for burns from radiant heat.
- ❑ 7 Be particularly aware of the hazards involved in crossing terrain during conditions of reduced visibility, due to poor light or smoke.
- ❑ 8 Watch for factors (or combinations of factors) that could create sudden changes in fire behaviour, including:
 - weather (eg change of wind direction and speed);
 - fire moving onto steep slopes;
 - the nature and quantity of fuel available to the fire (eg thick heather).
- ❑ 9 Maintain communications with your colleagues and supervisors.

TOOLS, EQUIPMENT AND MACHINERY

- ❑ 10 There may be a wide variety of tools, equipment and machinery (including vehicles and helicopters) in use on the fireground. Operators are likely to be working under pressure, sometimes in poor visibility or with considerable background noise, so take particular care if approaching them.
- ❑ 11 Ensure that you, and anyone you are responsible for, are aware of the safety zones that apply to the tools, equipment and machinery on site.

FIRE PLANS AND FIRE MAPS

- ❑ 12 Ensure you have read and understood your organisation's fire plan and are familiar with the procedures to follow in an emergency.
- ❑ 13 Ensure you have looked at and understand any fire map, including any symbols used.

PREPARING FOR WILDFIRE FIGHTING

- ❑ **14** Thoroughly check all PPE, tools, equipment and machinery to ensure they are serviceable. Put appropriate PPE on before approaching the fire.
- ❑ **15** Select tools for the expected fuel types and fire behaviour (eg conveyor belt beaters for grass and mesh for heather). Also take tools for each phase of fire suppression to the fireground, ie knock down, containment, mop up and patrol.
- ❑ **16** If using synthetic foam concentrate, wear appropriate PPE, fill tanks away from watercourses and drains and replace lids on drums. If foam concentrate touches the skin or eyes, immediately wash with water and treat according to the instructions on the product label. If serious seek medical attention.
- ❑ **17** Secure tools and equipment properly for transport. Check that total loads, including water, do not exceed your vehicle load capacity, and are suitable for the expected terrain.
- ❑ **18** Mark safe routes to and from the fireground for the Fire and Rescue Services and other personnel. Identify suitable locations for parking vehicles safely (marshalling areas). As far as possible, keep pedestrian and vehicle access routes separate.
- ❑ **19** Obtain information on the fire and assess fire behaviour yourself before approaching it. When appropriate provide information to your supervisors or fire service personnel.
- ❑ **20** Where appropriate, discuss your local knowledge of access routes, water points, potential firebreaks etc with the incident commander.
- ❑ **21** Make sure you have been given a briefing on your own role in the firefighting activities.

FIREFIGHTING

- ❑ **22** **Ensure you are booked in and booked out by the organisation managing the fire, when entering or leaving the fireground.**
- ❑ **23** Fight the fire, but always put safety first (see the 'WATCHOUT' safety aid in Table 1).
- ❑ **24** Operate within your agreed level of authority and responsibility.
- ❑ **25** Operate within your physical capability, maintain a steady pace of work, take breaks and drink plenty of water.
- ❑ **26** Maintain a balanced stance when using hand tools and avoid difficult terrain or other obstacles, especially when carrying weight, eg knapsack sprayers.
- ❑ **27** Identify two suitable escape routes leading away from the fire.
- ❑ **28** Maintain a safe working distance from colleagues when using hand tools, including firebeaters, mattocks and axes.

Table 1: The Wildfire 'WATCHOUT' safety aid

W	weather	dominates fire behaviour, so keep informed
A	ctions	must be based on current and expected fire behaviour
T	ry out	at least two safe escape routes
C	ommunications	must be maintained with your crew leader and adjoining crews
H	azards	to watch for are steep slopes and the amount of fine fuels
O	bserve	changes in wind speed and direction, humidity and cloud
U	nderstand	your instructions and make sure you are understood
T	hink	clearly, be alert and act decisively before your situation becomes critical

- ❑ **29** Ensure the safety zones for equipment, including high-pressure fire fogging systems, chainsaws, tractor and chain swipe, are clear before operating.
- ❑ **30** Always stay at least 40m away from helicopters, especially during taking off or landing. Only approach a helicopter if a clear instruction is given by the pilot. When helicopters are water bombing, all ground staff should be at least 10m outside the target area.
- ❑ **31** Avoid working in thick smoke wherever possible, as it can cause irritation of the eyes, nose, throat and lungs and increase the risk of getting lost and confused.
- ❑ **32** Avoid working under power lines.
- ❑ **33** Ensure the fire is out before moving on to the next task or ensure your supervisor is made aware that the fire is not out in your area if given instructions to move.

FURTHER READING

<i>Using petrol-driven chainsaws</i>	FISA301
<i>Use of winches in directional felling and takedown</i>	FISA310
<i>Tree-climbing operations</i>	FISA401
<i>Mobile elevating work platforms (MEWPs) for tree work</i>	FISA403
<i>Emergency planning</i>	FISA802
<i>Training and certification</i>	FISA805
<i>Management of health and safety in forestry</i>	INDG294
<i>Avoidance of danger from overhead electric power lines GS6</i>	978 0 7176 1348 8
<i>Avoiding danger from underground services HSG47</i>	978 0 7176 1744 9
<i>Electricity at work: Safe working practices HSG85</i>	978 0 7176 2164 4
<i>Memorandum of guidance to the Electricity at Work Regulations 1989 HS(R)255</i>	978 0 7176 6228 9

These publications are available from the FISA and HSE websites.

Advice on what to do in an emergency is in the Energy Networks Association (ENA) leaflet Electricity Emergencies. This includes emergency telephone numbers for UK electricity network operators and safety information for farmers and agricultural contractors. Available from the ENA website www.energynetworks.org.

Name:

Checklist verified by:

Date:

Further information

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THINK SAFE / STAY SAFE

This publication is based on guidance previously published by HSE in AFAG804 Electricity at work: Forestry, which was withdrawn in 2013.

For more general information about health and safety, please visit the Health and Safety Executive website www.hse.gov.uk



Electricity at work: Forestry



Image courtesy of Forestry Commission Picture Library

FISA Safety Guide 804

INTRODUCTION

- ❑ 1 This leaflet covers the safe working practices to be followed by those working on forest operations near overhead power lines (OHPLs) and underground electricity cables, who are not working for the Network Operator. Contractors and employees working for the Network Operator that owns the electrical equipment have specialist competencies that enable them to work within the Energy Networks Association (ENA) guidance.
- ❑ 2 To ensure that the right tasks are carried out by the right people, this guidance groups these health and safety tasks into management roles as defined in the HSE/FISA publication *Managing Health and Safety in Forestry*:
 - Landowner;
 - Forestry Work Manager (FWM); and
 - Contractor;
- ❑ 3 Where it is necessary to work close to OHPLs, detailed guidance on avoiding danger from OHPLs is published by HSE in Guidance Note GS6 *Avoidance of danger from overhead electric power lines*. Guidance on safe working practices on or near electrical systems is published in HS(R)25 *Memorandum of guidance to the Electricity at Work Regulations 1989*, HSG85 *Electricity at work – safe working practices* and in HSG47 *Avoiding danger from underground services*.

HAZARDS INVOLVED

- ❑ 4 Contact with OHPL causes fatal or severe electric shock and burn injuries. This can either be by direct or indirect contact, for example through a fallen tree, vehicle, rope or fence wire. This can also happen when a person or object is close enough to a line for a flashover to occur. Striking underground cables may lead to burn injuries from the resulting ‘explosion’ and may also result in fatal electric shock if contact is made with energised (live) conductors.
- ❑ 5 Everyone must assume that all overhead and underground electrical equipment is energised unless it has been confirmed by the Network Operator that it has been de-energised (isolated and earthed). This will be arranged by the Network Operator issuing a Permit to Work, or similar document, to an authorised permit holder.

COMPETENCE

- ❑ 6 All those involved in controlling, supervising and carrying out work near live electrical equipment should be competent and should have received adequate instruction as well as training in the correct procedures and precautions they must take. The level of supervision should also reflect the risks involved.
- ❑ 7 All operators must have had appropriate training, and any relevant refresher training, in how to operate any equipment or machinery and how to carry out the tasks required (see FISA 805 *Training and certification*).

- ❑ 8 All workers must be made aware, through safety briefings based around this document, of the onsite dangers and the appropriate precautions and actions to take.
- ❑ 9 The Network Operator may provide electrical awareness training to FWM or contractors on request.

PLANNING

- ❑ 10 Landowners should consult the Network Operator well in advance to discuss each of their forthcoming programmes. With this advanced planning, Landowners may find that the Network Operators have planned shutdowns that coincide with their work near electrical equipment. Likewise Network Operators might rearrange their maintenance activities to fit in with felling plans.

WORKSITE PLANNING

- ❑ 11 Start the necessary discussions with the Network Operator well before work starts, usually at least two months, where operations are to be carried out within 2 tree lengths plus the vicinity zone of the OHPL or close to underground cables.
- ❑ 12 In consultation with the Landowner and Network Operator, the FWM must find out the routes of **all** OHPL and underground cables that cross or are near the worksite and access routes and confirm this by onsite inspection. These must be clearly marked on the site and the site maps.
- ❑ 13 Organise operations within the worksite to minimise the need for mobile equipment to pass below or close to OHPLs or over underground cables.
- ❑ 14 Agreement should be reached with the owner of the OHPL, usually the Network Operator, for the OHPL to be de-energised and made safe. Where it is not practicable to de-energise the OHPL, follow the precautions in this leaflet.
- ❑ 15 You must **never** measure OHPL height using tape measures or other solid measuring devices and must be done through the Network Operator.
- ❑ 16 Prepare site-specific risk assessments, and method statements, and ensure these incorporate any advice received from the Network Operator.
- ❑ 17 You must assess the effect of the site characteristics, such as slope and the weather conditions, that could affect how the work may be done.
- ❑ 18 Operators or drivers must check the heights of vehicles to ensure that they do not exceed the maximum safe height and can pass beneath the lines with a suitable clearance as defined by Network Operator. This can be best achieved through discussion with operators using fixed reference points that will not exceed the safe clearance heights within the worksite and access roads.

- ❑ 19 Ensure there is a warning notice prominently displayed inside the cab of all machines that may have to work near OHPLs. The notice should give the maximum working height of the machine and the maximum height in the transport position.
- ❑ 20 Plan and designate safe loading areas (minimum 10m from the OHPL) for timber stacks and clearly mark these on the site harvesting plan.
- ❑ 21 At the pre-commencement meeting identify:
 - the location of the OHPL and underground cables on maps and on site;
 - the name of the Network Operator contact for when more information is required; and
 - the Network Operator's emergency number.
- ❑ 22 Do not reduce the clearance between the ground and OHPLs in any way, for example by creating brush mats or resurfacing roadways, without having the line height re-measured.

ACCESS ROUTES TO THE WORKSITE

- ❑ 23 The Landowner must establish the safe access routes with the FWM who will brief operators, including contractors and hauliers on those routes.
- ❑ 24 Where OHPLs cross the access road to a worksite, the Landowner must consult the Network Operator to establish the height of the OHPLs. Warning notices must be prominently displayed at each side of the lines, clearly showing the maximum safe height for vehicles passing under the lines and clearly marked on all site maps.
- ❑ 25 When travelling to and from a worksite, the operator or driver must ensure machine attachments and loads are kept below the maximum safe height.

ACCESS ROUTES WITHIN THE WORKSITE

- ❑ 26 Where OHPLs cross the worksite and it is necessary to cross under OHPLs, the FWM must consult the Network Operator to establish the height of the OHPLs.
- ❑ 27 Within the worksite, the FWM will clearly identify the safe clearance for driving alongside OHPLs and underground cables by providing suitable barriers. In many cases, marked trees or high stumps will form the basis of a suitable barrier, as long as there is no opening which would allow access for vehicles. The absolute safe minimum driving distance from the barriers to the OHPL is 10 m. The Network Operator may advise distances greater than 10 m depending on the voltage of the line and the nature of the terrain. See Figure 1.
- ❑ 28 Erect goalposts at all points within a worksite where it is necessary to cross under OHPLs. Ensure that there are barriers to prevent any crossing other than at the designated crossing points. Consult the Network Operator on the required height of the posts' cross members to establish appropriate clearances from the conductors.

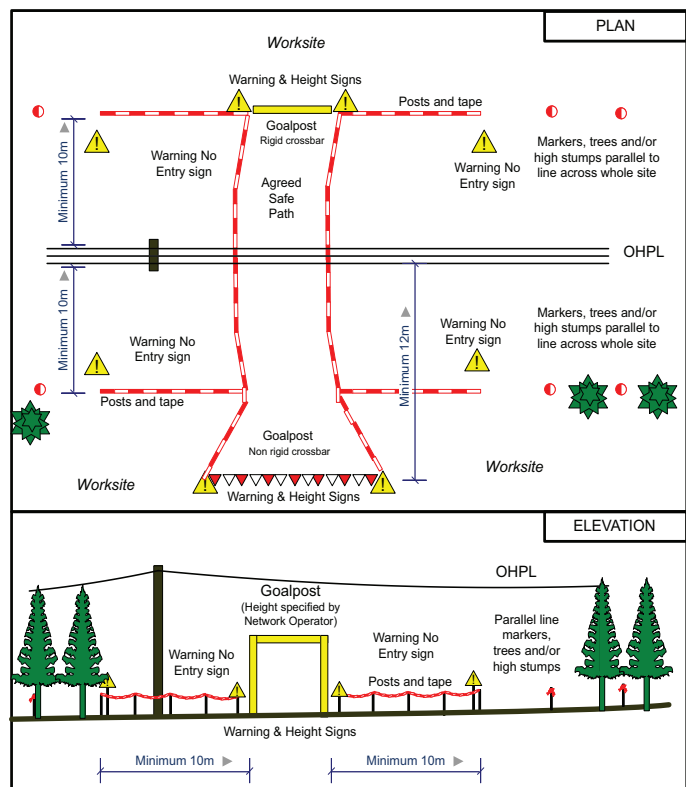


Figure 1: Site layout

- ❑ 29 Goalposts also need to be erected where lines cross any route that is used to move between nearby worksites.
- ❑ 30 Goalposts should be constructed from rigid, non-conducting material, such as timber or plastic pipe and be highly visible by their colour or distinctive marking, for example red and white stripes.
- ❑ 31 If the agreed safe path is too wide to be spanned by goalposts with a rigid non-conducting crossbar, you may have to use tensioned plastic ropes with bunting attached.
- ❑ 32 Where it is necessary to travel over or near underground cables consult with the owner to determine their depth and protection measures required. See *Underground Cables Section*.
- ❑ 33 When working close to OHPLs, move ladders, scaffold poles, other poles or any long objects horizontally and keep them as low as possible.

UNDERGROUND CABLES

- 34 Underground cables may not be very far below the surface. Before you start any operation that might damage underground cables, for example digging, ditch maintenance, crossing with heavy machinery or timber stacking, ensure, so far as is reasonably practicable, whether there are any underground power cables where you are working. Check with the Network Operator and with the site manager on maps, and look for location markers on the ground. If a cable runs down an overhead line support, this shows that there are underground cables.
- 35 Where you identify underground cables, the owner of the cables and FWM should walk the site to identify, with the use of cable locating devices, the edges and approximate depth of all cable-runs on the worksite and mark these on the site and the constraints map.
- 36 Where access is required, and you have to travel over underground cables, the FWM must consult the owner of the cable to discuss working methods and protection.
- 37 Markers must be erected at **all** access points to indicate that it is an authorised access point to the worksite. All agreed crossing points within the worksite must also be marked.
- 38 Where digging work must be carried out near underground cables, consult the owner of the cables. Carry out the safe digging procedures detailed in HSE's Guidance book HSG47 *Avoiding danger from underground services*.

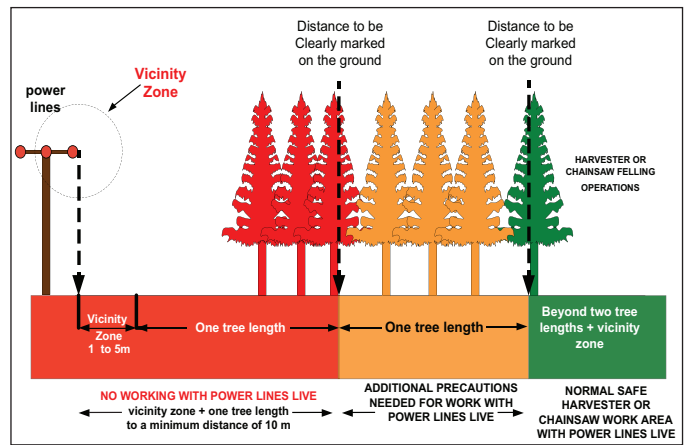


Figure 2: Red/Amber Zones (Uniform height crop)

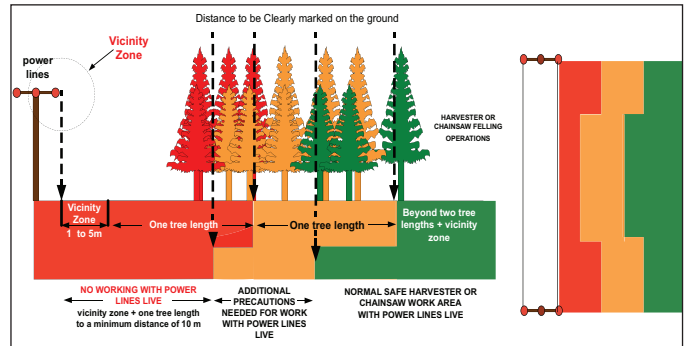


Figure 3: Red/Amber Zones (Uneven height crop)

TREE-FELLING OPERATIONS – OHPL

- 39 For tree felling operations, trees should be assessed for their falling distance in relation to the overhead line. They should be categorised as being in either: a Red, Amber or Green Zone.
- 40 These zones are illustrated in *Figures 2, 3 and 4* and defined as:

Red Zone: The area next to the OHPL containing all trees within falling distance of the Vicinity Zone of any conductor and all trees which could cause damage to any support structure.

In normal circumstances the extent of the Red Zone is measured on the ground from directly underneath the outermost conductor to the centre of the tree (minimum 10 m). This should be done by the FWM in consultation with the Network Operator.

The extent of the Red Zone could vary greatly along the length of the line when taking full account of variations in line height, cross-arm widths, steep slopes, valleys and variations in tree heights. Only when this is specifically addressed in the risk assessment, and agreed by the FWM and the Network Operator can a more specific assessment of tree falling distance to the Vicinity Zone of any Conductor or supporting structure be made. Where this more precise definition is used, it is essential that the measurements are taken by suitably trained Network Operator personnel using accurate methods.

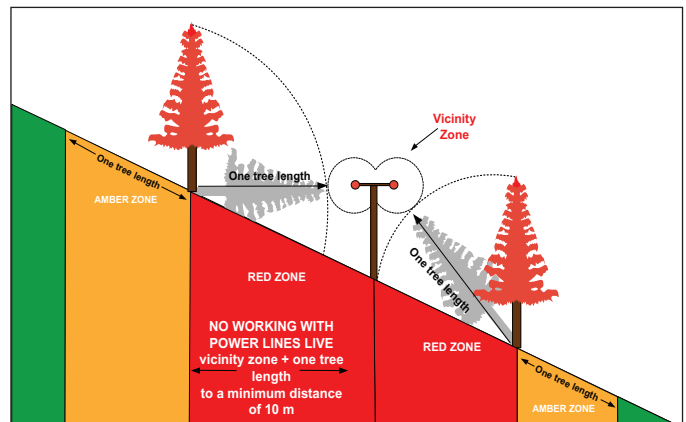


Figure 4: Red/Amber Zones on a side slope

Amber Zone: The area from the Red Zone up to a distance of one further tree length. This zone acts as a buffer to protect the Red Zone and within it trees may be felled either away from or parallel to the OHPL, following conditions set out in Section 43.

Green Zone: The area beyond the Amber Zone that is two tree-lengths plus the Vicinity Zone (normal forest operations).

- 41 The vicinity zones (Table 1) around an OHPL are the areas in which there is the danger of electricity flashover if someone enters, this distance increases as the voltage increases.

Table 1 Vicinity zone distances

Nominal system voltage (kV)	Minimum distance for vicinity zone (metres)
Up to and including 1 kV	1 m
Exceeding 1 kV but not exceeding 11 kV	2 m
Exceeding 11 kV but not exceeding 33 kV	2.5 m
Exceeding 33 kV but not exceeding 66 kV	3 m
Exceeding 66 kV but not exceeding 132 kV	3.5 m
Exceeding 132 kV but not exceeding 275 kV	4 m
Exceeding 275 kV but not exceeding 400 kV	5 m

- 42 Where there are any trees to be felled in the Red or Amber Zone then there must be consultation between the FWM and the Network Operator. Where you can arrange to turn the power off then the work should be done with the line de-energised (isolated and earthed) and a Permit to Work issued to an Appointed Person.
- 43 Where a OHPL **cannot** be de-energised, then **Red Zone trees will not be felled** and felling within the **Amber Zone** will only be allowed provided the following conditions are met.
 - The Red and Amber Zones must be clearly marked on site by the FWM and Network Operator. Use paint or high-visibility tape on the trees or any other suitable marking method.
 - A consultation between the FWM and the Network Operator must take place. There must be a written agreement for the marking of Red and Amber Zones and the felling and extraction arrangements. This will make clear that no Red Zone trees will be felled with the line energised.
 - Operators must be made aware of the dangers from electricity, how to avoid the danger and what to do in an emergency. If this is not done through formal electrical awareness training, then it must be justified in the risk assessment.
 - Ensure you use only trained and competent operators with the relevant chainsaw or Forestry Machine Operator Certificate of Competence.
 - Felling should be arranged so that trees are felled away from, or parallel to the conductors, taking account of terrain, aspect, species and tree height.

- Traffic movement on site should be properly controlled. Ensure that no part of any machine, load, or tree being processed can come within 10 m of any overhead conductor when working alongside an OHPL.
- Assess and take account of the ground conditions.
- Assess the weather conditions and make sure the wind direction does not affect control of the felling direction. If it is likely to have an adverse effect, stop operations until the wind speed drops to an acceptable level.

- 44 **If tree-felling work is required within the Red Zone with the line energised, then this will only be carried out by staff engaged directly by the Network Operator, with the Network Operator acting as FWM. These works will only take place in accordance with Engineering Recommendations that have been published by the Energy Networks Association.**
- 45 Where the OHPL **can** be de-energised the following is required.
 - A system to ensure the line has been de-energised and made safe before work begins – this will involve the Network Operator issuing a safety document stating that the line has been isolated, earthed and will remain so until the safety document is signed-off on completion of the work.
 - The safety document should only be issued to a competent person capable of understanding the electrical hazards and controls, and overseeing the forestry operations.
 - All those on site must be made aware that they must treat the line as energised until the safety documentation is in place and the line de-energised.
 - The line must be dropped from between relevant supports or under the direct control of a trained and competent person authorised by the Network Operator. The competent person must be briefed on the forestry aspects of the site and remain on site until the work is complete.
 - Timber must be placed at least 10 m from the OHPL to enable safe extraction when the line is re-energised (see figure 5.);
 - As soon as either the earths are removed or the safety document is signed-off the line must be treated as energised.
 - All work parties must be told when the line is being re-energised.
 - The line to be handed back to the Network Operator and the safety documentation signed-off before the line is re-energised.

TIMBER EXTRACTION OPERATIONS

- 46 Do not operate a forwarder or skidder if any part of the machine or its load (product being lifted) is likely to come within 10 m of energised OHPLs. Where necessary, clearly mark the limit of work in relation to the energised OHPLs (see Figure 5). Use high-visibility tape or other markings.
- 47 The forwarder or skidder must be operated from the opposite side of the timber from the OHPL.

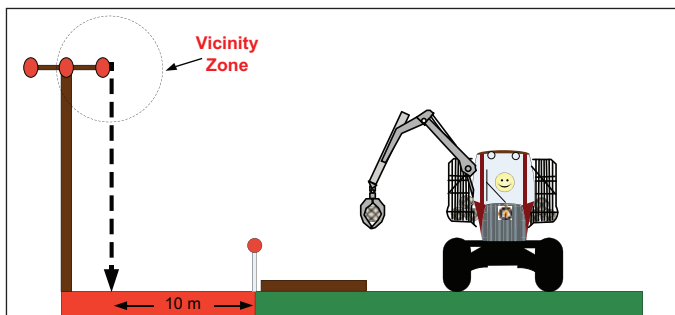


Figure 5: Timber layout and extraction

- ❑ 48 Where loaded skidders are being driven under OHPLs, there must be goalposts and the tree butt should be secured directly against the butt plate. Where this is not practical due to stability, then an agreed safe working method must be discussed with the Network Operator.
- ❑ 49 When thatching tracks for timber extraction, ensure that no brash is lifted or placed within 10 m of an energised OHLP.
- ❑ 50 Do not stack timber in any place where it would be possible for the machine or timber being handled to contact or come close to the energised line.

CABLE CRANE SYSTEM

- ❑ 51 If you are using a high lead or skyline cable crane system.
 - Do not transport or reposition a cable crane winch with the mast raised if it is within 10 m of an OHPL.
 - Consult the Network Operator to ensure that Red Zone distances, vicinity zone + one tree length (minimum distance of 10 m), is sufficient for the type of cable crane system and the OHPL.
 - Never cross the route of OHPLs with any type of cable extraction system.
 - Normally no part of the aerial setup (i.e. tower/mast, skyline, haul lines, guy, spar or supports) should be located within the Red Zone of an OHPL (see Figure 6). In exceptional circumstances it may, on occasion, be

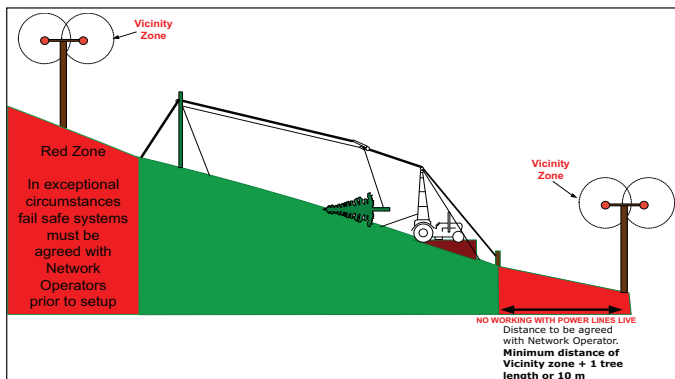


Figure 6: Cable crane set up

necessary to have guys or anchors **but NOT running ropes** located within this zone. This must incorporate fail-to-safe restraint systems and be agreed with the Network Operator – and the guys and anchors made of non-conductive material – no wire ropes or chains.

FENCING

- ❑ 52 Fencing presents some risks, particularly from the fence wire coming in to contact with:
 - the conductors,
 - striking underground cables by digging and driving fence posts;
 - from induced voltages that may be present in fences running parallel to OHPLs – induced voltages will increase with the line voltage and the length of parallel fence and will reduce the further away the fence is from the line.
- ❑ 53 The following precautions should be taken:

Planning

- Plan the route of a new fence to avoid hazards.
- Check the site map for the routes of OHPLs and underground cables.
- Ensure that any underground cables have been identified on the ground and that you have appropriate control measures to avoid contact when driving posts.
- If a wire fence has to be erected close to an OHPL, then plan a route at right angles to the OHPL to avoid induced voltages. Where possible fences should not cross directly under the line to avoid the possibility of fence wire contacting conductors during erection and dismantling. This is a particular problem if fence wire has to be stretched across a valley beneath a line.
- Where winches are used to lay out fence wire near an OHPL, there must be systems to prevent a broken wire contacting the OHPL.
- Do not attach fencing to an OHPL pole.

Consultation

- Consult the Network Operator when running fences within 50 m parallel to OHPLs.

Controls

- To reduce the risk of induced voltages, you may need to earth the wires on these fences, use at least one steel post every 50 to 60 m to earth the fence.
- Never erect or dismantle a fence on your own when near an OHPL, and be aware of the potential dangers of fencing in valleys or when there is lightning.
- Always keep the fencing wire under control – this is particularly important in steep valleys, where clearance may be reduced.
- When assessing hazards (see worksite planning section), be aware of the working height of machines and tools.

OTHER GROUND-BASED OPERATIONS

- ❑ 54 Consider the risks and the identified control measures, and seek advice from the Network Operator for ground-based operations that could come within 10 m of an OHPL, such as ground prep, track construction, road maintenance, use of sprayers, flails or mulcher, tipping trailers or mobile elevated work platforms.
- ❑ 55 Smoke and hot gases from a fire can create a conductive path for electricity. If the method of work involves having a fire on site when clearing rhododendron, scrub or brash, then consult the Network Operator to establish where the fire may be located, limits on the size of the fire, and if there are any other considerations for example terrain or weather.

AERIAL WORKS

- ❑ 56 Make sure you know where OHPLs are near the worksite.
- ❑ 57 When the FWM engages specialist aerial contractors, for example for spraying or fertilising, they must provide maps that clearly identify the position of OHPL to the contractor.

EMERGENCY PROCEDURES

- ❑ 58 Agree the site-specific risk assessment, method statement and suitable emergency procedure with the Network Operator in case of accidental contact or damage to the electrical equipment. This should include:
 - the name or number of the OHPL or underground cable (provided by the Network Operator); and
 - never to touch OHPL or underground cable – assume the line or wires are energised, even if they are not sparking – remember that, even if they are ‘de-energised’, the wires can become ‘re-energised’ again with no notice – this may happen automatically after a few seconds, or they may be re-energised remotely up to several hours later if the Network Operator is not aware that the line has been damaged.
 - Do not go near or touch any person, machine, other plant or tree that is touching or very near an OHPL or underground cable, until you are advised by the Network Operator that it is safe to do so. Warn others to keep away.
- ❑ 59 All accidents and near-misses should be reported immediately to the FWM and the Network Operator emergency number as soon as possible, for example:
 - a collision with a goalpost; and
 - contact with conductors, stays, poles or insulators.

- ❑ 60 The operator of a machine, or the load it is carrying is in contact, with an OHPL or underground cable should:
 - a) If the machine is operable:
 - release the load, lower any raised parts that are controlled from the driving position, and, or, drive the machine clear of the line, as long as neither of these actions risks breaking the line or dragging it to ground level; and
 - contact the Network Operator immediately by mobile phone, or as soon as possible by any other method.
 - b) If the machine is not operable (or cannot be driven free) and it or its load is in contact with or within 5 m of a damaged OHPL:
 - stay in the cab;
 - contact the Network Operator immediately by mobile phone, or as soon as possible by any other method;
 - instruct everyone outside the vehicle not to approach it – touching it or even getting too close could kill them; and
 - do not leave the cab until you have confirmation that the OHPL or underground cable is de-energised.
 - c) If the machine is not operable or cannot be driven free of the line and there is a risk of fire that you can't safely extinguish or other immediate life-threatening hazard:
 - **avoid simultaneous contact with any part of the machine and the ground;**
 - jump as far away as you can from the machine landing on your feet;
 - move away as quickly as possible;
 - warn other people not to approach the vehicle – touching it or even getting too close could kill them;
 - contact the Network Operator immediately by mobile phone, or as soon as possible by any other method; and
 - **do not** return to the machine until you have confirmation that the OHPL or underground cable is de-energised.
- ❑ 61 After any vehicle has been removed from danger and made safe, it must be checked by a competent person to ensure it is working properly before returning to normal use.

Look up, Stay aLive

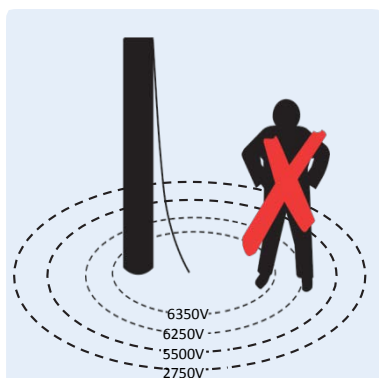


Always take care when operating around overhead powerlines

What to do if contact is made with powerlines

What happens when overhead powerlines are contacted.

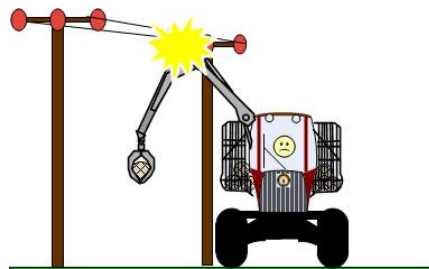
- When your machine touches the line, it immediately becomes energized to the voltage in the wires and the electricity will attempt to pass through the vehicle to the ground.
- Anything else in contact with the powerlines will also become 'live', such as fences and trees.
- Always treat the powerline as live.
- A potentially dangerous electrical field called Step Potential will be created around anything in contact with the powerline. This field extends for approximately 15 metres around these items.
- The illustration shows one foot on the ground at a point having x volts and the other foot a step away at a point having y volts. The voltage difference (x-y volts) determines the current level through the body



This person would receive
 $6350V - 5500V = 850 \text{ Volts}$
THIS CAN BE FATAL

What should you do if the machine is operable

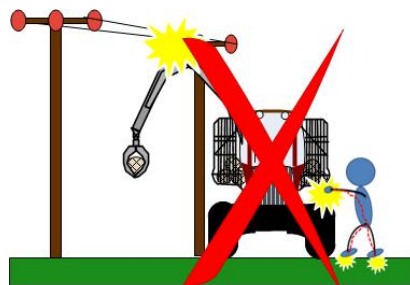
- **STOP WORK**, remain calm and stay in the cab.



- Instruct everyone outside the machine not to approach or make contact with it.
- Disengage from line by lowering plant and slowly drive the machine well clear of the line provided this does not risk breaking the conductor or dragging it to the ground.
- Contact Network Operators Emergency number and tell them what has happened.

What should you do if the machine is not operable and there is no immediate risk to life from fire or other hazard.

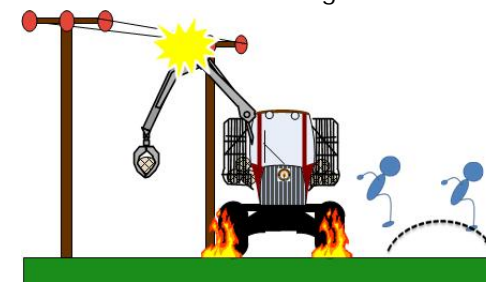
- **STOP WORK**, remain calm and stay in the cab.
- Instruct everyone outside the machine not to approach or make contact with it.



- Contact Network Operators Emergency number and tell them what has happened and that the machine is not operable and that you are still in the cab.
- Do not exit the cab until Network Operator confirms that it is safe to do so.

What should you do if the machine is not operable and an immediate risk to life from fire or other hazard.

- **STOP WORK**, remain calm.
- Instruct everyone outside the machine not to approach or make contact with it.
- Do not step down from the machine. **Jump clear** of the machine and **do not** make any contact with any part of the machine when on the ground.



- Land with the feet kept as close together as possible and avoid placing hands on the ground.
- Shuffle away from the machine – by taking half steps only or hop with both feet together.
- Avoid taking full steps or spreading the feet in any direction.
- When well clear of the machine, continue to treat the machine as live.
- Contact Network Operators Emergency number and tell them what has happened.

In all emergencies.

- Contact all relevant emergency services.
- Tyres can explode during or after contact with powerlines – isolate and maintain a safe distance for 24 hrs.
- Deal with the emergency situation calmly ensuring own safety and the safety of your colleagues and the public are not compromised by your actions.
- Do not leave the site unattended – remain on site until Network Operator arrives.
- Inform your manager about the incident.
- Machinery must be checked for damage before normal use continues by a competent person.

Network Operators emergency contact number:

Risk assessment

A brief guide to controlling risks in the workplace



This is a web-friendly version of leaflet INDG163(rev4), published 08/14

This leaflet is aimed at employers, managers and others with responsibility for health and safety. It will also be useful to employees and safety representatives.

Introduction

As part of managing the health and safety of your business, you must control the risks in your workplace. To do this you need to think about what might cause harm to people and decide whether you are taking reasonable steps to prevent that harm.

This is known as risk assessment and it is something you are required by law to carry out. **If you have fewer than five employees you don't have to write anything down.**

A risk assessment is not about creating huge amounts of paperwork, but rather about identifying sensible measures to control the risks in your workplace. You are probably already taking steps to protect your employees, but your risk assessment will help you decide whether you have covered all you need to.

Think about how accidents and ill health could happen and concentrate on real risks – those that are most likely and which will cause the most harm.

For some risks, other regulations require particular control measures. Your assessment can help you identify where you need to look at certain risks and these particular control measures in more detail. These control measures do not have to be assessed separately but can be considered as part of, or an extension of, your overall risk assessment.

Identify the hazards

One of the most important aspects of your risk assessment is accurately identifying the potential hazards in your workplace.

A good starting point is to walk around your workplace and think about any hazards. In other words, what is it about the activities, processes or substances used that could injure your employees or harm their health?

When you work in a place every day it is easy to overlook some hazards, so here are some tips to help you identify the ones that matter:

- **Check manufacturers' instructions** or data sheets for chemicals and equipment as they can be very helpful in explaining the hazards and putting them in their true perspective.

- **Look back at your accident and ill-health records** – these often help to identify the less obvious hazards.
- **Take account of non-routine operations** (eg maintenance, cleaning operations or changes in production cycles).
- **Remember to think about long-term hazards to health** (eg high levels of noise or exposure to harmful substances).
- **Visit the HSE website (www.hse.gov.uk)** – HSE publishes practical guidance on hazards and how to control them.

There are some hazards with a recognised risk of harm, for example working at height, working with chemicals, machinery, and asbestos. Depending on the type of work you do, there may be other risks that are relevant to your business.

Who might be harmed?

Then think **how** employees (or others who may be present, such as contractors or visitors) might be harmed. Ask your employees what they think the hazards are, as they may notice things that are not obvious to you and may have some good ideas on how to control the risks.

For each hazard you need to be clear about who might be harmed – it will help you identify the best way of controlling the risk. That doesn't mean listing everyone by name, but rather identifying groups of people (eg people working in the storeroom or passers-by). Remember:

- Some workers may have particular requirements, eg new and young workers, migrant workers, new or expectant mothers, people with disabilities, temporary workers, contractors, homeworkers and lone workers (www.hse.gov.uk/toolbox/workers).
- Think about people who might not be in the workplace all the time, such as visitors, contractors and maintenance workers.
- Take members of the public into account if they could be harmed by your work activities.
- If you share a workplace with another business, consider how your work affects others and how their work affects you and your workers. Talk to each other and make sure controls are in place.
- Ask your workers if there is anyone you may have missed.

Evaluate the risks

Having identified the hazards, you then have to decide how likely it is that harm will occur, ie the level of risk and what to do about it. Risk is a part of everyday life and you are not expected to eliminate all risks. What you must do is make sure you know about the main risks and the things you need to do to manage them responsibly.

Generally, you need to do everything 'reasonably practicable' to protect people from harm. This means balancing the level of risk against the measures needed to control the real risk in terms of money, time or trouble. However, you do not need to take action if it would be grossly disproportionate to the level of risk.

Your risk assessment should only include what you could reasonably be expected to know – **you are not expected to anticipate unforeseeable risks.**

Look at what you're already doing and the control measures you already have in place. Ask yourself:

- Can I get rid of the hazard altogether?
- If not, how can I control the risks so that harm is unlikely?

Some practical steps you could take include:

- trying a less risky option;
- preventing access to the hazards;
- organising your work to reduce exposure to the hazard;
- issuing protective equipment;
- providing welfare facilities such as first aid and washing facilities;
- involving and consulting with workers.

Improving health and safety need not cost a lot. For instance, placing a mirror on a blind corner to help prevent vehicle accidents is a low-cost precaution, considering the risks. Failure to take simple precautions can cost you a lot more if an accident does happen.

Involve your workers, so you can be sure that what you propose to do will work in practice and won't introduce any new hazards (www.hse.gov.uk/involvement).

If you control a number of similar workplaces containing similar activities, you can produce a model risk assessment reflecting the common hazards and risks associated with these activities.

You may also come across model assessments developed by trade associations, employers' bodies or other organisations concerned with a particular activity. You may decide to apply these model assessments at each workplace, but you can only do so if you:

- satisfy yourself that the model assessment is appropriate to your type of work;
- adapt the model to the detail of your own work situations, including any extension necessary to cover hazards and risks not referred to in the model.

Record your significant findings

Make a record of your significant findings – the hazards, how people might be harmed by them and what you have in place to control the risks. Any record produced should be simple and focused on controls.

If you have fewer than five employees you don't have to write anything down. But it is useful to do this so you can review it at a later date, for example if something changes. If you have five or more employees you are required by law to write it down.

Any paperwork you produce should help you to communicate and manage the risks in your business. For most people this does not need to be a big exercise – just note the main points down about the significant risks and what you concluded.

An easy way to record your findings is to use our risk assessment template (www.hse.gov.uk/risk).

When writing down your results keep it simple, for example 'fume from welding – local exhaust ventilation used and regularly checked'.

A risk assessment must be suitable and sufficient, ie it should show that:

- a proper check was made;
- you asked who might be affected;
- you dealt with all the obvious significant hazards, taking into account the number of people who could be involved;
- the precautions are reasonable, and the remaining risk is low;
- you involved your employees or their representatives in the process.

Where the nature of your work changes fairly frequently or the workplace changes and develops (eg a construction site), or where your workers move from site to site, your risk assessment may have to concentrate more on a broad range of risks that can be anticipated.

Take a look at the selection of example risk assessments on HSE's website (www.hse.gov.uk/risk). They show you what a completed risk assessment might look like for your type of workplace. You can use these as a guide when doing your own.

The site also has online risk assessment tools, to help employers complete and print off their own records.

If your risk assessment identifies a number of hazards, you need to put them in order of importance and address the most serious risks first.

Identify long-term solutions for the risks with the biggest consequences, as well as those risks most likely to cause accidents or ill health. You should also establish whether there are improvements that can be implemented quickly, even temporarily, until more reliable controls can be put in place.

Remember, the greater the hazard the more robust and reliable the measures to control the risk of an injury occurring will need to be.

Regularly review your risk assessment

Few workplaces stay the same. Sooner or later, you will bring in new equipment, substances and procedures that could lead to new hazards. So it makes sense to review what you are doing on an ongoing basis, look at your risk assessment again and ask yourself:

- Have there been any significant changes?
- Are there improvements you still need to make?
- Have your workers spotted a problem?
- Have you learnt anything from accidents or near misses?

Make sure your risk assessment stays up to date.

Find out more

HSE's risk management pages (including templates, as well as risk assessment tools and examples): www.hse.gov.uk/risk

Health and safety made simple: The basics for your business Leaflet INDG449 HSE Books 2011 www.hse.gov.uk/pubns/indg449.htm Microsite: www.hse.gov.uk/simple-health-safety

The health and safety toolbox: How to reduce risks at work HSG268 HSE Books 2014 ISBN 978 0 7176 6587 7 www.hse.gov.uk/pubns/books/hsg268.htm Microsite: www.hse.gov.uk/toolbox

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

This leaflet is available at www.hse.gov.uk/pubns/indg163.htm.

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First published 08/14.

Whole-body vibration in agriculture

HSE information sheet

Agriculture Information Sheet No 20 (Revision 2)

Introduction

This information sheet describes how whole-body vibration (WBV) from agricultural work can cause back pain. It explains what action employers, employees and the self-employed can take to reduce exposure to WBV and comply with their legal duties under health and safety legislation. It should be read in conjunction with the leaflet INDG242(rev1) *Control back-pain risks from whole-body vibration* – see 'Further reading'.

What is whole-body vibration?

WBV is the vibration and shock you feel when you sit or stand on a vehicle or machine travelling over rough ground or along a track, or the vibration when you work near powerful machinery such as milling machines. Shocks can occur, for example, when driving over bumps or potholes. Exposure to WBV at low levels is unlikely on its own to cause back pain, but it can aggravate existing back injuries that may cause pain.

There are many causes of back pain other than WBV: some may be more important than WBV and must be adequately controlled. The most likely cause(s) of back pain should be tackled first – see 'Further reading'.

When is whole-body vibration important?

The Control of Vibration at Work Regulations 2005 (the Vibration Regulations) set an exposure action value (EAV) and an exposure limit value (ELV).

The EAV is 0.5 m/s² A(8) and is the amount of daily exposure to WBV above which you are required to take action to reduce exposure. The ELV is 1.15 m/s² A(8) and should not be exceeded.

People using agricultural machinery are likely to be exposed to vibration above the EAV. In some cases, action may be required to make sure exposure is kept below the ELV (see Table 1). You should not usually need to measure WBV exposures to know where and how the Regulations apply. However, action to

reduce workplace exposure to WBV is required for most operators using most agricultural machinery on at least some days.

What action should I take?

You can control the risks by a combination of:

- identifying how and when people may be exposed;
- minimising the exposure by implementing control measures;
- providing information, instruction and training to those at risk.

The kind of action you need to take varies with the degree of risk. Table 1 gives examples of agricultural tasks split into four groups according to the likely exposure to WBV.

- If you have identified that the work will not reach the EAV (eg Group 1 tasks), or only occasionally exceed it, you need to take the precautionary measures to ensure that exposure is as low as reasonably practicable.
- If exposure is often above the EAV (eg Group 2 and 3 tasks) then you need to make changes to your working practices to reduce exposure. You should also consider modifying or replacing unsuitable machinery.
- HSE recommends health monitoring for Group 3 tasks. Health monitoring can identify and minimise the risk of back pain from all sources, not just WBV.
- If you have taken action and the exposures are still likely to exceed the ELV (eg Group 4 tasks) then you will need to limit how long you spend doing the task.

Exposures for some tasks vary according to the type of holding (arable, livestock, mixed etc). If you operate machinery or perform tasks not listed in Table 1, information may be available from manufacturers, trade associations or elsewhere to help you identify the level of control action required. Exposures should be reduced so far as is reasonably practicable. You may wish to get advice from a person who has the qualifications, knowledge and expertise to help you determine what you need to do.

Table 1 Agricultural tasks grouped according to likely exposure

Group 1: WBV unlikely to be a risk	Group 2: You must manage exposure to WBV	Group 3: WBV is a likely cause of back pain	Group 4: You must restrict exposure to WBV*†
<p>It is unusual for machinery-related tasks in agriculture to fall into this category. Even if machinery is shared among a large workforce and exposure durations are short enough for exposures to be below the EAV, it is highly likely that there will be some exposure to significant shocks.</p>	<ul style="list-style-type: none"> ■ Combining ■ Hedging and ditching ■ Self-propelled foragers ■ Duties requiring use of power take-off shaft not otherwise listed 	<ul style="list-style-type: none"> ■ Baling ■ Drilling ■ Foraging ■ Spraying ■ Ploughing ■ Harrowing ■ Primary cultivation (up to 5½ hours) ■ Mowing (up to 8 hours) ■ Tedding (up to 5 hours) ■ Transport using unsuspended tractors (up to 4½ hours) ■ Transport using tractors with suspended cab or chassis (up to 7 hours) ■ ATV (all-terrain vehicle/quad bike) (up to 5½ hours) 	<ul style="list-style-type: none"> ■ Primary cultivation (over 5½ hours) ■ Mowing (over 8 hours) ■ Tedding (over 5 hours) ■ Transport using unsuspended tractors (over 4½ hours) ■ Transport using tractors with suspended cab or chassis (over 7 hours) ■ ATV (all-terrain vehicle/quad bike) (over 5½ hours)

Group 1: WBV unlikely to be a risk

- Exposure is likely to be below the EAV with no significant shocks.
- Low-cost vibration-reduction measures and management of WBV will reduce maintenance and the likelihood of back pain.

Group 2: You must manage exposure to WBV

- Exposures are likely to exceed the EAV on at least some days, but shocks are expected to be small.
- The risk of back pain from WBV is likely to be low and back pain is more likely to be caused by other factors.
- You must have low-cost vibration-reduction and management measures in place, but costly or difficult measures are unlikely to be reasonably practicable.

Group 3: WBV is a likely cause of back pain

- Exposures are likely to be much higher than the EAV and/or contain large shocks.
- You must have effective engineering and management controls.
- Health monitoring is recommended to confirm that the risk from WBV is under control.

Group 4: You must restrict exposure to WBV*†

- To comply with the ELV you must restrict how long people are exposed to WBV.

* A transitional period permits older agricultural machinery to continue in use until 2014, with operators exposed in excess of the ELV, so long as exposure is reduced so far as is reasonably practicable.

† Investigation of your specific activities may, in some cases, show that the tasks can continue for longer than stated.

Controls to reduce the risk from WBV

Low-cost vibration-reduction and management measures

- Find out what steps you can take to reduce shock, such as following good practice when driving over headlands or adequate maintenance of tracks.
- Find out what you can do to reduce vibration, such as limiting speed or good maintenance of machinery suspensions.
- Ask for vibration information when purchasing or hiring machinery.
- Maintain machinery in accordance with the manufacturer's recommendations.

Construction and maintenance of farm tracks

- Design, construct and maintain roadways and other vehicle manoeuvring areas to a high standard, according to the machinery that will use them.
- Repair potholes and other roadway damage and keep roadways clear of debris to avoid shocks.
- Design road cambers to avoid or minimise poor posture.
- Good drainage will help reduce deterioration.

Maintenance and adjustment of seats

- Machine manufacturers/suppliers must ensure the seat adjustment controls are readily accessible and easy to use.
- Incorrect seat adjustment is often the source of poor posture and unnecessary vibration.
- Check, lubricate and maintain seat suspensions (and cab and chassis suspensions) as recommended by the manufacturer.

Seat suspension components (especially the damper) may need periodic replacement. Inspect the seat assembly regularly for defects. The damper is likely to be defective if the seat easily hits the bottom end-stops while driving over relatively smooth terrain with the weight control correctly set or, when the machine is parked, if the seat cushion is easily pushed into the end-stops, for example with your knee.

Replacement seats

Many popular agricultural vehicle brands are supplied with air or mechanical suspension seats. Suspension seat mechanisms may wear out during the life of the machine. Replacement seats need to take account of factors such as roll-over protective structures (ROPS) and seatbelts as well as vibration.

The damping in some suspension seats is too light for the chosen use of the machine. Modifications of seat suspensions should be made only in discussion with the manufacturers of both the seat and the machine. For example, fitting a heavier damper will often reduce exposure to shock from end-stop impacts, and extend damper life, but will increase the average vibration.

Seats are available with fore-aft as well as vertical suspension. Fore-aft vibration can be important in applications such as tractor-trailer transport, or many self-propelled foragers and sprayers. It is advisable to try a machine with a fore-aft suspension seat before buying. These seats can be effective in reducing vibration.

Selecting suitable machinery

You should make sure that machinery is suitable for the intended task and will not cause unnecessary vibration exposure – using under-sized or under-powered machines is likely to increase exposure to WBV and shock.

When purchasing or hiring in machinery other than agricultural tractors, you should ask for information about how to use the machinery without risk from WBV. Manufacturers/suppliers have been obliged to provide this information since 1996.

Agricultural tractors must meet the vibration specification for the seat prescribed according to a standard test. However, you will still need to follow the guidelines in this information sheet to comply with the Vibration Regulations.

Vibration can change markedly from task to task, operator to operator, and day to day, so there is always a relatively wide range of vibration for a machine or task. Within this range, the vibration of directly competing machines is often the same. However, if you find out that there are large differences in the vibration of machines, choose the machine with the lowest WBV emission levels as long as the machines are otherwise equivalent.

All-terrain vehicles (ATVs)

Riders of ATVs such as quad bikes are exposed to very high levels of WBV. The risk of injury from riding quad bikes is unclear because the posture and muscle tone of the rider (whether seated or standing) is very different to that of a driver seated in a conventional agricultural machine. Even so, the exposure action and limit values of the Vibration Regulations still apply – both at the seat and at the footrests.

The common practice of standing on the footrest with bent knees, for example when crossing rough ground, appears likely to reduce the transmission of vibration into the driver's back and so reduces the risk of causing back pain compared to sitting on the seat.

Field work: Headlands

Most vibration and shock during field working occur at headlands where you are driving over unworked land or across tramlines. The higher levels of vibration at headlands will often contribute only slightly more to the daily vibration exposure because of the short time spent there, compared with that spent working the main field (with lower vibration).

However, the risk from shock is unlikely to average out between headland work and work in the main field because each shock could have the potential to cause microscopic damage which might add up over time to pain or injury. The risk from shock could be increased when in an awkward posture, for example when the driver is twisted or leaning to one side as the machine makes uneven progress across ruts.

Try not to spend a large proportion of a day working around headlands and plan cultivation work to minimise sources of shock.

Travelling on roads

Most agricultural machinery produces its highest vibration when travelling on roads, usually because it is being driven at a relatively high speed. In most cases, this contributes only a small part to the overall daily exposure because the duration of travel to, from, or between fields is usually only a small part of the working day.

An exception is hauling a trailer, where vibration is high and the duration can be many hours. This may be the most common cause of exposures exceeding the ELV.

To reduce the risks, consider introducing limits on the time spent by individual operators driving on roads, as well as moderating vehicle speed.

Information and training for workers

A competent and skilled farm worker who drives in a smooth and controlled manner will often generate lower exposure to vibration than a less skilled worker or someone working under pressure. Train machine

operators in how to minimise WBV from the machinery they use and give them information on:

- the health risks from WBV, eg lower back pain;
- how to correctly adjust and set the driver's seat on machines they use;
- methods of work to reduce risks (such as choice of speed and route to be followed);
- the tasks/situations where risks are increased;
- how to recognise and report symptoms associated with WBV.

Monitor and control

All mobile agricultural machinery has the potential to cause exposure in excess of the ELV if controls are not implemented and followed. Actual exposures are usually between the EAV and ELV so controls are necessary and must be maintained.

Measures such as restricting how long machines are used, route planning, reducing travelling speed and monitoring driver behaviour may be required to reduce vibration exposure to below the ELV, in addition to the control measures above.

Using job rotation as a control action may actually increase the number of workers at risk because large shocks, especially if your back is twisted, can cause microscopic but permanent injury. Before job rotation is introduced, it is important that the risk of being exposed to large shocks is reduced or removed.

Further reading

Control back-pain risks from whole-body vibration: Advice for employers on the Control of Vibration at Work Regulations 2005 Leaflet INDG242(rev1) HSE Books 2005 www.hse.gov.uk/pubns/indg242.pdf

Manual handling at work: A brief guide Leaflet INDG143(rev3) HSE Books 2012 www.hse.gov.uk/pubns/indg143.htm

Manual handling assessment charts Leaflet INDG383(rev1) HSE Books 2012 www.hse.gov.uk/pubns/indg383.htm

Whole-body vibration. The Control of Vibration at Work Regulations 2005. Guidance on Regulations L141 HSE Books 2005 ISBN 978 0 7176 6126 8 www.hse.gov.uk/pubns/books/L141.htm

Non-binding guide to good practice for implementing Directive 2002/44/EC (Vibrations at work) European Commission ISBN 978 92 79 07533 9 Order or download free at www.bookshop.europa.eu

You can get further information on whole-body vibration from the HSE website:
www.hse.gov.uk/vibration

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

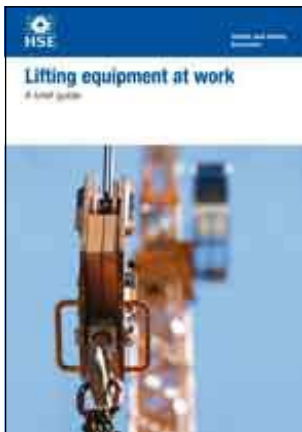
This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

This leaflet is available at:
www.hse.gov.uk/pubns/ais20.htm.

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Lifting equipment at work

A brief guide



This is a web-friendly version of leaflet INDG290(rev1), published 03/13

Introduction

This leaflet provides general information about the requirements of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER). It describes what you, as an employer, may need to do to protect your employees in the workplace. It will also be useful to employees and their representatives.

However, it is important that you also refer to the Regulations and Approved Code of Practice to familiarise yourself fully with your duties.

What equipment is covered by the Regulations?

Lifting equipment includes any equipment used at work for lifting or lowering loads, including attachments used for anchoring, fixing or supporting it. The Regulations cover a wide range of equipment including, cranes, forklift trucks, lifts, hoists, mobile elevating work platforms, and vehicle inspection platform hoists. The definition also includes lifting accessories such as chains, slings, eyebolts etc. LOLER does not apply to escalators, which are covered more specifically by the Workplace (Health, Safety and Welfare) Regulations 1992.

If you allow employees to provide their own lifting equipment, then this too is covered by and should comply with the Regulations.

Do the Regulations apply to me?

If you are an employer or self-employed person providing lifting equipment for use at work, or you have control of the use of lifting equipment, then the Regulations will apply to you. They **do not** apply if you provide equipment to be **used primarily by members of the public**, for example lifts in a shopping centre. However, such circumstances are covered by the Health and Safety at Work etc Act 1974 (HSW Act).

While your employees **do not** have specific duties under LOLER, they do have general duties under the HSW Act and the Management of Health and Safety at Work Regulations 1999 (the Management Regulations), for example to take reasonable care of themselves and others who may be affected by their actions and to co-operate with others.

The Regulations cover workplaces where the HSW Act applies – this includes factories, offshore installations, agricultural premises, offices, shops, hospitals, hotels, places of entertainment etc.

What do the Regulations require me to do?

You need to make sure that when using any lifting equipment the requirements of LOLER are met. For example, you should make sure that all lifting equipment is:

- sufficiently strong, stable and suitable for the proposed use. Similarly, the load and anything attached (eg timber pallets, lifting points) must be suitable;
- positioned or installed to prevent the risk of injury, eg from the equipment or the load falling or striking people;
- visibly marked with any appropriate information to be taken into account for its safe use, eg safe working loads. Accessories, eg slings, clamps etc, should be similarly marked.

Additionally, you must make sure that:

- lifting operations are planned, supervised and carried out in a safe manner by people who are competent;
- where equipment is used for lifting people it is marked accordingly, and it should be safe for such a purpose, eg all necessary precautions have been taken to eliminate or reduce any risk;
- where appropriate, before lifting equipment (including accessories) is used for the first time, it is thoroughly examined. Lifting equipment may need to be thoroughly examined in use at periods specified in the Regulations (ie at least six-monthly for accessories and equipment used for lifting people and, at a minimum, annually for all other equipment) or at intervals laid down in an examination scheme drawn up by a competent person. All examination work should be performed by a competent person (someone with the necessary skills, knowledge and experience);
- following a thorough examination or inspection of any lifting equipment, a report is submitted by the competent person to the employer to take the appropriate action.

Why is lifting equipment safety important?

Working with any machinery can be dangerous because moving machinery can cause injuries in many ways:

- People can be hit and injured by moving parts of machinery or dropped or ejected material. Parts of the body can also be drawn in or trapped between rollers, belts, chains and pulley drives.
- Sharp edges can cause cuts and severing injuries, sharp-pointed parts can stab or puncture the skin, and rough surface parts can cause friction or abrasion.
- People can be crushed both between parts moving together or towards a fixed part of the machine, wall or other object, and two parts moving past one another can cause shearing.
- Parts of the machine, materials and emissions (such as steam or water) can be hot or cold enough to cause burns or scalds and electricity can cause electrical shock and burns.
- Equipment or attachments can become unreliable and develop faults due to poor or no maintenance, or machines may be used improperly through inexperience or lack of training.
- Parts of the equipment may fail and loads may drop.

Before you start

Before you start using any equipment you need to think about what risks may occur and how these can be managed. You should:

- Check that it is complete, with all safeguards fitted, and free from defects.
- Produce a safe system of work for using and maintaining the equipment. Maintenance may require the inspection of critical features where deterioration would cause a risk. Also look at the residual risks identified by the manufacturer in their information/instructions provided with the equipment and make sure they are included in the safe system of work.
- Make sure the equipment has been installed properly, is stable and is not in a location where other workers, customers or visitors may be exposed to risk.
- Make sure you have chosen the right equipment for the job.

Note that new equipment should be CE marked and be supplied with a Declaration of Conformity and instructions in English.

Make sure the equipment is:

- safe for any work that has to be done when setting up, during normal use, when carrying out repairs for breakdowns or faults, and during planned maintenance;
- properly switched off, isolated or locked-off before taking any action to remove blockages, clean or adjust the equipment.

Also, make sure you identify and deal with the risks from:

- electrical, hydraulic or pneumatic power supplies;
- badly designed safeguards. These may be inconvenient to use or easily overridden, which could encourage your workers to risk injury and break the law. If they are, find out why they are doing it and take appropriate action to deal with the reasons/causes.

Preventing access to dangerous parts

Think about how you can make the equipment safe; the measures you use to prevent access to dangerous parts should be in the following order. In some cases it may be necessary to use a combination of these measures:

- Use fixed guards (eg secured with screws or nuts and bolts) to enclose the dangerous parts, whenever practicable. Use the best material for these guards – plastic may be easy to see through but may easily be damaged. Where you use wire mesh or similar materials, make sure the holes are not large enough to allow access to moving parts.
- If fixed guards are not practicable, use other methods, eg interlock the guard so that the equipment cannot be started before the guard is closed and cannot be opened while the machine is still moving. In some cases, trip systems (such as photoelectric devices, pressure-sensitive mats or automatic guards) may be used if other guards are not practicable.
- Where guards cannot give full protection, use jigs, holders, push sticks etc if it is practicable to do so.
- Control any remaining risk by providing the operator with the necessary information, instruction, training, supervision and appropriate safety equipment.

Other things you should consider

- Make sure control switches are clearly marked to show what they do.
- Have emergency stop controls where necessary, eg mushroom-head push buttons within easy reach.
- Make sure operating controls are designed and placed to avoid accidental operation and injury. Use two-hand controls where necessary and shroud start buttons and pedals.
- Do not let unauthorised, unqualified or untrained people use lifting equipment – never allow children to operate or help with lifting equipment. Some workers, eg new starters, young people or those with disabilities, may be particularly at risk and need instruction, training and supervision.
- Adequate training should ensure that those who use the equipment are competent to use it safely (they have the necessary skills, knowledge and experience), and are physically suited to the task.
- Make sure the work area around the equipment is kept clean and tidy, free from obstructions or slips and trips hazards, and well lit.

Dos and don'ts of equipment safety

As the dutyholder you should make sure that all employees likely to use lifting equipment, understand and follow these dos and don'ts:

Do...

- ✓ check the equipment is well maintained and fit to be used, ie appropriate for the job, working properly and all the safety measures are in place;
- ✓ make sure all parts, including attachments, can accommodate the load weight;
- ✓ use the equipment properly and in accordance with the manufacturer's instructions;
- ✓ make sure employees are wearing the appropriate protective clothing and equipment, required for that machine, such as safety glasses, head protection and safety shoes.

Don't...

- ✗ use equipment that has a danger sign or tag attached to it. Danger signs should only be removed by an authorised person who is satisfied that the equipment or process is now safe;
- ✗ remove any safeguards, even if their presence seems to make the job more difficult;
- ✗ wear dangling chains, loose clothing, rings or have loose long hair that could get caught up in moving parts;
- ✗ distract people who are using equipment.

Safe lifting by machine

If you are an employer or a self-employed person providing lifting equipment for use at work, or if you have control of the use of lifting equipment, you must make sure it is safe. Think about what risks there may be and how they can be managed. For example:

- damage or deterioration of the equipment or attachments caused by wet, abrasive or corrosive environments;
- trying to move weights that are too heavy and exceed the load limit of the machine;
- equipment failure;

- untrained workers planning the lift or using the equipment;
- people being struck by moving parts of the equipment or by things falling.

Safe lifting needs to be properly planned by a competent person, appropriately supervised and carried out safely. Any equipment you use must have been properly designed, manufactured and tested. Don't forget maintenance.

Factors you should consider

- What are you lifting, and what problems does it present?
- How heavy is it, and is this within the safe limits for the lifting gear?
- Where is its centre of gravity?
- How will you attach it to the lifting machinery?
- Who is in control of the lift?
- Could you rehearse the lift if necessary?

Dos and don'ts of lifting safely

Do:

- ✓ use only certified lifting equipment, marked with its safe working load, which is not overdue for examination;
- ✓ keep the reports of thorough examination as well as any declarations of conformity or test certificates;
- ✓ make sure the load is properly attached to the lifting equipment. If necessary, securely bind the load to prevent it slipping or falling off;
- ✓ before lifting an unbalanced load, find out its centre of gravity. Raise it a few inches off the ground and pause – there will be little harm if it drops;
- ✓ use packaging to prevent sharp edges of the load from damaging slings and do not allow tackle to be damaged by being dropped, dragged from under loads or subjected to sudden loads;
- ✓ when using jib cranes, make sure any indicators for safe loads are working properly and set correctly for the job and the way the machine is configured;
- ✓ use outriggers where necessary;
- ✓ when using multi-slings make sure the sling angle is taken into account;
- ✓ have a responsible slinger or banksman and use a recognised signalling system.

Don't...

- ✗ use unsuitable equipment, eg makeshift, damaged, badly worn chains shortened with knots, kinked or twisted wire ropes, frayed or rotted fibre ropes;
- ✗ exceed the safe working load of machinery or accessories like chains, slings and grabs. Remember that the load in the legs of a sling increases as the angle between the legs increases;
- ✗ lift a load if you doubt its weight or the adequacy of the equipment.

Equipment maintenance

Why is maintenance of equipment important?

Additional hazards can occur when equipment becomes unreliable and develops faults. Maintenance allows these faults to be diagnosed early and corrected to manage any risks. However, maintenance needs to be correctly planned and carried out. Unsafe maintenance has caused many fatalities and serious injuries either during the maintenance or to those using the badly or wrongly maintained/ repaired equipment.

An effective maintenance programme will make equipment more reliable. Fewer breakdowns will mean less dangerous contact with equipment is required, as well as having the cost benefits of better productivity and efficiency.

LOLER requires lifting equipment to be maintained so that it remains safe and that maintenance is carried out safely.

What do I have to do?

If you are an employer and you provide lifting equipment you need to demonstrate that you have arrangements in place to make sure they are maintained in a safe condition.

Think about what hazards can occur:

- if equipment or an attachment breaks during use;
- equipment starts up unexpectedly;
- there is contact with materials that are normally enclosed within the machine, ie caused by leaks/breakage/ejection etc;
- if a load or part of a load falls.

Failing to correctly plan and communicate clear instructions and information before starting maintenance can lead to confusion and can cause accidents. This can be a particular problem if maintenance is carried out during normal production work or where there are contractors who are unfamiliar with the site.

Extra care is also required if maintenance involves:

- working at height or when doing work that requires access to unusual parts of the building;
- entering vessels or confined spaces where there may be toxic materials or a lack of breathable air.

How can I do it?

Establish a planned maintenance programme and a reporting procedure for workers who may notice problems while working on machinery.

Some items of equipment may have safety-critical features where deterioration would cause a risk. You must have arrangements in place to make sure the necessary inspections take place.

But there are other steps to consider:

Before you start maintenance

- Decide if the work should be done by specialist contractors. Never take on work for which you are not competent or not prepared.
- Plan the work carefully before you start, ideally using the manufacturer's maintenance instructions, and produce a safe system of work. This will reduce the risks and avoid unforeseen delays.
- Make sure maintenance staff are competent and have appropriate clothing and equipment.
- Try and use downtime for maintenance. You can avoid the difficulties in co-ordinating maintenance and lost production if maintenance work is performed before start-up or during shutdown periods.

Safe working areas

- You must provide safe access and a safe place of work.
- Don't just focus on the safety of maintenance workers – take the necessary precautions to ensure the safety of others who may be affected by their work, eg other employees or contractors working nearby.
- Set up signs and barriers and position people at key points if they are needed to keep other people out.

How do the Regulations relate to other health and safety legislation?

The requirements of the Regulations need to be considered alongside other health and safety law. For example, section 2 of the HSW Act requires all employers to ensure, so far as is reasonably practicable, the health, safety and welfare of all their employees. Similarly, the Management Regulations contain important duties which relate to the carrying out of a risk assessment to identify measures that you can take to eliminate, or reduce, the risks presented by the particular hazards in your workplace (see Further information).

Other more specific legislation, for example the Personal Protective Equipment at Work Regulations 1992, may also apply. Under these particular Regulations there may be a need to provide a safety harness for rope access work during activities such as window cleaning.

Further reading

Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and guidance L113 HSE Books 1998
ISBN 978 0 7176 1628 2 www.hse.gov.uk/pubns/books/l113.htm

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Third edition)
HSE Books 2008 ISBN 978 0 7176 6295 1 www.hse.gov.uk/pubns/books/l22.htm

Providing and using work equipment safely: A brief guide to the law Leaflet INDG291(rev1) HSE Books 2013 www.hse.gov.uk/pubns/indg291.htm

Managing health and safety: Five steps to success Leaflet INDG275
HSE Books 1998 www.hse.gov.uk/pubns/indg275.htm

Buying new machinery: A short guide to the law and your responsibilities when buying new machinery for use at work Leaflet INDG271(rev1) HSE Books 2011
www.hse.gov.uk/pubns/indg271.htm

Workplace transport safety: An employers' guide HSG136 (Second edition)
HSE Books 2005 ISBN 978 0 7176 6154 1 www.hse.gov.uk/pubns/books/hsg136.htm

Workplace transport safety: A brief guide Leaflet INDG199(rev1) HSE Books 2013
www.hse.gov.uk/pubns/indg199.htm

Hiring and leasing out of plant: Application of PUWER 98, regulations 26 and 27
MISC156 HSE Books 1998 www.hse.gov.uk/pubns/9204.pdf

Risk management web pages: www.hse.gov.uk/risk/

Further information

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This leaflet is available at www.hse.gov.uk/pubns/indg290.htm.

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LOLER: How the Regulations apply to forestry

Agriculture Information Sheet No 29

Introduction

This information sheet gives advice to people working in forestry to help them understand the requirements of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER). These requirements came into force on 5 December 1998.

The requirements of LOLER apply to employers, the self-employed and people in control of or managing operations which involve lifting.

LOLER is aimed at ensuring that all lifting operations are properly planned, that lifting equipment is used in a safe manner and that, where necessary, lifting equipment is thoroughly examined at suitable intervals by a competent person.

This information sheet *does not* include all of the detail of the Regulations. It aims to provide guidance **on mobile forestry machines which lift as part of their function.**

Details of the complete LOLER Regulations, Approved Code of Practice and Guidance can be found in the 'References' section.¹

Other key legislation

LOLER has links with other health and safety legislation which you need to consider when applying the Regulations.

Management of Health and Safety at Work Regulations 1999 (MHSWR)

The MHSWR require a risk assessment to be carried out to identify the nature and level of the risks associated with a lifting operation. Factors that you need to consider include:

- the type of load being lifted;
- the risk of it falling and striking a person;
- the risk of the lifting equipment striking a person;
- the risk of the lifting equipment failing or falling over in use.

You should assess the risks for each type of lifting equipment and the way it is used in your business, and

take action to control the risks. Risks from lifting operations identified by the risk assessment should be eliminated, or reduced to an acceptable level by applying LOLER.

Provision and Use of Work Equipment Regulations 1998 (PUWER 98)

PUWER 98 applies to all work equipment including lifting equipment. Under PUWER 98 you are required to select suitable work equipment in terms of:

- its construction and design;
- where it is to be used; and
- the purpose for which it is to be used.

Lifting Operations and Lifting Equipment Regulations (LOLER) 1998

What is lifting equipment in forestry?

Any equipment that lifts or lowers loads, including:

- processing machines that lift as part of their function, such as tree harvesters, bed processors;
- extraction machines that lift as part of their function, such as cable cranes;
- machines fitted with log loaders, such as forwarders and clambunk skidders.

What is not lifting equipment in forestry?

Wire rope skidders are not considered to be lifting equipment under normal conditions of use.

The three-point linkage on a forest tractor will not be considered as lifting equipment if used to lift implements and machines designed to be operated as such on a tractor.

Strength

LOLER requires you to make sure that your lifting equipment will be strong enough for its proposed use. This should not be a problem for forestry machines when used for their normal design purpose, ie handling trees and timber. When used for other purposes you should assess that they are strong enough for the job. This would include activities such as:

- lifting grab tanks for fuel, oil or urea;
- lifting items with chains, slings or hooks;
- lifting unusual loads such as pipes for culvert building etc.

Stability

In the same way, LOLER requires you to ensure that your lifting equipment will not collapse or overturn when working. The risk of this happening during forestry operations can be reduced by:

- selecting equipment appropriate for the products to be handled given the slope and terrain of the forestry work site;
- training operators in the limitations of the machine;
- planning the harvesting pattern and extraction routes to avoid lifting on side slopes;
- ensuring tyres are inflated to the correct pressure;
- using stabilising equipment such as outriggers and articulation brakes/locks;
- locating cable crane winch units on level ground with suitable points for anchoring;
- selecting trees of adequate strength with suitable points of anchorage to rig cable cranes;
- selecting firm and level areas for timber stacks.

The load and anything attached to it should also be of adequate strength. This would, for example, apply to the bar on a grab tank designed to be clasped by the grapple of a log loader.

Lifting equipment for lifting people

See the HSE information sheet on LOLER and arboriculture (AIS30² available free from HSE Books).

Positioning and installation

Lifting equipment should be positioned and installed to reduce to as low as reasonably practicable the risk of the equipment or the load striking people or the risk from the load drifting, falling freely or being released unintentionally.

Lifting equipment should be positioned to minimise the need to lift loads over people. Check that:

- cable cranes are located so that operators and others are not exposed to unacceptable risks from the crane, the loads carried by the crane or by secondary lifting/processing operations at the landing area;

- where timber is being lifted on or near areas to which the public have access, effective measures have been taken to prevent unauthorised access to the work area.

Lifting equipment should be fitted with suitable devices to minimise the risk from the load falling freely. Make sure that:

- cable cranes extracting downhill have a suitable device to protect against the uncontrolled descent of the load if the hauling cables are overloaded (for example, an emergency control which lowers the skyline or a suitably rated safety stop between the carriage and the haul-back line);
- chokers on cable cranes are self-tightening or can be adjusted to keep the load securely attached.

Marking of lifting equipment

Information on the safe working load of any machine or accessory used for lifting should be available to the operator.

Where lifting machines have a fixed configuration, the safe working load (SWL) should be marked on the machine.

Where the SWL depends on the machine's configuration, then the operator will need information to keep both machine and loads within the safe working limits for any particular configuration.

- Cable crane operators should have a chart showing the safe working load of the machine for the rack length depending on the strength of the cables used on the machine (these calculations should be discussed and agreed with the chokerman before work on the rack starts).
- Operators of equipment fitted with log loaders should have a chart or diagram (clearly visible at the operating position) that shows the SWL for any radius of the loader such as a safe working load plate or a load radius diagram.

Accessories should be marked with any information needed for their safe use. The use of labels or colour coding is acceptable. Examples of this in forestry include:

- where polypropylene chokers of different strengths are used they will need to be distinguishable from each other;
- slings, shackles etc used in the rigging and support of cable cranes should have their SWL marked.

Organisation of lifting operations

Lifting operations should be properly planned, appropriately supervised and carried out in a safe manner. It is particularly important that:

- people planning a lifting operation should have adequate practical and theoretical knowledge and experience of planning similar lifting operations;
- you organise the work so that, where practicable, loads are not carried or suspended over people;
- where possible people should not walk or stand under loads that have been left suspended;
- your workers have appropriate training and instructions so that they can ensure that lifting equipment is safe to use.

Thorough examination

Lifting equipment may need to be thoroughly examined:

- when it is put into service;
- following major refurbishment or repair;
- after installation at a new location; and
- at suitable intervals to detect deterioration arising from wear and tear.

(NB Initial thorough examination is not required where the machine has an EC declaration of conformity less than 12 months old.)

Thorough examination is to protect both operators and people in the vicinity of lifting operations who may be at risk if lifting equipment suddenly failed.

Equipment should be thoroughly examined where it lifts loads over people.

Equipment does not need to be thoroughly examined where it does not lift loads over people and where the operators of equipment are protected by:

- a roll over protective structure (ROPS); or
- a tip over protective structure (TOPS);

combined with:

- a falling object protective structure (FOPS); and
- an operator protective structure (OPS).

Working to the above criteria, normally, machines such as:

- cable cranes and forestry machines that lift as part of their function without appropriate protective structures (whether purpose-built or adapted from other industries) will require thorough examination;
- tree harvesters and forwarders with appropriate protective structures **will not** require thorough examination.

However, you should assess your equipment and working practices for the risks involved and decide which items have to undergo thorough examination.

Where lifting equipment is assessed as needing thorough examination, you should ensure that it is done:

- the first time it is put into service (unless it has not been used before **and** has an EC declaration of conformity not more than 12 months old);
- at intervals of:
 - either every six months for any equipment used for lifting people, and all accessories (such as chains and slings) and every twelve months for other lifting equipment; or
 - in either of the above cases, in accordance with the time intervals in an examination scheme prepared by a competent person;
- each time that exceptional circumstances occur which are liable to jeopardise the safety of the lifting equipment (for example, following a repair or a major failure).

LOLER requires lifting equipment to be thoroughly examined when it is installed in a new location. However, the rigging of cable cranes is regarded as moving or repositioning and not 'installation' as covered by this regulation. They **do not** have to be thoroughly examined each time they move to a new rack or site.

Thorough examination will normally be carried out by an independent competent person from outside your business, such as an engineer from the supplier or manufacturer of the equipment or an independent examining engineer from an insurance company or specialist forestry engineering company.

You should ensure that the person chosen to act as the competent person for the thorough examination has the appropriate practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined which will enable them to detect defects or weaknesses which it is the purpose of the examination to discover. Also they should be able to assess their importance in relation to the safety and continued use of the particular equipment.

When forestry equipment subject to thorough examination is contracted to be used in the business of another employer, then a copy of the equipment's current thorough examination report should be available.

Inspection

LOLER also requires machines that are thoroughly examined to be regularly inspected to detect wear and tear that may make the equipment unsafe to use. Such inspections can be carried out by a competent operator. It is recommended that:

- forestry machines that are thoroughly examined are inspected once a week or every 50 working hours if the machine has worked less than 50 hours in that week;
- all forestry machines that lift as part of their function, whether they are thoroughly examined or not, are inspected as above.

Reports and defects

A person making a thorough examination for an employer should notify defects and make a report of the examination.

The competent person should notify the employer immediately of any defect which in their opinion is or could become a danger to people. They should also send a copy of the report to HSE where they consider there is an imminent risk of serious personal injury.

If you are notified of a defect you should ensure that the lifting equipment is not used before the defect is rectified or that it is rectified within the time specified in the report.

Operators carrying out inspections should report any defect in the equipment which in their opinion could become a danger to people and as soon as practicable make a record of the inspection in writing.

Records

Copies of EC declarations of conformity for any lifting equipment should be kept as long as the equipment remains in use.

Information contained in any thorough examination report should be kept available for inspection.

References

1 *Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and Guidance L113 HSE Books 1998 ISBN 0 7176 1628 2*

2 *LOLER: How the Regulations apply to arboriculture AIS30 HSE Books 1998*

Further information

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: 01787 881165 Fax: 01787 313995. Website: www.hsebooks.co.uk

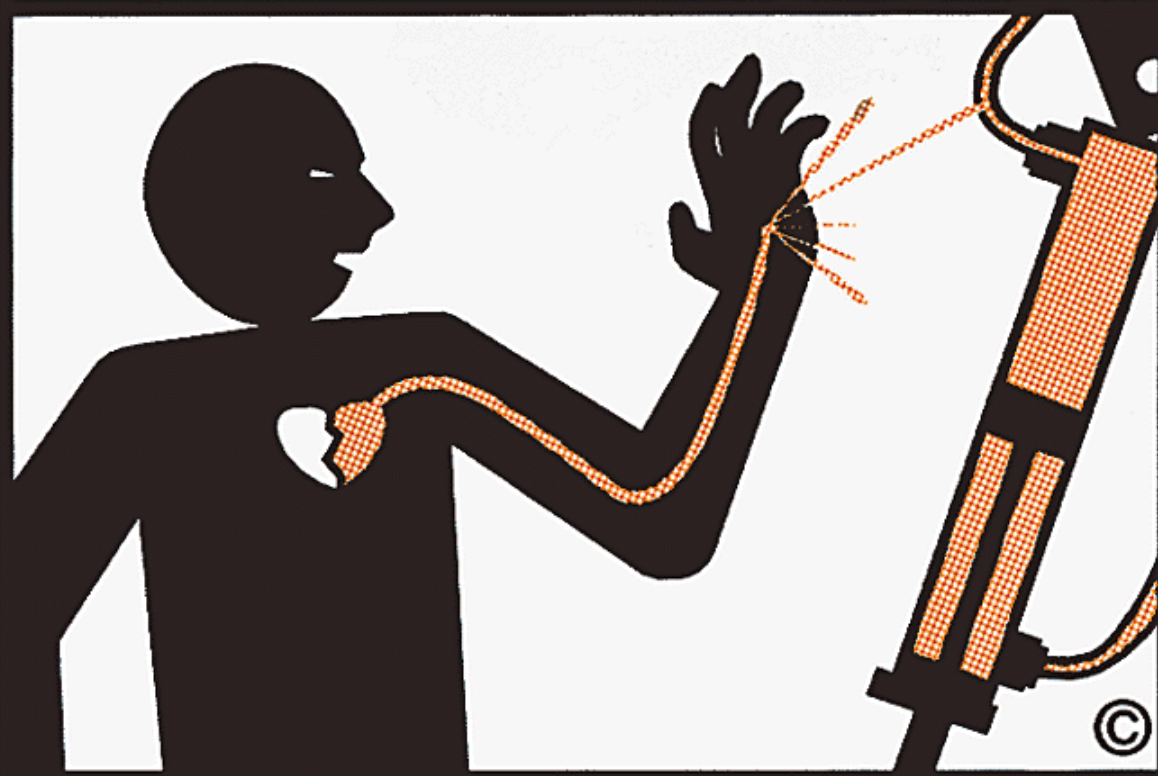
HSE priced publications are also available from good booksellers.

For other enquiries ring HSE's InfoLine Tel: 0871 545500, or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ. Website: www.hse.gov.uk

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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WARNING



DO NOT GO NEAR LEAKS

- **High pressure oil easily punctures skin causing serious injury, gangrene or death.**
- **If injured, seek emergency medical help. Immediate surgery is required to remove oil.**
- **Do not use finger or skin to check for leaks.**
- **Lower load or relieve hydraulic pressure before loosening fittings.**

10813A

Providing and using work equipment safely

A brief guide



This is a web-friendly version of leaflet INDG291(rev1), published 03/13

Introduction

This leaflet provides an outline of the requirements of the Provision and Use of Work Equipment Regulations 1998 (PUWER) and describes what you, as an employer, may need to do to protect your employees in the workplace. It will also be useful to employees and their representatives.

There may be particular requirements on the equipment you use at work; where this is the case the leaflet will point you towards further information you may need.

What equipment is covered by the Regulations?

Generally, **any equipment** which is **used by an employee at work** is covered, for example hammers, knives, ladders, drilling machines, power presses, circular saws, photocopiers, lifting equipment (including lifts), dumper trucks and motor vehicles. Similarly, if you allow employees to provide their own equipment then it will also be covered by PUWER and you will need to make sure it complies.

Examples of uses of equipment which are covered by the Regulations include starting or stopping the equipment, repairing, modifying, maintaining, servicing, cleaning and transporting.

Do the Regulations apply to me?

If you are an employer or self-employed person and you provide equipment for use at work, or if you have control of the use of equipment, then the Regulations will apply to you.

They **do not** apply to equipment used by the public, for example compressed-air equipment used in a garage forecourt. However, such circumstances are covered by the Health and Safety at Work etc Act 1974 (HSW Act).

The Regulations cover workplaces where the HSW Act applies – this includes factories, offshore installations, offices, shops, hospitals, hotels, places of entertainment etc. PUWER also applies in common parts of shared buildings and temporary places of work such as construction sites.

While the Regulations cover equipment used by people working from home, they do not apply to domestic work in a private household.

What do the Regulations require me to do?

You must **ensure** that the work equipment you provide meets the requirements of PUWER. You should ensure that it is:

- **suitable** for use, and for the purpose and conditions in which it is to be used;
- **maintained** in a safe condition for use so that people's health and safety is not at risk; and
- **inspected**, in certain circumstances, to ensure that it is and continues to be safe for use. Any inspection should be carried out by a competent person (this could be an employee if they have the necessary skills, knowledge and experience to perform the task) and a record kept until the next inspection.

You should also ensure that risks created by using the equipment are eliminated where possible or controlled as far as reasonably practicable by:

- taking appropriate **'hardware' measures**, eg providing suitable guards, protection devices, markings and warning devices, system control devices (such as emergency stop buttons) and personal protective equipment; and
- taking appropriate **'software' measures** such as following safe systems of work (eg ensuring maintenance is only performed when equipment is shut down etc), and providing adequate information, instruction and training about the specific equipment.

A combination of these measures may be necessary depending on the requirements of the work, your assessment of the risks involved, and the practicability of such measures.

Machinery

Why is machinery safety important?

Working with machinery can be dangerous because moving machinery can cause injuries in many ways:

- People can be hit and injured by moving parts of machinery or ejected material. Parts of the body can also be drawn into or trapped between rollers, belts and pulley drives.
- Sharp edges can cause cuts and severing injuries, sharp-pointed parts can stab or puncture the skin, and rough surface parts can cause friction or abrasion.
- People can be crushed both between parts moving together or towards a fixed part of the machine, wall or other object, and two parts moving past one another can cause shearing.
- Parts of the machine, materials and emissions (such as steam or water) can be hot or cold enough to cause burns or scalds and electricity can cause electrical shock and burns.
- Injuries can also occur due to machinery becoming unreliable and developing faults due to poor or no maintenance or when machines are used improperly through inexperience or lack of training.

Before you start

Before allowing someone to start using any machine you need to think about what risks there are and how these can be managed. You should:

- Check that it is complete, with all safeguards fitted, and free from defects. The term 'safeguard' includes guards, interlocks, two-hand controls, light guards,

pressure-sensitive mats etc. By law, the supplier must provide the right safeguards and inform buyers of any risks ('residual risks') that users need to be aware of and manage because they could not be designed out.

- Produce a safe system of work for using and maintaining the machine. Maintenance may require the inspection of critical features where deterioration would cause a risk. Also look at the residual risks identified by the manufacturer in the information/instructions provided with the machine and make sure they are included in the safe system of work.
- Ensure every static machine has been installed properly and is stable (usually fixed down) and is not in a location where other workers, customers or visitors may be exposed to risk.
- Choose the right machine for the job.

Note that new machines should be CE marked and be supplied with a Declaration of Conformity and instructions in English.

Make sure the machine is:

- safe for any work that has to be done when setting up, during normal use, when clearing blockages, when carrying out repairs for breakdowns, and during planned maintenance;
- properly switched off, isolated or locked-off before taking any action to remove blockages, clean or adjust the machine.

Also, make sure you identify and deal with the risks from:

- electrical, hydraulic or pneumatic power supplies;
- badly designed safeguards. These may be inconvenient to use or easily overridden, which could encourage your workers to risk injury and break the law. If they are, find out why they are doing it and take appropriate action to deal with the reasons/causes.

Preventing access to dangerous parts

Think about how you can make a machine safe. The measures you use to prevent access to dangerous parts should be in the following order. In some cases it may be necessary to use a combination of these measures:

- Use fixed guards (eg secured with screws or nuts and bolts) to enclose the dangerous parts, whenever practicable. Use the best material for these guards – plastic may be easy to see through but may easily be damaged. Where you use wire mesh or similar materials, make sure the holes are not large enough to allow access to moving parts.
- If fixed guards are not practicable, use other methods, eg interlock the guard so that the machine cannot start before the guard is closed and cannot be opened while the machine is still moving. In some cases, trip systems such as photoelectric devices, pressure-sensitive mats or automatic guards may be used if other guards are not practicable.
- Where guards cannot give full protection, use jigs, holders, push sticks etc if it is practicable to do so.
- Control any remaining risk by providing the operator with the necessary information, instruction, training, supervision and appropriate safety equipment.

Other things you should consider

- Adequate training should ensure that those who use the machine are competent to use it safely. This includes ensuring they have the correct skills,

knowledge, experience and risk awareness, and are physically suited to the task. Sometimes formal qualifications are needed, eg for chainsaw operators.

- Ensure control switches are clearly marked to show what they do.
- Have emergency stop controls where necessary, eg mushroom-head push buttons within easy reach.
- Make sure operating controls are designed and placed to avoid accidental operation and injury, use two-hand controls where necessary and shroud start buttons and pedals.
- Do not let unauthorised, unqualified or untrained people use machinery – never allow children to operate or help at machines. Some workers, eg new starters, young people or those with disabilities, may be particularly at risk and need instruction, training and supervision.
- If machines are controlled by programmable electronic systems, changes to any programmes should be carried out by a competent person (someone who has the necessary skills, knowledge and experience to carry out the work safely). Keep a record of such changes and check they have been made properly.
- Ensure the work area around the machine is kept clean and tidy, free from obstructions or slips and trips hazards, and well lit.

Mobile work equipment

In addition to these general requirements which apply to all work equipment, Part III of PUWER contains specific duties regarding mobile work equipment, for example fork-lift trucks and dumper trucks.

You should **ensure** that where mobile work equipment is used for carrying people, it is suitable for this purpose. Measures should be taken to reduce the risks (eg from it rolling over) to the safety of the people being carried, the operator and anyone else.

Power presses

Part IV of the Regulations also contains specific requirements regarding power presses. In particular, you should have a power press, and associated guard or protection device, thoroughly examined at specified intervals and inspected daily when it is in use to **ensure** that it is safe. This work should only be performed by a competent person and records should be kept.

Dos and don'ts of machinery safety

As the dutyholder you should ensure that all employees likely to use machinery understand and follow these dos and don'ts:

Do...

- ✓ check the machine is well maintained and fit to be used, ie appropriate for the job, working properly and all the safety measures are in place – guards, isolators, locking mechanisms, emergency off switches etc;
- ✓ use the machine properly and in accordance with the manufacturer's instructions;
- ✓ make sure employees are wearing the appropriate protective clothing and equipment, required for that machine, such as safety glasses, hearing protection and safety shoes;
- ✓ ensure that those who use machinery are competent to use it safely, provide training where necessary. For some machinery a formal qualification is needed.

Don't...

- ✗ use a machine or appliance that has a danger sign or tag attached to it. Danger signs should only be removed by an authorised person who is satisfied that the machine or process is now safe;

- X** remove any safeguards, even if their presence seems to make the job more difficult;
- X** wear dangling chains, loose clothing, rings or have loose long hair that could get caught up in moving parts;
- X** distract people who are using machines.

Plant and equipment maintenance

Why is maintenance of plant and equipment important?

Additional hazards can occur when plant and equipment becomes unreliable and develops faults. Maintenance allows these faults to be diagnosed early, to manage any risks. However, maintenance needs to be correctly planned and carried out. Unsafe maintenance has caused many fatalities and serious injuries either during the maintenance or to those using badly maintained or wrongly maintained/repared equipment.

An effective maintenance programme will make plant and equipment more reliable. Fewer breakdowns will mean less dangerous contact with machinery is required, as well as having the cost benefits of better productivity and efficiency.

The Provision and Use of Work Equipment Regulations 1998 require work equipment and plant to be maintained so that it remains safe **and** that the maintenance operation is carried out safely.

What do I have to do?

If you are an employer and you provide equipment for use (such as hammers, knives and ladders or electrical power tools and larger plant), you need to demonstrate that you have arrangements in place to make sure it is maintained in a safe condition.

Think about what hazards can occur:

- if tools break during use;
- if machinery starts up unexpectedly;
- if there is contact with materials that are normally enclosed within the machine, ie caused by leaks/breakage/ejection etc.

Failing to correctly plan and communicate clear instructions and information before starting maintenance can lead to confusion and can cause accidents. This can be a particular problem if maintenance is carried out during normal production work or where there are contractors who are unfamiliar with the site.

Extra care is also required if maintenance involves:

- working at height or doing work that requires access to unusual parts of the building;
- entering vessels or confined spaces where there may be toxic materials or a lack breathable of air.

How can I do it?

Establishing a planned maintenance programme may be a useful step towards reducing risk, as well as having a reporting procedure for workers who may notice problems while working on machinery.

Some items of plant and equipment may have safety-critical features where deterioration would cause a risk. You must have arrangements in place to make sure the necessary inspections take place.

But there are other steps to consider:

Before you start maintenance

- Decide if the work should be done by specialist contractors. Never take on work for which you are not competent or not prepared.
- Plan the work carefully before you start, ideally using the manufacturer's maintenance instructions, and produce a safe system of work. This will reduce the risks and avoid unforeseen delays.
- Make sure maintenance staff are competent and have appropriate clothing and equipment.
- Try and use downtime for maintenance. You can avoid the difficulties in co-ordinating maintenance and lost production if maintenance work is performed before start-up or during shutdown periods.

Safe working areas

- You must provide safe access and a safe place of work.
- Don't just focus on the safety of maintenance workers – take the necessary precautions to ensure the safety of others who may be affected by their work, eg other employees or contractors working nearby.
- Set up signs and barriers and position people at key points if they are needed to keep other people out.

Safe plant and equipment

- Plant and equipment must be made safe before maintenance starts.

Safe isolation

- Ensure moving plant has stopped and that it is isolated from electrical and other power supplies. Most maintenance should be carried out with the power off. If the work is near uninsulated, overhead electrical conductors, eg close to overhead travelling cranes, cut the power off to these first.
- Lock off machines if there is a chance the power could be accidentally switched back on.
- Isolate plant and pipelines containing pressured fluid, gas, steam or hazardous material. Lock off isolating valves.

Other factors you need to consider

- Release any stored energy, such as compressed air or hydraulic pressure that could cause the machine to move or cycle.
- Support parts of plant that could fall, eg support the blades of down-stroking bale cutters and guillotines with blocks.
- Allow components that operate at high temperatures time to cool.
- Place mobile plant in neutral gear, apply the brake and chock the wheels.
- Safely clean out vessels containing flammable solids, liquids, gases or dusts, and check them before hot work is carried out, to prevent explosions. You may need specialist help and advice to do this safely.
- Avoid entering tanks, vessels or confined spaces where possible. These spaces can have additional hazards due to the atmosphere or risks of fire etc. If required, get specialist help to ensure adequate precautions are taken.
- Clean and check vessels containing toxic materials before work starts. If required, get specialist help to ensure adequate precautions are taken.
- Ensure that those who are doing the maintenance are competent to carry out the work. You may need to provide training to ensure that competence.

Do...

- ✓ ensure maintenance is carried out by a competent person (someone who has the necessary skills, knowledge and experience to carry out the work safely);
- ✓ maintain plant and equipment regularly – use the manufacturer’s maintenance instructions as a guide, particularly if there are safety-critical features;
- ✓ have a procedure that allows workers to report damaged or faulty equipment;
- ✓ provide the proper tools for the maintenance person;
- ✓ schedule maintenance to minimise the risk to other workers and the maintenance person wherever possible;
- ✓ make sure maintenance is done safely, that machines and moving parts are isolated or locked and that flammable/explosive/toxic materials are dealt with properly.

Don't...

- ✗ ignore maintenance;
- ✗ ignore reports of damaged or unsafe equipment;
- ✗ use faulty or damaged equipment.

How do the Regulations relate to other health and safety legislation?

The requirements of the Regulations need to be considered alongside other health and safety law, eg section 2 of the HSW Act requires all employers to ensure, so far as is reasonably practicable, the health, safety and welfare of all their employees and the Management of Health and Safety at Work Regulations 1999 contain duties for carrying out of a risk assessment and identify measures to eliminate, or reduce, the risks presented by the particular hazards in your workplace. Guidance on how to do this can be found on HSE’s risk management web pages www.hse.gov.uk/risk/.

Other more specific legislation may also apply, for example:

- the Workplace (Health, Safety and Welfare) Regulations 1992, which cover, for example, workplace risks to pedestrians from vehicles;
- the Construction (Design and Management) Regulations 2007 which contain, for example, specific requirements relating to certain types of work equipment such as scaffolding;
- the Supply of Machinery (Safety) Regulations 2008, as amended, which require that machinery:
 - is safe when supplied ('safe' refers to risks to both safety and health);
 - comes with a Declaration of Conformity and user instructions in English; and
 - is CE marked.

These requirements also apply to interchangeable equipment, safety components placed independently on the market, lifting accessories, chains, ropes and webbing, removable transmission devices and partly completed machinery.

Generally, if you are meeting the requirements of more specific legislation such as those outlined above, it should normally be sufficient to meet the more general requirements of PUWER.

Find out more

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Third edition)
HSE Books 2008 ISBN 978 0 7176 6295 1 www.hse.gov.uk/pubns/books/l22.htm

Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and guidance L113 HSE Books 1998
ISBN 978 0 7176 1628 2 www.hse.gov.uk/pubns/books/l113.htm

Hiring and leasing out of plant: Application of PUWER 98, regulations 26 and 27
MISC156 HSE Books 1998 www.hse.gov.uk/pubns/9204.pdf

Safe use of power presses. Provision and Use of Work Equipment Regulations 1998 as applied to power presses. Approved Code of Practice and guidance L112
HSE Books 1998 ISBN 978 0 7176 1627 5 www.hse.gov.uk/pubns/books/l112.htm

Workplace health, safety and welfare: A short guide for managers Leaflet
INDG244(rev2) HSE Books 2007 www.hse.gov.uk/pubns/indg244.htm

Managing health and safety in construction. Construction (Design and Management) Regulations 2007. Approved Code of Practice L144
HSE Books 2007 ISBN 978 0 7176 6223 4 www.hse.gov.uk/pubns/books/l144.htm

Buying new machinery: A short guide to the law and your responsibilities when buying new machinery for use at work Leaflet INDG271(rev1) HSE Books 2011
www.hse.gov.uk/pubns/indg271.htm

Safe use of woodworking machinery. Provision and Use of Work Equipment Regulations 1998 as applied to woodworking machinery. Approved Code of Practice and guidance L114 HSE Books 1998 ISBN 978 0 7176 1630 5
www.hse.gov.uk/pubns/books/l114.htm

Lifting equipment at work: A brief guide to the law Leaflet INDG290(rev1)
HSE Books 2013 www.hse.gov.uk/pubns/indg290.htm

Thorough examination of lifting equipment: A simple guide for employers Leaflet
INDG422 HSE Books 2008 www.hse.gov.uk/pubns/indg422.htm

Workplace transport safety: A brief guide Leaflet INDG199(rev2) HSE Books 2013
www.hse.gov.uk/pubns/indg199.htm

Workplace transport safety: An employers' guide HSG136 (Second edition)
HSE Books 2005 ISBN 978 0 7176 6154 1
www.hse.gov.uk/pubns/books/hsg136.htm

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

This leaflet is available at www.hse.gov.uk/pubns/indg291.htm.

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Compliance with PUWER for tree work winching operations.

Introduction

1. This paper outlines The Health and Safety Executive's (HSE) opinion on the application of the Provision and Use of Work and Equipment Regulations 1998 (PUWER) to winching operations used in tree work. It clearly states HSE's policy to apply the requirements of PUWER rather than those of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) to winching operations.¹

Issue

2. Differing opinions currently exist within the industry about the application of PUWER and LOLER to winching operations in tree work, eg skidding and directional felling. As a result, queries are regularly raised particularly in respect to the inspection and thorough examination of winching equipment. These queries often stem from how the term 'lifting' is interpreted in respect to loads being winched. The aim of this paper is to clarify the application of health and safety legislation to the use of winches in tree work - in particular in relation to the requirement for thorough examination and inspection.

PUWER/LOLER and winching operations.

3. In the first instance it is important to recognise that LOLER and PUWER require much the same thing for work equipment that they apply to: that the equipment is suitable for the task being undertaken; that it is properly maintained, and that it is operated correctly by competent people. PUWER is not a lesser standard. It requires a similar level of safety as LOLER if the risks demand it.
4. The application LOLER to winching operations is determined by the interpretation of the terms *lifting equipment* and *lifting operations*. In the *Safe use of lifting equipment - Lifting Operations and Lifting Equipment Regulations 1998 - Approved Code of Practice and Guidance (L113, second edition)*, Regulation 2(1) – Interpretation, defines *lifting equipment* as:

“Lifting equipment” means work equipment for lifting and lowering loads and includes its attachments used for anchoring, fixing or supporting it,

and lifting operation as:

“Lifting operation” means an operation concerned with lifting and lowering a load.

¹ Cable cranes lift as part of their function therefore the requirements of LOLER apply.

5. **L113** provides guidance on these definitions and gives examples of equipment and operations that are not covered by LOLER. In the guidance to *Regulation 2 (Interpretation, para 31)* it states that “*in most cases LOLER will not apply to work equipment which does not have as its principal function a use for lifting or lowering.*” **L113** then goes on to provide guidance on specific equipment and operations not covered by LOLER including (*para 32(b)*) “*winching a load where the load does not leave the ground.*”
6. In addition, *Figure 1 (p12)* of the **L113** is a decision tree which sets out the main elements that must apply to a piece of equipment for it to be subject to LOLER. It indicates that two of these elements are that the equipment’s main purpose is to ‘*lift or lower a load*’ and that the load is ‘*lifted free from supporting structures*’, e.g. the ground. It also further clarifies the definition of lifting as ‘*an operation that usually involves lifting or lowering a load from one surface to another.*’ This interpretation makes clear the intention of LOLER and if applied to winching equipment used in most forestry winching operations it means that the equipment is not subject to LOLER. However, it also makes it clear that where LOLER does not apply then “*a similar level of safety is required by PUWER in respect of the work equipment being used.*” (*Para 33*)
7. Whilst the **L113** interpretation excludes forestry winching operations from LOLER, other interpretations for lifting have been used within the industry and by trainers which imply that LOLER does apply. One such interpretation is contained in *The International Rigging and Lifting Handbook (North Sea Lifting Ltd)*, which includes the following definitions to differentiate between lifting and pulling:
 - a. *A lifting application is one in which a load does not become stationary should either the machine or any of its associated equipment fail;*
 - b. *A pulling application is one in which a load becomes stationary should either the machine or any of its associated equipment fail.*
8. Applying this definition of lifting to LOLER would mean that there would be numerous circumstances where winching equipment and operations would be subject to the requirements of the regulations - for example, winching timber up a slope steep enough to cause the timber to move back down the slope in the event of the winching equipment failing. However, whilst this interpretation is useful for assessing the level of risk involved in a winching operation, the *International Rigging and Lifting Handbook* is not a guide to the application of LOLER. Guidance to the application of LOLER is provided by the LOLER ACOP, **L113** which, as explained above, is clear about the application of the regulations to winching operations.
9. Again, it needs to be stressed that whether complying with LOLER or PUWER the outcome should be the same. The higher the risk associated with an operation, the more stringent the controls to make it safe and to comply with the regulations.

Inspection and thorough examination.

10. Both PUWER and LOLER are risk based. Therefore, regardless of the regulation, emphasis should be placed on the completion of suitable and sufficient risk assessments. The risk assessment is necessary to determine the nature and frequency of both the maintenance and inspection of equipment used in winching operations. Risk assessments, carried out to meet the requirements of the Management of Health and Safety at Work Regulations 1999, Regulation 3, should identify any significant risks from the use of the work equipment considering the:
- a. type of load being winched, its weight, shape and what it consists of;
 - b. risk of a load falling, moving, breaking up or striking a person or object and the consequences;
 - c. risk of the winching equipment striking a person or an object and the consequences;
 - d. risk of the lifting equipment failing while in use and the consequences; and
 - e. risk of damage to the winching equipment that could result in failure.
11. As previously discussed, LOLER will not apply to tree work winching operations and the scope of PUWER Regulation 6 requirements (inspection and the competence of the person who carries it out) need to be established by risk assessment. In effect, *Inspection* (PUWER Reg.6); and *Thorough examination and inspection* (LOLER Reg.9) should be seen as a related package of requirements with the outcome of the assessment, whether for PUWER or LOLER, being the same where the risk demands it.

Summary.

12. The definition of 'lifting equipment' and 'lifting operations' is provided in the Approved Code of Practice and Guidance to the LOLER regulations (L113 – Second edition). Under this interpretation, LOLER does not apply to winching operations that are regularly undertaken in tree work. However, PUWER is not a lesser standard of control but demands the same level of safety as LOLER if risks demand it.
13. Whilst under PUWER there is no specific requirement for 'thorough examination' of work equipment such as winches, PUWER requires risk-based inspection so the results of such an inspection, should be the similar to a 'thorough examination' under LOLER, where the risk requires it. Additionally, recording the outcomes of inspections under PUWER is as important as doing so for those under LOLER.
14. HSE's policy is to enforce the requirements of PUWER rather than LOLER on tree work winching operations.

First aid at work

Your questions answered



This is a web-friendly version of leaflet INDG214(rev2), published 05/14

This leaflet answers some basic questions about first-aid provision at work.

It is aimed at employers in small and medium-sized workplaces, but may be useful to all employers, managers and others involved in first aid at work.

Q1: What is first aid at work?

People at work can suffer injuries or be taken ill. It doesn't matter whether the injury or illness is caused by the work they do or not, it is important to give them immediate attention and call an ambulance in serious cases. You should make arrangements to ensure this happens. It can save lives and prevent minor injuries becoming major ones.

Q2: What do I need to do?

The Health and Safety (First-Aid) Regulations 1981 require you to provide adequate and appropriate first-aid equipment, facilities and people so your employees can be given immediate help if they are injured or taken ill at work.

What is 'adequate and appropriate' will depend on the circumstances in your workplace and you should assess what your first-aid needs are (see Q3).

The minimum first-aid provision on any work site is:

- a suitably stocked first-aid kit (see Q4);
- an appointed person to take charge of first-aid arrangements (see Q5);
- information for employees about first-aid arrangements (see Q9).

It is important to remember that accidents and illness can happen at any time. Provision for first aid needs to be available at all times people are at work.

Q3: What should I consider when assessing first-aid needs?

Some small workplaces with low-level hazards may need only the minimum provision for first aid. But there are circumstances and factors that will mean you need greater provision. You, as an employer, are well placed to decide the provision you need.

The checklist in Table 1 covers the points you should consider. Case studies are also available on the HSE website (www.hse.gov.uk/firstaid/resources.htm).

Q4: What should I put in the first-aid box?

There is no mandatory list of items to put in a first-aid box. It depends on what you assess your needs to be. As a guide, where work activities involve low-level hazards, a minimum stock of first-aid items would be:

- a leaflet giving general guidance on first aid (eg HSE's leaflet *Basic advice on first aid at work* – see Q10);
- individually wrapped sterile plasters (of assorted sizes), appropriate to the type of work (you can provide hypoallergenic plasters if necessary);
- sterile eye pads;
- individually wrapped triangular bandages, preferably sterile;
- safety pins;
- large, individually wrapped, sterile, unmedicated wound dressings;
- medium-sized, individually wrapped, sterile, unmedicated wound dressings;
- disposable gloves (you can find more advice at www.hse.gov.uk/skin/employ/gloves.htm).

This is a suggested contents list only.

The contents of any first-aid kit should reflect the outcome of your first-aid needs assessment.

It is recommended that you don't keep tablets and medicines in the first-aid box.

Q5: What is an appointed person?

Where your assessment of first-aid needs identifies that a trained first-aider is not required in your workplace, you should appoint someone to take charge of first-aid arrangements. This is the minimum requirement.

Even in a small, low-hazard business where first-aiders are not considered necessary, there is always the possibility that an accident or sudden illness may occur. It is therefore important that there is always someone available to take charge of these arrangements.

The role of this appointed person includes looking after first-aid equipment and facilities and calling the emergency services when required. They can also provide emergency cover where a first-aider is absent due to unforeseen circumstances (annual leave does not count). An appointed person does not need first-aid training.

An appointed person is not necessary where there are an adequate number of appropriately trained first-aiders.

Q6: What is a first-aider?

A first-aider is someone who has done training appropriate to the level identified in the needs assessment. This may be:

- first aid at work (FAW); or
- emergency first aid at work (EFAW); or
- some other first-aid training appropriate to the particular circumstances of your workplace.

The findings of your first-aid needs assessment (see Q3) will identify whether first-aiders should be trained in FAW, EFAW, or some other appropriate level of training. EFAW training enables a first-aider to give emergency first aid to someone who is injured or becomes ill while at work. FAW training includes the same content as EFAW and also equips the first-aider to apply first aid to a range of specific injuries and illness.

As a guide, Table 2 suggests the first-aid personnel to provide under different circumstances.

Other appropriate levels of training may have specialist or additional content appropriate to your particular circumstances.

To help keep their basic skills up to date, it is strongly recommended that your first-aiders undertake annual refresher training.

Q7: How do I identify and select a competent training provider?

First-aid training is available from a wide range of training providers. These include:

- those offering nationally recognised, regulated qualifications in FAW and EFAW;
- the voluntary aid societies (St John Ambulance, British Red Cross and St Andrew's First Aid);
- those operating under voluntary accreditation schemes;
- those who operate independently.

As an employer, you will need assurance that you have selected an appropriate training provider. You will therefore need to check that they meet the standards in a number of areas (due diligence). All training providers should be prepared to demonstrate that they:

- are competent to deliver first-aid training;
- have qualified trainers;
- teach relevant course content in the correct way;
- have the necessary quality assurance systems in place.

Where you select a training provider offering regulated qualifications you will not need to do any due diligence to satisfy yourself of their competence.

They operate under awarding organisations who are recognised by qualification regulators (Ofqual, the Scottish Qualifications Authority (SQA) and the Welsh Government) and have dedicated policies and quality assurance processes. The voluntary aid societies employ a similar hierarchy of policies and processes.

Contact details of awarding organisations offering regulated qualifications in FAW and EFAW can be found on HSE's website (www.hse.gov.uk/firstaid/efaw.htm).

You can find more advice in HSE's information sheet *GEIS3 Selecting a first-aid training provider: A guide for employers* (www.hse.gov.uk/pubns/geis3.htm).

Q8: How many appointed persons or first-aiders do I need?

There are no hard and fast rules on exact numbers. It will depend on the circumstances of your workplace. After working through the checklist in Table 1, refer to Table 2 which provides a general guide on how many appointed persons or first-aiders you might need. **The numbers given in Table 2 are suggestions only.** You should assess your first-aid needs in the light of your particular circumstances.

Where there are special circumstances, such as shift work or sites with several buildings, there may need to be more first-aid personnel than set out in Table 2. You will also need to increase your provision to cover for absences.

Q9: What information do I need to provide for employees?

You have to inform your employees of the arrangements you have put in place for first aid. Putting up notices telling staff who and where the first-aiders or appointed persons are, and where the first-aid box is, will usually be enough.

You will need to make special arrangements to give first-aid information to employees with reading or language difficulties.

Q10: Where can I find out more?

Information on first aid at work is available on the first-aid web pages of HSE's website: www.hse.gov.uk/firstaid

More detailed practical guidance on complying with your first-aid duties:
First aid at work: The Health and Safety (First-Aid) Regulations 1981.
Guidance on Regulations L74 (Third edition) HSE Books 2013
ISBN 978 0 7176 6560 0 www.hse.gov.uk/pubns/books/l74.htm

You may also find the following publications helpful:

Basic advice on first aid at work Leaflet INDG347(rev2) HSE Books 2011
www.hse.gov.uk/pubns/indg347.htm

Two first aid posters:

Basic advice on first aid at work HSE Books 2011 ISBN 978 0 7176 6432 0
www.hse.gov.uk/pubns/books/first-aid-poster.htm

Electric shock: First aid procedures HSE Books 2011 ISBN 978 0 7176 6433 7
www.hse.gov.uk/pubns/books/electric-shock-poster.htm

Table 1 Checklist for assessment of first-aid needs

Point to consider	Impact on first-aid provision
<p>Hazards (use the findings of your general risk assessment and take account of any parts of your workplace with different work activities/hazards that may require different levels of first-aid provision)</p>	
<p>Does your workplace have low-level hazards, eg the ones you might find in offices and shops?</p>	<p>The minimum provision is:</p> <ul style="list-style-type: none"> ● an appointed person to take charge of first-aid arrangements; ● a suitably stocked first-aid kit.
<p>Does your workplace have higher-level hazards, such as chemicals or dangerous machinery? Do your work activities involve special hazards, such as hydrofluoric acid or confined spaces?</p>	<p>You should consider:</p> <ul style="list-style-type: none"> ● providing first-aiders; ● additional training for first-aiders to deal with injuries caused by special hazards; ● additional first-aid equipment; ● precise location of first-aid equipment; ● providing a first-aid room; ● informing the emergency services in advance.
<p>Employees</p>	
<p>How many people are employed on site?</p>	<p>The minimum provision is:</p> <ul style="list-style-type: none"> ● an appointed person to take charge of first-aid arrangements; ● a suitably stocked first-aid box. <p>Depending on your circumstances, you should consider providing:</p> <ul style="list-style-type: none"> ● first-aiders; ● additional first-aid equipment; ● a first-aid room.
<p>Are there inexperienced workers on site (including those on 'work experience'), or employees with disabilities or particular health problems?</p>	<p>You should consider:</p> <ul style="list-style-type: none"> ● additional training for first-aiders; ● additional first-aid equipment; ● location of first-aid equipment.
<p>Accidents and ill-health records</p>	
<p>What injuries and illness have occurred in your workplace and where did they happen?</p>	<p>Make sure your first-aid provision caters for the type of injuries and illness that might occur in your workplace. Monitor accidents and ill health, and review your first-aid provision as appropriate.</p>

Point to consider	Impact on first-aid provision
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Working arrangements

Do you have employees who travel a lot, work remotely or work alone?	<p>You should consider:</p> <ul style="list-style-type: none"> ● issuing personal first-aid kits; ● issuing personal communicators/ mobile phones to employees.
Do any of your employees work shifts or work out of hours?	You should ensure there is adequate first-aid provision at all times people are at work.
Are the premises spread out, eg are there several buildings on the site or multi-floor buildings?	You should consider provision in each building or on each floor.
Is your workplace remote from emergency medical services?	<p>You should:</p> <ul style="list-style-type: none"> ● inform the emergency services of your location; ● consider special arrangements with the emergency services; ● consider emergency transport requirements.
Do any of your employees work at sites occupied by other employers?	You should make arrangements with other site occupiers to ensure adequate provision of first aid. A written agreement between employers is strongly recommended.
Do you have enough provision to cover for your first-aiders or appointed persons when they are absent?	<p>You should consider:</p> <ul style="list-style-type: none"> ● what cover is needed for annual leave and other planned absences; ● what cover is needed for unplanned and exceptional absences.

Non-employees

Do members of the public visit your premises?	Under the Regulations, you have no legal duty to provide first aid for non-employees, but HSE strongly recommends that you include them in your first-aid provision.
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Table 2 Suggested numbers of first-aid personnel to be available at all times people are at work

From your risk assessment, what degree of hazard is associated with your work activities?	How many employees do you have?	What first-aid personnel do you need?
Low-hazard , eg offices, shops, libraries	Fewer than 25	At least one appointed person
	25–50	At least one first-aider trained in EFAW
	More than 50	At least one first-aider trained in FAW for every 100 employed (or part thereof)
Higher-hazard , eg light engineering and assembly work, food processing, warehousing, extensive work with dangerous machinery or sharp instruments, construction, chemical manufacture	Fewer than 5	At least one appointed person
	5–50	At least one first-aider trained in EFAW or FAW depending on the type of injuries that might occur
	More than 50	At least one first-aider trained in FAW for every 50 employed (or part thereof)

NB This table refers to FAW and EFAW – but you may choose some other level of training appropriate for your circumstances.

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

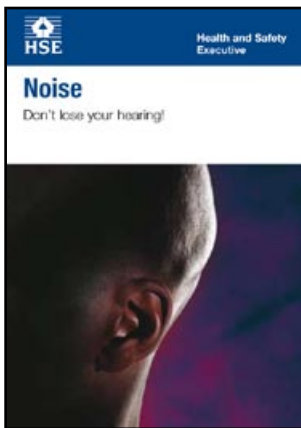
This leaflet is available at www.hse.gov.uk/pubns/indg214.htm.

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Noise

Don't lose your hearing!



This is a web-friendly version of pocket card INDG363(rev2), published 05/12

What is the problem with noise?

Noise is part of everyday life, but too much noise can cause **permanent** and **disabling** hearing damage. This can be hearing loss that gets worse over time, damage caused by sudden, extremely loud noises, or tinnitus (permanent ringing in the ears).

With hearing damage, conversation becomes difficult or impossible, your family complains about the television being too loud, you have trouble using the telephone, and you may be unable to sleep. By the time you notice, it is probably too late.

However, there is no need for your hearing to be damaged by your work – your employer has a duty to protect you and should be working on measures to reduce the risk. You can play a part in helping your employer to protect you.

Is there a noise problem where I work?

If any of the following apply, your employer would be expected to be doing something about noise:

- the noise is intrusive – like a busy street, a vacuum cleaner or a crowded restaurant – or worse, for most of the working day;
- you have to raise your voice to have a normal conversation when about 2 m apart, for at least part of the day;
- you use noisy powered tools or machinery for over half an hour a day;
- the type of work is known to have noisy tasks, eg construction, demolition or road repair; woodworking; plastics processing; engineering; textile manufacture; general fabrication; forging or stamping; paper or board making; canning or bottling; foundries; waste and recycling;
- there are noises because of impacts (such as hammering, drop forging, pneumatic impact tools etc), explosive sources such as cartridge-operated tools or detonators, or guns.

Another sign that something should be done about the noise is having muffled hearing at the end of the day, even if it is better by the next morning. If you have any ear or hearing trouble, let your employer know.

What does my employer have to do?

Your employer should be looking at:

- using quieter equipment or a different, quieter process;
- engineering/technical changes to reduce the noise at source;
- using screens, barriers, enclosures or absorbent materials;

- laying out of the workplace to create quiet workstations;
- improved ways of working to reduce noise levels;
- limiting the time you spend in noisy areas.

Your employer should be consulting you or your workplace representatives on these things.

What do I have to do?

Co-operate Help your employer to do what is needed to protect your hearing. Make sure you use properly any noise-control devices (eg noise enclosures), and follow any working methods that are put in place.

Wear any hearing protection you are given Wear it properly (you should be trained how to do this), and make sure you wear it all the time when you are doing noisy work, and when you are in hearing protection zones. Taking it off even for a short while really reduces the overall protection you get, meaning your hearing could still be damaged

Look after your hearing protection Your employer should tell you how to look after it and where you can get it from. Make sure you understand what you need to do.

Attend for your hearing checks It is in your interest that any signs of damage to your hearing are detected as soon as possible, and certainly before the damage becomes disabling.

Report any problems Report any problems with noise-control devices or your hearing protection straight away. Let your employer and any workplace representative know.

Note: all of the above are legal duties on you.

Personal hearing protection

Hearing protection such as earmuffs and earplugs is your last line of defence against damage. Your employer should provide it, and train you how to use it and how to get replacements. There are many different types and designs available, and your employer should consult you and offer a choice.

Earmuffs They should totally cover your ears, fit tightly and have no gaps around the seals. Don't let hair, jewellery, glasses, hats etc interfere with the seal. Keep the seals and the insides clean. Don't stretch the headband – the tension is crucial to protection. Helmet-mounted earmuffs can need particular care to get a good seal around your ears.

Earplugs They go right in the ear canal, not just across it. Practise fitting them and get help if you are having trouble. Clean your hands before you fit earplugs, and don't share them. Some types you use only once, others can be re-used and even washed – make sure you know which type you have.

Semi-inserts/canal caps These are held in or across the ear canal by a band, usually plastic. Check for a good seal, every time you put them on. Follow the same general advice as for earplugs and make sure any band keeps its tension.



This sign indicates an area where you must wear hearing protection.

Further information

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This pocket card contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

This leaflet is available in priced packs from HSE Books, ISBN 978 0 7176 6510 5. A web version can be found at www.hse.gov.uk/pubns/indg363.pdf.

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