

The Work at Height Safety Association

Technical Guidance Note 5

“Guidance on rescue during work at height”

A series of informative notes for all industries involved with work at height or rescue.

The Work at Height Safety Association (WAHSA) is a UK trade association for manufacturers of equipment for work at height and rescue. This series of guidance notes is published by WAHSA to provide information on topical issues relating to work at height which may be a source of confusion, or where other information may be lacking. The information provided is only intended to apply within the UK.

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WAHSA technical guidance note no. 5

Guidance on rescue during work at height

Introduction

This leaflet is intended to provide guidance emergency planning and the provision of rescue resources for work at height, either for rescue of an incapacitated person by others, or self evacuation of an individual without additional assistance.

The emergency planning element is often not considered when work at height is being planned. Employers may wish to consider the following points:

- there is a lack of awareness of suspension trauma and its consequences
- employers often fail to appreciate where and when rescue provision is required
- employers often fail to provide adequate rescue equipment or appreciate what is suitable equipment for use in rescue
- because rescue operations are carried out under extreme pressure, consideration should be given to all aspects of the rescue process. Elements to consider would include the type of equipment required, the demands placed upon the rescuer, the training the rescuer will require to carry out the rescue and how the effectiveness of the rescue system as a whole can be maintained.

This guidance note offers general information about the issues which should be considered for emergency procedures for all work at height.

It does not give information or detailed guidance on specific procedures or indicate whether individual methods might be preferable. Each site and each situation will be different.

Background

There are three main reasons why employers need to make provision for rescue arrangements when working at height:

1. the Work at Height Regulations require this
2. the casualty needs to be attended to and recovered quickly
3. it is your (employer's) responsibility and not some other individual or organisation

The law

The Work at Height Regulations require employers to make specific provisions for emergency planning:

Organisation and planning – Regulation 4

(1) Every employer shall ensure that work at height is ... properly planned

(2) Planning of work includes planning for emergencies and rescue.

In addition, the following regulation requires that all activities, including rescue, must be carried out by competent persons:

Competence - Regulation 5

Every employer shall ensure that no person engages in any activity, including ... planning, and supervision, in relation to work at height...unless [they are] competent to do

The need for a rapid response

Help must be available promptly. The survival of an injured person often depends on the speed of recovery and the level of care subsequently provided. Being suspended for any length of time after a fall can be potentially fatal owing to the effects of suspension trauma (see below).

In cases where evacuation is required, it may be essential that the operation is completed rapidly for reasons of objective danger e.g. fire.

General considerations for rescue

It is essential that there is a specific rescue plan and adequate resources in place for each worksite where work at height is carried out. These should be regularly assessed, and updated where necessary. Resources should include not only equipment but also personnel who have been trained in the use of that equipment.

When planning for rescue, consideration should be given to the type of situation from which the casualty may need to be recovered and the type of fall protection equipment which the casualty would be using.

A distinction may be made between the terms "rescue" and "evacuation". Rescue typically involves the recovery of a casualty by another person either remotely or directly. Evacuation is typically carried out by a stranded user to escape from a remote situation such as a tower crane or narrow aisle truck.

Listed below are examples of different situations or fall protection systems from which a casualty may need to be recovered and for which suitable provision should be made. Some situations may create special difficulties, for example attaching to a remote casualty who is suspended out of reach

- steel wire fall arrest block
- textile fall arrest block
- vertical anchor line - textile
- vertical anchor line - wire
- vertical rail
- horizontal wire anchor line
- horizontal textile anchor line
- energy absorbing lanyard
- hooped ladder

All rescue planning and operations should address the following issues:

- the safety of the persons carrying out or assisting with the rescue
- the anchor points to be used for the rescue equipment.
- the suitability of equipment (anchors, harnesses, attachments and connectors) that has already arrested the fall of the casualty for use during the rescue.
- the method that will be used to attach the casualty to the rescue system.
- the direction that the casualty needs to be moved to get them to the point of safety. (raising, lowering or lateral)
- the first aid needs the casualty may have with respect to injury or suspension trauma
- the possible needs of the casualty following the rescue

The loads placed on some items of equipment during a rescue may be higher than they have been originally designed for. If equipment is used for rescue either individually or in systems, the supplier should verify that it has suitable performance and loading characteristics in that specific configuration. This applies to all parts of the system including the anchors.

The anticipated loads during the rescue situation should be within the loadings specified in the manufacturer's user instructions.

If a rescue procedure requires an operator to descend to recover a casualty there may be additional loading on all parts of the system including the anchor, which may be required to support the load of two persons.

Anchor points are an important part of any rescue system, they should be suitably positioned for the intended operation and should be unquestionably sound.

Some special types of anchor device (e.g. portable horizontal lines, portable deadweights) may not be suitable for such applications. In particular, deadweights are unlikely to be capable of supporting the weight of two persons. Users of such systems should consult the manufacturer for guidance.

When completing a rescue methods which minimise the risk to rescuers are preferred. Always avoid placing additional personnel at risk.

Types of rescue

There are four options for dealing with an emergency which requires an injured or incapacitated person to be recovered to safety, presented here in order of preference (bearing in mind the immediate aim is to recover the casualty to the nearest point of safety):

1. lowering a remote casualty
2. raising a remote casualty
3. self evacuation by descent
4. rescuing another in descent

The reasons for the ordering are as follows. In all cases it is preferable that the rescuer is not involved in descent or suspension. When rescuing a third party, 1 and 2 are preferable to 4.

Option 1 is (generally) preferable to option 2 because it is more straightforward and physically easier to lower a load than to raise one.

The potential for a casualty to be located over an edge should also be considered. All of the four types of rescue will be further complicated where edges and obstructions are involved. Recovery over an edge will:

- increase the effective load in raising operations due to additional friction
- create risks of cutting or abrasion of the anchor line
- interfere with the operation of rescue equipment.

The above should be considered when selecting equipment to ensure that it will still operate effectively in the conditions required.

General considerations for carrying out a rescue

The following steps will be found to apply in most situations, whether the casualty is to be lowered or raised:

Because the rescue system will be under tension it is prone to damage from abrasion and cutting. Risk assessment may indicate the need to use rescue equipment that is capable of coping with these conditions or an additional safety line may be required as a back up.

When operating rescue equipment it is essential that control is maintained at all times.. Always refer to the manufacturer's user instructions.

The anchor for the rescue equipment should be in a position where the equipment can be operated easily and safely. It may be preferable to site the equipment away from the edge to be able to operate it in safety. In this situation it may be necessary to use additional equipment to redirect or align the system correctly.

Edges can cause problems including abrasion of the system, increased friction and a potential for shock loading if the edge collapses. If possible, arrange the anchor point so that the equipment does not contact the edge. If this cannot be done (e.g. on top of a building) then the equipment must be protected from the edge and care must be taken to ensure that the edge is capable of sustaining the loads applied.

Always maintain a steady, controlled rate of movement at all times when raising or lowering a casualty and ensure that they do not come into contact with obstructions. Some items of rescue equipment (e.g. certain winches and descent devices) allow movement only in one direction, so it is important not to lift or lower the casualty into a position where they become stranded.

A guy line or tag line may be attached to the casualty to pull them away from any obstructions and direct them towards the desired location.

The person being rescued may be conscious or unconscious and the rescue plan must allow for this. It is important that during the rescue the casualty is not moved into a potentially dangerous situation. Ideally, the rescuer should be able to communicate with the casualty at all times or see the casualty at all times or communicate with someone who can see the casualty at all times.

General procedure for casualty recovery

1. Assess the situation fully before commencing a rescue operation
2. Request medical assistance
3. Identify proper position from which to carry out the operation.
4. Identify proper anchorage points
5. Identify a point of safety to move the casualty to
6. Make sure all involved are aware of the procedure to be carried out and their role within it
7. Ensure personnel have been trained in rescue procedures are competent to carry out their role.
8. Carry out the rescue steadily and in a controlled manner.
9. Make sure communication is maintained at all times
10. Monitor the casualty's condition at all times and where possible provide the necessary first aid
11. Conduct a review of the whole situation identifying areas of improvement for the future

Suspension trauma

All users of personal fall protection systems, and others involved with work at a height, should be aware of the following precautions that might need to be taken in the event of a casualty being in a suspended position.

1. The longer the casualty is suspended without moving, the greater the chances are of suspension trauma developing and the more serious it is likely to be. Therefore, an injured person hanging in a harness awaiting rescue should be removed from upright suspension as quickly as possible. The aim should be to do this within 10 minutes. This is particularly important for a casualty who is motionless.
2. A conscious casualty should be encouraged to exercise their legs gently, to stimulate circulation of the blood.

NOTE: manufacturers provide various type of suspension trauma relief equipment for use by a suspended person. These can delay the effects of suspension trauma, but they only work on conscious and able casualties, so they are not an alternative to rescue.

3. Regarding the position of the casualty:
 - during rescue, a position with the lower limbs slightly elevated may be preferable.
 - after rescue, position the casualty in an upright sitting position, with knees bent - DO NOT allow them to lie flat.
 - Only move the casualty to a fully horizontal position at the advice of qualified medical personnel.
 - if suspension trauma is a possibility, alert medical agencies immediately and advise them of the issues, the casualty might need dialysis to protect the kidneys

Following an accident, the casualty should be:

- removed from the suspended position and cared for in a proper manner;
- Given medical assistance as quickly as possible.

Users of personal fall protection equipment should be aware of the issues surrounding suspension trauma. In addition some staff will require training in rescue techniques or alternatively it may be necessary to create a specially trained rescue team on site to be available at short notice.

Rescue equipment

Specific rescue equipment should always be present at the worksite. This equipment should be sufficient to carry out a rescue of an individual from any situation on the site. Rescue systems may be designed specifically for rescue or for evacuation and may allow only lowering, only raising or both.

There is some confusion about the applicability of product standards for rescue equipment or equipment that is used for rescue. This confusion is compounded by a lack of available guidance for users on how to select and identify suitable rescue systems..

Purchasers should be aware of the difference between testing which has been carried out for the purposes of type approval and additional tests which can demonstrate the suitability of a product or system for other purposes. When selecting items of equipment for use in rescue situations you need to satisfy yourself that the item is suitable for your specific application or applications.

Rescue equipment may be tested in two different ways, as a whole or as individual components. In both cases the rescue equipment should conform to appropriate European or British standards. Examples of standards that relate to rescue equipment and some of the common applications are as follows.

- EN 341, prEN 12841– Descent devices. Used for self evacuation, rescue of another person by descent or for lowering a casualty. These devices may be used in conjunction with the following items to create systems which may also raise a casualty.
- EN 567, EN 795, EN 12278, EN 1891 – Rope clamps, anchor slings, pulleys and low stretch rope. Used in conjunction with descent devices for assembling pulley systems for raising and lowering. Commonly used for rescue in pre assembled kits and as components in rescue systems which are assembled at the scene by specially trained persons.
- EN 1496 – Rescue lifting devices – Pre assembled devices for raising and lowering – Commonly used for rescue in confined space situations.
- EN 360 / EN 1496 – Fall arrest and Recovery blocks. Suitable for arresting falls, but with a built in recovery feature. – Commonly used for rescue in confined space situations.

European and British standards set out performance specifications for products but they may not cover all aspects of the intended use of the equipment. If products are intended to be used in a way which is clearly outside the use specified in the standard, it may be appropriate to carry out additional testing to ensure that the equipment is fit for the intended purpose.

In the case of rescue equipment sold for specific applications this additional testing should have been carried out by the manufacturer or supplier. e.g. a pre assembled rescue kit.

Alternatively if a rescuer utilises a piece of equipment for other than its intended purpose or creates a system from components, then the rescuer must be sure that the equipment is fit for purpose. This may require the rescuer to conduct additional testing or carry out research prior to implementing the system. This will confirm that the equipment will perform safely and in the manner required.

Harnesses used for rescue can be split into two categories. Those designed for rescue specifically and those designed for fall protection that can be utilised during a rescue.

If a casualty is suspended by a fall protection harness then rescuing them utilising it is unlikely to increase the risk to them.

Harnesses designed specifically for rescue may offer benefits such as quick and easy fitting to a casualty (ideal where the casualty is unconscious, requires securing quickly or needs to be evacuated from a situation without delay) or the orientation that they suspend the casualty (this is essential when raising a casualty through a confined access point).

If a casualty is badly injured, the use of a stretcher may need to be considered.

Inspection of rescue or evacuation equipment

Rescue or evacuation equipment should be inspected as per other equipment for work at height (see WAHSA Technical Guidance note number 3) although the period specified between inspections might be longer than for normal work equipment if the rescue or evacuation equipment has not been used and has been stored correctly.

This equipment should in any case be inspected at least once a year and always after use for a rescue or evacuation, by a competent person. For additional guidance refer to the manufacturer or supplier.

Rescues are unplanned events that require an immediate and effective response. Correct maintenance of rescue equipment will ensure that it is ready for use and when deployed it will function correctly. Any part of a rescue system that does not function correctly when needed will unnecessarily increase the risk to the casualty and possibly the rescuer.

First aid

The First Aid at work Regulations require every employer to carry out a risk assessment of the requirements for first aid at every work site. When making this assessment, employers need to consider:

- the location of the workplace
- type of risks involved
- the remoteness of the site from emergency services
- the needs of remote works
- employees working on shared or multi-occupied sites

There should be a suitable first aid kit present at every worksite together with a person who has specific responsibilities for administering first aid.

The knowledge requirements for first aiders where training is being done for work at height are given in BS 8454. These are summarised as follows:

- the role of the first aider, use of available equipment and recording of incidents
- basic hygiene
- assessment of the situation to enable effective action
- casualty assessment and handling
- administration of first aid safely, promptly and effectively to casualties who may be:
 - unconscious and/or in seizure
 - wounded or bleeding and/or in shock
 - choking
 - sustained a fracture
 - sustained a spinal injury
 - suffering from suspension trauma
- administration of cardiopulmonary resuscitation promptly and effectively
- effective use of a neck collar

WAHSA recommend that first aiders for all work at height are able to satisfy these requirements.

Training

WAHSA strongly recommend that all users of fall protection equipment are trained by a competent organisation. Training should include information on the selection of the correct products for intended work situation and pre-use checks for specific equipment.

Carrying out rescues and the use of rescue equipment requires technical capability in addition to the ability to use personal fall protection. The requirement for training and the opportunity to maintain competence by either repeat training or rescue practices is essential and should not be underestimated.

Useful References

WAHSA Technical Guidance Notes (available from www.wahsa.org.uk)

TGN 01	10 points for the use of fall protection equipment
TGN 02	Guidance on the selection, use, maintenance and inspection of retractable type fall arresters.
TGN 03	Guidance on inspecting personal fall protection equipment
TGN 04	Guidance on the use of single and twin energy absorbing lanyards.
TGN 05	Guidance on rescue after a fall from height
TGN 06	Guidance on inspecting eyebolts used for personal fall protection purposes
TGN 07	Sources of information relating to work at height

Regulations

The Work at Height Regulations 2005

The Lifting Equipment and Lifting Operations Regulations 1997

Product standards

BS EN 354, *Personal protective equipment against falls from a height — Lanyards.*

BS EN 355, *Personal protective equipment against falls from a height — Energy absorbers.*

BS EN 358, *Personal protective equipment for work positioning and prevention of falls from a height — Belts for work positioning and restraint and work positioning lanyards.*

BS EN 361, *Personal protective equipment against falls from a height — Full body harnesses.*

BS EN 362, *Personal protective equipment against falls from a height — Connectors.*

BS EN 363, *Personal protective equipment against falls from a height — Fall arrest systems.*

BS EN 364, *Personal protective equipment against falls from a height — Test methods.*

BS EN 365, *Personal protective equipment against falls from a height — General requirements for instructions for use, maintenance, periodic examination, repair marking and packaging.*

Codes of practice

BS 7883:2005, *Code of practice for the design, selection, installation, use and maintenance of anchor devices conforming to BS EN 795.*

BS 8437:2005, *Code of Practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace.*

BS 8454:2006, *Code of Practice for delivery of training and education for work at height and rescue*