



## Preventing falls from boom-type mobile elevating work platforms

### HSE Information Sheet MISC614

#### Introduction

This information sheet explains how to prevent falls, not just mitigate the effects once a fall occurs. It also explains how to select suitable fall protection equipment where the risk cannot be adequately controlled. All types of boom (articulated and telescopic) mobile elevating work platforms (MEWPs), commonly known as 'cherry pickers', are covered by this guidance, including ones that are:

- vehicle-mounted;
- self-propelled;
- trailer-mounted.

The guidance is not intended to cover risks associated with work near to (or on) overhead power lines, **people climbing out of the MEWP (this is not normally allowed)**, and the detailed requirements for information, instruction and training associated with the operation of MEWPs.

This information sheet has been produced in consultation with the International Powered Access Federation Ltd and the Construction Plant-hire Association.

#### Background

Between 1995/96 and 2001/02 **five fatal accidents** involving MEWPs were reported to HSE's Field Operations Directorate (FOD). The MEWPs involved had been struck by vehicles, suffered a failure or the ground had given way.

An analysis was made of FOD's reported and investigated incidents relating to:

- MEWPs collapsing;
- MEWPs overturning;
- people being thrown from the carrier;
- the carrier being trapped against fixed structures (the carrier is commonly referred to as the basket or cage).

The following primary causes were identified:

- equipment failure;
- ground conditions;
- outriggers (not used or faulty);
- trapping against fixed structure;
- MEWP being struck by vehicle;
- load/unload of MEWP under power;

- overloading a carrier;
- carrier struck by a load.

The risk of falling from a MEWP is from sudden movements caused by an impact, ground movement, failure of a stability critical part, or overreaching. The wearing of appropriate fall protection equipment can provide protection against the residual risk of falling, or being thrown out of the carrier.

In practice, work restraint will often be the most suitable form of personal fall protection (see the 'Types of fall protection equipment' section for a definition).



#### Assessing the risk

Employers and others responsible for the use of MEWPs must assess the risks of people falling from or being thrown from the carrier, or the MEWP overturning, and take precautions to eliminate or control those risks. The following points should be considered:

- What other vehicles, mobile plant or work equipment (eg overhead cranes) could be close by?
- Could parts protrude beyond the site boundary (eg buses have struck MEWPs)?
- What are/will be the general ground conditions (eg softness, slopes)?
- Are there any localised ground conditions that could be a hazard?
- Has the MEWP been examined, inspected, maintained and daily checks carried out?

- Could the carrier be caught on protruding features (eg steel work, tree branches)?

### Controlling the risk

Firstly assess whether risks can be **eliminated**, for example:

- remove uneven ground or excavations (eg adjusting the phasing of the work);
- remove soft ground by compacting.

If elimination is not reasonably practicable then assess the measures that should be put in place to minimise the risk of falling from or with the carrier.

Examples of **control measures** are divided into three categories: safe plant; safe site; and safe operator.

#### Safe plant

- Select the right MEWP for the job (consider ground conditions, working height, the task including the range/sensitivity of movement, the anticipated load, eg people and tools). **A MEWP must not be used as a crane.**
- Ensure the MEWP has a thorough examination by a competent person at least once every six months. Inspections may be more frequent depending on the use and operating conditions. Inspection intervals should be stated in the examination scheme. **Normally a MEWP has daily checks and a weekly inspection.**
- Ensure competent personnel undertake planned maintenance in accordance with the manufacturer's instructions. These are complex pieces of work equipment that need to be maintained. In particular, inadequate lubrication and electrical repairs have caused problems (eg a fault from an electrical repair has caused outriggers to raise while in use).
- After a hydraulic levelling system hose failure, establish whether the carrier tilt will lock when it is brought back to ground level. If it does, people are at risk of being tipped out.
- Check if a different make or model of MEWP is delivered to the site. Check that it is suitable for the task. This is important with poor ground-bearing capacities. Control systems can vary, leading to operator errors. MEWPs designed to be used on firm level slabs should not be used elsewhere.

#### Safe site

- Segregate other site traffic (delivery vehicles, dumpers, etc) from the work area.
- Ensure parts of a MEWP cannot protrude into roads or other transport routes. If this is not possible, you need to use systems of work (eg temporary road closure at quiet times).

- Check the work area for localised features, eg manholes, service ducts, potholes, etc (eg a hole 75 mm deep caused an overturn).
- Check temporary covers are strong enough to withstand the applied pressure.
- Check temporary covers are secured and monitor them. Take similar action for permanent covers.
- Establish the load bearing capacity (general and point loading, eg outriggers) when working inside in a building or on a structure (eg a jetty).
- Ensure there is supervision to ensure safe systems of work are appropriate and being used.
- Check for overhead crushing or contact hazards.
- Have agreed systems of communication (eg between MEWP operators and banksman during steel erection work).
- Check weather conditions have not altered ground conditions (eg heavy or prolonged rain).
- Establish limits for safe operation (eg maximum wind speed). Remember conditions can change internally (eg if roller doors are opened).
- Comply with permit-to-work systems where sites have them (eg chemical plants).
- Ensure you have a rescue plan agreed and in place for a fall. Are trained people and rescue equipment on-site? Do all operatives understand what to do?
- Assess other alternative work methods or equipment before operating near a steep slope or edge. If you must operate near an edge or steep slope, can barriers be provided that will retain the MEWP? If this is not possible, where should a barrier be positioned (you need to know the braking performance)? If this is not possible, how will the work be sequenced so that the MEWP can operate in a safe manner (eg in line with the edge rather than towards it)?

#### Safe operator

- Ensure you have procedures for loading/unloading during delivery/removal from site. Does this procedure apply to all your MEWPs (eg some do not have braking on all wheels)?
- Ensure operators are trained and familiar with the performance and controls of the MEWP they going to use (eg do they know the types of ground/slope it can operate on or when outriggers will require packing?).
- Ensure operators have any task-specific training (eg use of a chainsaw).
- Ensure daily checks are done (in accordance with the manufacturer's instructions).
- Ensure operators know when further operation would be unsafe. Do they know how to position the MEWP for optimum use?
- Ensure there is a system for recording faults, repairs and maintenance. What types of fault would prevent further use of machine (eg controls not responding correctly)?

## Use of fall protection

If there is still a residual risk of impact or persons falling after you have assessed the risks and put the control measures in place, then the use of fall protection equipment should be considered, for example:

- when working next to or in a live highway (eg street-lighting work or tree-crown lifting) where there is a risk of a vehicle hitting the MEWP;
- when travelling with the carrier in a raised position where it may strike fixed objects in its path (eg branches, steel work);
- when travelling with the carrier in a raised position over uneven ground;
- steel erection where the carrier has to move in and around the steelwork.

The MEWP must be suitable for travelling with the carrier in a raised position.

## Types of fall protection equipment

There are two types of fall protection that a person can use in the carrier:

- **work restraint system** (also known as fall restraint and incorrectly referred to as work positioning) - this stops a person falling from the carrier in the first place (unless it is a MEWP overturn).
- **fall arrest system** - this stops a person after they have fallen from the carrier (unless it is a MEWP overturn).

When deciding, as part of a risk assessment, which system should be used, the following points should be considered.

- Check with the manufacturer that the MEWP can be used as part of a fall arrest system. Does the carrier have suitable anchor points? The majority of anchor points are currently rated for work restraint and not fall arrest. The testing of anchor points is covered in BS EN 795: 1997.<sup>1</sup> Anchor points in the carrier should be marked for work restraint or fall arrest and the number of persons for which they are rated (arresting a fall could also generate enough force to cause an overturn - check the MEWP can absorb this shock load).
- After a fall the MEWP will flex, causing more severe swinging movements than normal (this could lead to a higher risk of striking the MEWP or other nearby structures).
- Could the dynamic impact of a fall arrest cause other occupants, loose materials or tools to be ejected from the carrier?
- The user needs to establish the height the carrier will be working at and select fall arrest equipment that will work within that height. A typical fall arrest

system with a full body harness, 2.0 m lanyard and shock-absorbing device requires over 5 m clearance height to deploy and arrest a fall. Contact the fall arrest equipment supplier to establish the minimum clearance height for the proposed equipment.

- Check that there are no projections (balconies, canopies) that a person could strike during a fall.
- After a person's fall has been arrested, how are you going to rescue them? There should be a rescue plan and people should be practised in this.

## Work restraint system

A work restraint system for use on a MEWP should normally be a combination of a full body harness (BS EN 361<sup>2</sup>) and a lanyard (BS EN 354<sup>3</sup>). It does not normally have shock-absorbing capability.

It is becoming a common practice to use retractable lanyards to provide the occupants with maximum freedom of movement, together with immediate restraint in the event of impact or levelling system failure. The use of retractable lanyards for this purpose should only be considered after detailed consultation with the manufacturer as to their suitability and the parameters under which they have been designed and, more importantly, tested. Do not use retractable equipment unless it has been specifically tested in the proposed manner of use.

Lanyard length (of both fixed length and retractable systems) should be carefully selected and matched to the carrier of the specific MEWP that is going to be used. **They must be set short enough to prevent a person reaching a position where they could fall.**

## Working near water

When working next to water, a harness should not be worn due to the risk of drowning if the MEWP falls into the water. Life jackets should be worn.

## Instruction in use of fall protection equipment

Operators will need instruction in the use of the harness, lanyard, rescue equipment and the procedures for periodic inspection, maintenance and storage of fall protection PPE (especially textile equipment). For further information refer to the HSE leaflet *Inspecting fall arrest equipment made from webbing or rope*.<sup>4</sup>

## The Law

If you own, hire or otherwise operate or control the operation of MEWPs (eg as principal contractor), you have duties under health and safety law. The specific legal provisions are (or will be) contained in the

following pieces of legislation:

- Provision and Use of Work Equipment Regulations 1998;
- Lifting Operations and Lifting Equipment Regulations 1998;
- Personal Protective Equipment at Work Regulations 1992;
- Construction (Design and Management Regulations) 1994;
- Construction (Health, Safety and Welfare) Regulations 1996;
- Workplace (Health, Safety and Welfare) Regulations 1992;
- The Work at Height Regulations, due in 2004.

## References

- 1 BS EN 795: 1997 *Personal protective equipment against falls from a height. Anchor Devices – Requirements and testing* British Standards Institution (under revision)
- 2 BS EN 361: 2002 *Personal protective equipment against falls from a height. Full body harnesses* British Standards Institution
- 3 BS EN 363: 2002 *Personal protective equipment against falls from a height. Fall arrest systems* British Standards Institution
- 4 *Inspecting fall arrest equipment made from webbing or rope* Leaflet INDG367 HSE Books 2002 (single copy free or priced packs of 10 ISBN 0 7176 2552 4)

## Further reading

BS EN 354: 2002 *Personal protective equipment against falls from a height. Lanyards* British Standards Institution

BS EN 355: 2002 *Personal protective equipment against falls from a height. Energy absorbers* British Standards Institution

BS EN 358: 2000 *Personal protective equipment against falls from a height. Belts for work positioning and restraint and work positioning lanyards* British Standards Institution

BS EN 360: 2002 *Personal protective equipment against falls from height. Retractable type fall arrestors* British Standards Institution

BS 8460: 2005 *Safe use of MEWPs: Code of Practice* British Standards Institution

BS 8454: 2006 *Code of Practice for the delivery of training and education for work at height* British Standards Institution

*Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22* (Second edition) HSE Books 1998 ISBN 0 7176 1626 6

*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

*Personal protective equipment at work. Personal Protective Equipment at Work Regulations 1992 (as amended). Guidance on Regulations L25* (Second edition) HSE Books 2005 ISBN 0 7176 6139 3

*Managing health and safety in construction: Construction (Design and Management) Regulations 1994. Approved Code of Practice and guidance HSG224* HSE Books 2001 ISBN 0 7176 2139 1

*A guide to the Construction (Health, Safety and Welfare) Regulations 1996* Leaflet INDG220 HSE Books 1996 (single copy free or priced packs of 10 ISBN 0 7176 1161 2) Web version: [www.hse.gov.uk/pubns/indg220.pdf](http://www.hse.gov.uk/pubns/indg220.pdf)

## Further information

British Standards are available from BSI Customer Services, 389 Chiswick High Road, London W4 4AL  
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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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