Northern Ireland
Fire & Rescue Service

Protecting Our Community

SERVICE TRAINING NOTE

OPERATIONAL 11

Working at Height

Date: 1 April 2014

Version: 1.0

Prepared by: Learning & Development Centre

VERSION CONTROL

VERSION No.	ACTION	PREPARED BY	APPROVED BY	DATE ISSUED
1.0	New Note	WC N McKerracher	GC J Langtry	24 Sep 2009
1.1	Note amended: • Pgs 6-7 – reference to 5M Adjustable lanyard replaced with Petzl Grillon 5M Adjustable Lanyard	SC N McKerracher	SC A Martin	1 Apr 2014

INDEX

NOTES

1. Aim

To provide all NIFRS personnel with the knowledge and understanding of WAH (NI) Regs 2005 & their application within NIFRS.

2. Learning Outcomes

At the end of this session all personnel will be able to:

1. Demonstrate an understanding of the WAH Hierarchy.

2. Demonstrate an understanding of a Work Restraint and Fall Arrest.

3. Demonstrate an understanding of the limitations associated with a Work Restraint and Fall Arrest

4. Demonstrate an understanding of WAH in relation to fragile surfaces.

5. Demonstrate an understanding of the cause and treatment of suspension trauma.

6. Demonstrate ability to:

   Correctly don and adjust the RGH12 harness

   Correctly assemble a fall prevention system

   Correctly assemble a fall arrest system

   Correctly assemble a temporary lifeline

   Correctly assemble the Petzl ID

   Correctly tie a Figure 8 knot

7. Demonstrate ability to systematically examine NIFRS work at height equipment

8. Demonstrate understanding of correct procedure in relation defective equipment

9. Demonstrate understanding of correct maintenance procedures

NOTES

3. Introduction

Work at height covers all work activities where there is a possibility that a fall, likely to result in personal injury could occur. Work at Height includes access to and exit from a place of work.

Following the publication of the Work at Height Regulations it was agreed with the HSE that service specific guidance would be the best way forward for the FRS. It was considered important for the FRS to develop its own guidance to suit its own activities, whether for training or operational requirements. To this end the NIFRS has developed its Work at Height Training Course in line with the current guidance and legislative requirements.

The intention of the Work at Height Regulations is not to hinder the speed or effectiveness of emergency services acting in the emergency phase of an incident but when this phase has passed, the Regulations will be expected to apply as normal. FRS's will be expected to have generic training and experience available to deal with risks associated with the emergency phase. They should also be able to use dynamic risk assessments to cope with changing circumstances.

> "We may risk our lives a lot, in a highly calculated manner, to protect saveable lives."
>
> "We may risk our lives a little, in a highly calculated manner, to protect saveable property."
>
> "We may not risk our lives at all for lives or property that are already lost."

The aim of this training course is to provide NIFRS personnel with safe systems of work in order that they can protect themselves and others from the risk of injury whilst working at height after the emergency phase of an incident or whilst working at non emergency incidents. This training note is supplementary to the WAH training course and Power Point presentation.

4. The Work at Height Regulations

NOTES

UNDERSTANDING THE WAH HIERARCHY

Avoid

Don't work at height if you can do it any other way.

Prevent (Fall Restraint)

If you have to work at height:

Work from an 'existing (safe) place of work'. (Figure 1)

Figure 1

If you can't work from an existing place of work:

Use work equipment to prevent the fall (Bronto, HP, VEMA, PPE).

The use of 'collective' fall prevention should always be selected ahead of personal fall prevention where possible.

MITIGATE (FALL ARREST)

If you can't prevent the fall:

Minimise height and consequences.

If you can't minimise both the height and consequences

Minimise the consequences.

OTHER MEASURES (TRAINING AND SUPERVISION)

If you can't minimise the consequences:

Minimise the risk of fall occurring through instruction, training and supervision.

NOTES

5. Work at Height Equipment

The work at height kit issued to all **No.1** appliances throughout the NIFRS consist of 2 bags, each containing the following equipment:

1 x RGH12 full body harness

1 x 5m adjustable lanyard

1 x fall arrest twin lanyard

1 x 25m belay rope

1 x Petzl ID

1 x Wire Sling

2 x Webbing Slings

4 x Screw gate karibeners

1 x Edge protection

RGH12 FULL BODY HARNESS

Front Attachment and Buckle

Rear Attachment

Only those personnel who have received training in the correct fitting, adjustment and use of the RGH12 harness should use this piece of PPE.

Fitting

NOTES

Don harness and connect chest buckle

Connect Waist Buckle

Connect Leg Buckles ensuring comfort padding is located on the inner thigh

Adjust torso and leg straps until harness fits neatly but comfortably. **Do not allow the harness to be excessively loose**.

Inspection

The harness should undergo a visual and tactile examination:

before use,

quarterly as part of a scheduled maintenance routine,

annually as part of a more detailed examination by a 'competent' person.

Defects

The following defects will result in the harness being removed from service:

Any cuts, holes or burns to the webbing straps.

Any defective buckles or attachment points.

Any significant damage to load bearing stitching (load bearing stitching can be identified by its contrasting colour in relation to the webbing).

Any significant contamination of webbing components with oil, grease, petrol, acids or similar contaminants.

If a harness reaches its obsolescence date (5 years from 1st use).

PETZL GRILLON 5M ADJUSTABLE LANYARD

NOTES

Only those personnel who have received training in the use of the Petzl Grillon 5m adjustable lanyard should use this piece of PPE.

The Petzl Grillon 5 m adjustable lanyard is intended to be used in conjunction with the RGH12 harness and an appropriate anchor to provide a ‘work restraint’ system (see Operational Use section) for personnel working at height.

The adjustable lanyard consists of:

Scaffold Hook

11mm Kernmantle Rope

Petzl Grillon

Inspection

The lanyard should undergo a visual and tactile inspection:

before use,

quarterly as part of a scheduled maintenance routine,

annually as part of a more detailed examination by a ‘competent’ person.

Defects

The following defects will result in the lanyard being taken out of service

Defective scaffold hook, which may include:

Ability of the gate to open without the rear latch being depressed (inadvertent opening)

Cracks or distortion to the metal work

Significant corrosion

Defective Rope:

Cuts to the outer sheath where the inner core is visible

Significant contamination with oil, grease, acid, rust or similar contaminants

Swelling of the rope indicating internal core damage

Defective stitching around sewn termination

Defective Petzl Grillon:

Cracks or distortion around attachment point

Damage to plastic handle

Failure to lock during function test

Missing locking securing screw (See Fig. 2)

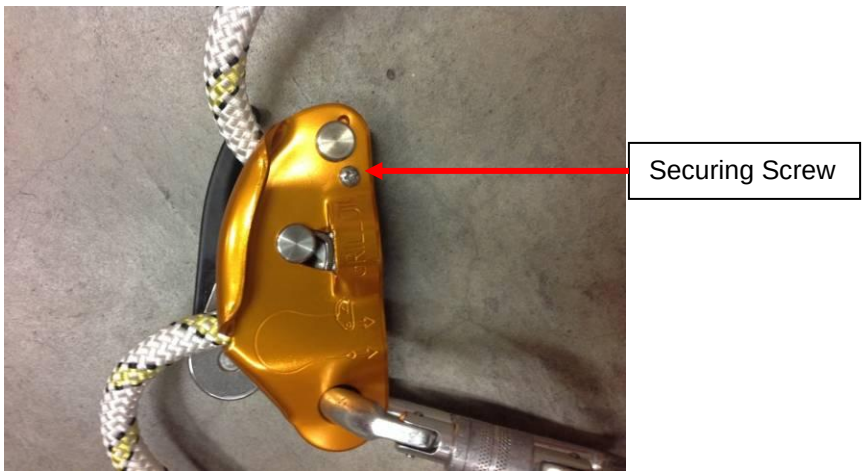


Figure 2

NOTES

FALL ARREST TWIN LANYARD

NOTES

Only those personnel who have received training in the use of the fall arrest lanyard should use this piece of PPE

The fall arrest lanyard is intended to be used in conjunction with the RGH12 harness and an appropriate anchor to provide a ‘fall arrest’ system (see operational use section) for personnel working at height

The fall arrest lanyard consists of:

2 x Scaffold Hooks

2 x Webbing Lanyards

1 x Fall arrest Block

1 x Karibener

Inspection

The lanyard should undergo a visual and tactile inspection:

before use

quarterly as part of a scheduled maintenance routine

annually as part of a more detailed examination by a ‘competent’ person

Defects

NOTES

The following defects will result in the lanyard being taken out of service.

Defective scaffold hook, which may include:

- Ability of the gate to open without the rear latch being depressed (inadvertent opening)
- Cracks or distortion to the metal work
- Significant corrosion

Defective Lanyards:

- Any cuts, burns or holes in the webbing
- Any significant damage to load bearing stitching (load bearing stitching can be identified by its contrasting colour in relation to the webbing).
- Any significant contamination of webbing components with oil, grease, petrol, acids, rust or similar contaminants.
- If a lanyard reaches its obsolescence date (5 years from 1st use)

Defective Fall Arrest Block:

- Any indication of deployment
- Significant damage to outer plastic sheath
- If a block reaches its obsolescence date (5 years from 1st use)

1.2M WEBBING SLING

NOTES

Only those personnel who have received training in the use of slings should use this piece of PPE.

The 1.2m webbing sling is intended as an ancillary component to be used for establishing anchors or extending systems.

Inspection

The lanyard should undergo a visual and tactile inspection:

- before use
- quarterly as part of a scheduled maintenance routine
- annually as part of a more detailed examination by a 'competent' person

Defects

The following defects will result in the lanyard being taken out of service

Defective Lanyards:

- Any cuts, burns or holes in the webbing
- Any significant damage to load bearing stitching (load bearing stitching can be identified by its contrasting colour in relation to the webbing).
- Any significant contamination of webbing components with oil, grease, petrol, acids, rust or similar contaminants.

If a lanyard reaches its obsolescence date (5 years from 1st use

NOTES

KARIBENER

Only those personnel who have received training in the use of karibeners should use this piece of equipment.

Karibeners are intended as ancillary components to be used for establishing anchors, extending systems or connecting other elements of the equipment.

The following are key features in the use of karibeners:

Always load the karibener along it's spine

Never allow the karibener to be loaded across it's gate (cross loading)

Always Load Along Spine

Never Cross Load

NOTES

Ensure the gate is locked when in use

Inspection

The karibener should undergo a visual inspection:

before use

quarterly as part of a scheduled maintenance routine

annually as part of a more detailed examination by a ‘competent’ person

Defects

The following defects will result in the karibener being taken out of service:

Defect to the locking collar preventing the karibener being locked

Significant corrosion causing pitting

Defective return spring on the gate

Deformation or cracks to metal work

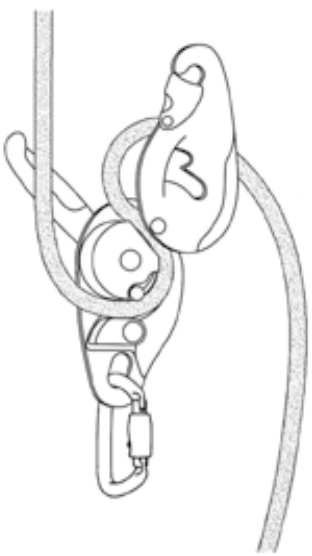
PETZL ID

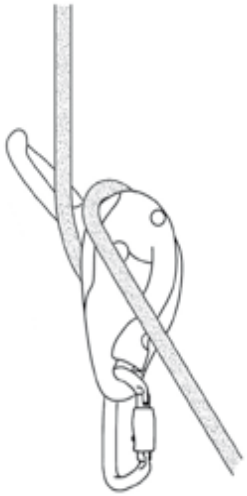
Only those personnel who have received training in the use of the Petzl ID should use this piece of equipment.

Although the Petzl ID is a multi functional item of equipment, its use within the Work at Height kit is limited to the establishment of a temporary lifeline.

The following diagrams indicate the correct method of loading the Petzl ID:

NOTES





Inspection

The Petzl ID should undergo a visual inspection:

before use

quarterly as part of a scheduled maintenance routine

annually as part of a more detailed examination by a ‘competent’ person

Defects

The following defects will result in the Petzl ID being taken out of service:

Any distortion, cracks or significant corrosion to the metal components

Failure of unit to lock rope under load

Any significant damage to plastic components

NOTES

25M BELAY ROPE

The 25m Belay Rope is intended as an ancillary component to be used for establishing anchors or extending systems

Inspection

The 25m Belay Rope should undergo a visual and tactile inspection:

- before use
- quarterly as part of a scheduled maintenance routine
- annually as part of a more detailed examination by a 'competent' person

Defects

The following defects will result in the 25m Belay Rope being taken out of service:

- Cuts to the outer sheath where the inner core is visible
- Significant contamination with oil, grease, acid, rust or similar contaminants
- Swelling of the rope indicating internal core damage
- If a lanyard reaches its obsolescence date (5 years from 1st use)

WIRE SLING

NOTES

The Wire Sling is intended as an ancillary component to be used for establishing anchors or extending systems

Inspection

The Wire Sling should undergo a visual inspection:

before use

quarterly as part of a scheduled maintenance routine

annually as part of a more detailed examination by a ‘competent’ person

Defects

The following defects will result in the Wire Sling being taken out of service:

Significant corrosion

Significant numbers of broken wires

Significant damage to protective plastic covering

6. Operational Use

INTRODUCTION

The work at height training and equipment is intended to provide personnel with the means to establish a safe system of work when it is necessary to work at height. **It is not intended as a rope rescue capability or for the**

suspension of firefighters in situations where there is no other means of primary support (primary support may include a floor, flat roof, ladder, pitched roof or any other surface where personnel can work without relying on equipment to support them).

NOTES

SAFE SYSTEMS OF WORK

Anchor Selection

Anchors fall into two broad categories of natural and man made. However, the procedure for ensuring their suitability is the same.

Dynamically risk assess the anchor by:

Visual examination to ensure no obvious signs of weakness

Physical examination by applying loading to the anchor prior to entering risk area

Visual and physical examination to ensure compatibility of equipment which will come into contact with anchor (abrasive edges, sharp corners)

Use of edge protection or suitable equipment to protect against abrasive damage (wire slings, canvass runners)

Work Restraint

The objective of work restraint (or travel restriction) is to restrict an individual's movement

so that access to any location where there is a risk of a fall from a height is not possible.

Figure 1 (Safe)

Figure 2 (Unsafe)

In figure 1 above, although the firefighter is beyond the barrier (an existing safe place of work), the adjustable lanyard does not allow him to reach a position where a fall could occur. This is the safe and appropriate use of the 5m adjustable lanyard.

In figure 2 above, the firefighter is using the lanyard to support his weight in order to obtain a better viewpoint. This is an unsafe practice and relies on the lanyard for primary support. A failure of the lanyard will result in a fall. This principle applies in all aspects of working at height.

The 5 m adjustable lanyard is to be used in conjunction with the RGH12 harness a suitable anchor point and any necessary ancillary equipment.

The lanyard should be attached to the front attachment point of the harness by means of the karibener attached to the self locking traveller. The lanyard should then be attached to the chosen anchor point by means of the scaffold hook.

Sufficient rope should then be pulled through the traveller to allow access to the risk area by compressing the top section of the traveller.

Under no circumstances should personnel walk towards a risk area whilst holding the traveller and paying out rope. Should they trip, it is unlikely that they will release the traveller in time to prevent a fall.

Where insufficient rope has been paid out, personnel should step back from the risk area and adjust the rope length accordingly.

Where too much rope has been paid out, personnel should take in the slack rope until such times as the lanyard affords protection from a fall.

FALL ARREST

If circumstances demand that individuals operate in a position where it is not possible to avoid working at height or preventing a fall, then suitable fall arrest equipment must be used. Although the primary hazard is that of falling a distance likely to cause injury, the potential and likely consequences of a falling person striking adjacent objects or surfaces should also be assessed. The Fall Arrest Twin Lanyard has been included in the WAH kit for such circumstances.

NOTES

Personnel should never use this equipment in a configuration where one leg of the lanyard is attached to an anchor and the other attached to their harness. Both lanyards should be attached to the anchor or the second lanyard left hanging free.

When using the Fall Arrest Lanyard it is always advisable to select an anchor point above head height but in any case never choose an anchor point below the level of the harness attachment (chest height).

Ensure, wherever possible, that there is sufficient clearance to allow full deployment of the lanyard in the event of a fall. However, in circumstances where all other options have been exhausted (avoid, prevent etc) and it is necessary to work at levels below full deployment height, it is still advisable to make use of the Fall Arrest Lanyard, providing that the recommended practice of anchoring above chest height is adhered to.

Vertical and Horizontal Movement Using Fall Arrest Lanyard

Where the urgency of a situation dictates that firefighters are committed to working in an environment where there is a risk of fall, the use of the fall arrest lanyard may be considered as an appropriate control measure. The circumstances where this is likely to occur are felt to be limited but may include:

Climbing an unprotected vertical ladder where the distances to be climbed are significant (e.g. Telecoms Mast, Wind Turbines).

Maintaining contact with a safety system or series of anchors whilst moving horizontally or on a steep incline such as a pitched roof or embankment (Figure 4)

Note: Work at height equipment is not intended as a primary means of support. Personnel must not abseil or otherwise use the work at height equipment on steep inclines or pitched roofs as a primary means of support.

NOTES

NOTES

Figure 3

Figure 4

TEMPORARY LIFELINE

A temporary life line is intended to allow a running anchor, in situations where horizontal movement is needed and appropriate anchor points can be found in order to establish such a system. The establishment and use of a temporary lifeline is governed by the following guidelines:

The maximum distance between anchors or running belay points (see below) is 5m

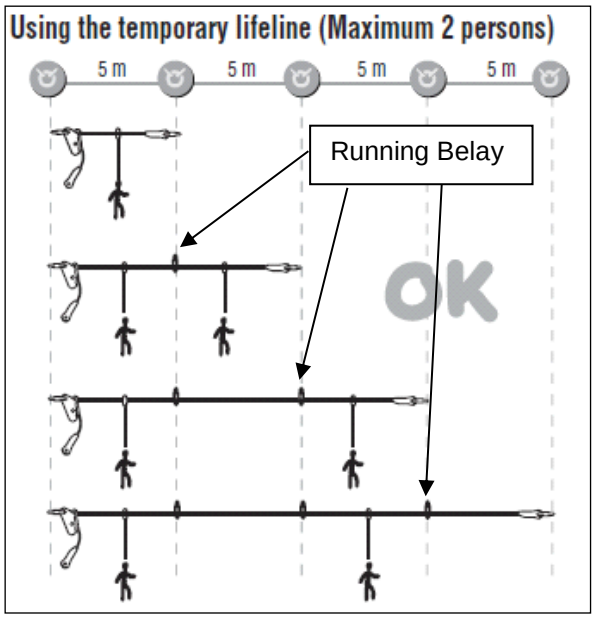
The maximum number of personnel allowed to use the lifeline at any one time is two.

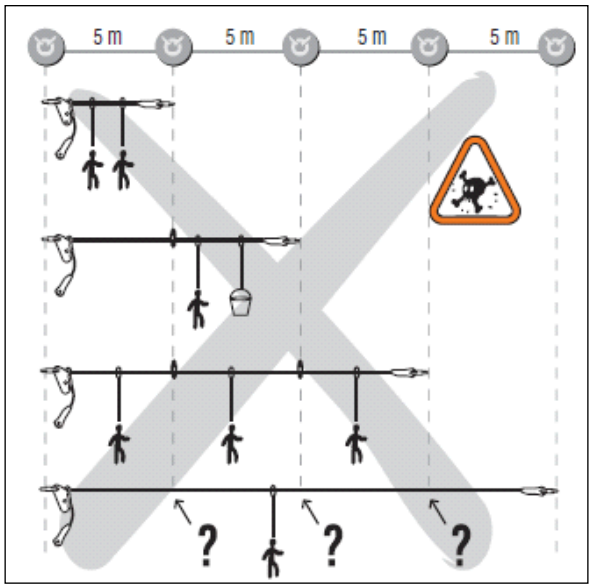
Only one person may be attached to any section.

Personnel should never rely on the lifeline as a primary means of support

Ensure all anchors, running belays are sufficient to support the load which **may** be applied in the event of a fall.

NOTES


Using the temporary lifeline (Maximum 2 persons)
5 m
5 m
5 m
5 m
Running Belay
OK


5 m
5 m
5 m
5 m
?
?
?

7. Equipment Maintenance

NOTES

OBVIOUSLY DEFECTIVE EQUIPMENT

Removed from service and returned to Transport Department for repair or replacement.

SUSPECTED DEFECTIVE EQUIPMENT

Removed from service and quarantined until examined by a ‘competent person’ (Transport Department).

CLEANING

Webbing and Rope:

All webbing and rope items, including harnesses, may be washed in warm water using a mild detergent such as Dreft

Rinse thoroughly

Allow to dry in a warm place. **Do not use direct heat**.

Only stow when dry

Other equipment:

Wash in warm water using a mild detergent

Heavily soiled items should be cleaned using a soft brush.

Do not lubricate

Stow when Dry