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SAFETY AND HEALTH TOPIC SHEET NO. 28: MISUSE OF ANCHORS

This safety and health 'topic sheet' aims to:

- *raise awareness on the subject of the misuse of anchors (particularly temporary and counterweight anchors);*
- *include information regarding the usage of equipment in accordance with the manufacturer's instructions, risk assessment and the related hazards.*

1 INTRODUCTION

1.1 The anchor system is of primary importance in the rope access system and should be unquestionably reliable (see ICOP, Clause 2.11, *Primary rope access work methods*).

1.2 Two independent anchors – one for the working line and one for the safety line, and each with a static strength of 15 kN or more – should be linked together for added security (see ICOP, 2.11.2.9).

> **Rope access safety supervisors are responsible for checking that anchor lines are correctly rigged.**
>
> *Note: Rope access safety supervisors must be a Level 3 rope access technician.*

1.3 There should be suitable arrangements in place at every worksite to provide rapid workmate rescue/retrieval. These should include an appropriate site-specific plan, together with equipment, rigging and anchors of adequate strength for workmate retrieval (see ICOP, Clause 1.4.2.7.1).

2 WHAT CAN GO WRONG…

2.1 There are many different types of anchor device. These generally fall into two broad categories:

- those that are installed into the structure or natural feature (installed anchor devices), e.g. eyebolts fixed to concrete, brick, block-work or steel beams; anchor rails; paired anchors; ground anchors;
- those that are placed without installation into the structure or natural feature (placed anchor devices), e.g. tripods; scaffold hooks; deadweight anchors; counterweight anchors; anchor slings; beam clamps.

2.2 The failure of one or more anchors – for example, because of lack of planning and poor placement – is likely to result in serious injury or death.

2.3 In addition, work – as well as rescue – can be compromised by the poor selection and use of anchorages, anchorage points, anchor devices and/or anchor points.

3 WHY THINGS CAN GO WRONG…

3.1 Failure may result from:

- the absence of adequate procedures;
- the lack of a suitable risk assessment;
- inadequate planning, e.g. anchor selection, positioning, rescue provision;
- poor design and installation;
- lack of testing and inspection;
- ineffective onsite management and supervision;
- inadequate checking;
- inadequate management of change, e.g. changes to the scope of work; the location of work; changes to the team; modification, alteration, or additions to the anchor system;
- the work environment;
- human factors, e.g. lack of awareness, deliberate violation, complacency.

4 WHAT YOU CAN DO…

4.1 Anchors should be:

- suitable for the intended use;
- safe for use, maintained in a safe condition and inspected to ensure it is correctly installed and does not subsequently deteriorate;
- used only by people who have received adequate information, instruction and training;
- accompanied by suitable health and safety measures, e.g. manufacturers' information, clearly visible markings, etc.

4.2 General

4.2.1 When selecting, positioning and using anchors, the principle of double protection applies and, therefore, at least two anchors should always be used.

Anchors and anchorages should be unquestionably reliable.

4.2.2 It is essential that great care is taken when selecting anchor devices that they are appropriate to the situation in which they are fitted or to be fitted and used, e.g. that they are the correct type of anchor device for the given situation and that they are positioned and fitted correctly.

4.2.3 Anchors should be of an adequate strength, bearing in mind the mass of the user including any equipment worn or carried.

4.2.4 Rope access technicians should be aware that additional anchors may be required to facilitate workmate retrieval. These should be of adequate strength for at least a two-person load.

Note: Rigged-for-rescue systems can expedite rescue, avoid two-person loads and reduce the need for the rescuer to compromise their own safety.

4.2.5 The subject of selection, fitting and use of anchors is complex. For detailed guidance, see the ICOP (Clause 2.11.2 and Part 3, Annex F, *Safety considerations when installing or placing anchor devices for use in rope access*).

4.3 Installation and Placement

4.3.1 The installation or placement of anchor devices should only be carried out from a safe place.

4.3.2 When deciding where anchor devices are to be installed or placed, account should be taken of the envisaged work to be carried out from them, e.g. that the point where a descent starts is directly above the intended place of work.

Anchor devices should be installed or placed in such a way that they can only be loaded in the directions intended by the manufacturer. All aspects of installation, placement and use should follow the manufacturer's instructions.

4.3.3 Anchor devices should be positioned so that attached anchor lines avoid contact with any hazardous surface, e.g. edges; abrasive or hot surfaces.

4.3.4 If it is not possible or reasonably practicable to position the anchor devices in this way, the anchor lines should be appropriately protected against such hazardous surfaces, e.g. by the use of edge protectors or anchor line protectors (see ICOP, Annex P, *Recommended actions for the protection of anchor lines*).

4.3.5 When it is necessary to re-anchor an anchor line, e.g. to avoid abrasion or to allow a change of direction, the anchors should be installed or placed so that any potential loads are in shear.

4.4 Maintenance

4.4.1 Permanently installed and permanently placed rope access anchor systems should be provided with information relating to the installation or placement and with user instructions. These anchor systems should be subjected to appropriate inspection and, where appropriate, testing procedures, which should be recorded.

4.4.2 Anchor devices, or any component or element of them, should not be modified from the condition in which they were supplied without the manufacturer's written approval, as any modification might affect the performance of the anchor device and could also cause it to fall outside the manufacturer's specification.

Rope access technicians should be aware that additional anchors may be required to facilitate workmate retrieval.

5 HOW YOU CAN DO IT

STOP – LOOK – THINK – DECIDE

5.1 Deadweight Anchors

The performance of a deadweight anchor or combination of deadweight anchors relies primarily on the amount of friction between the deadweight anchor device and the surface upon which it is placed. Strictly follow the manufacturer's guidance. Ensure that:

- there are sufficient weights and that these are correctly positioned on the frame of the deadweight anchor.
- the strength of the roof or other surface is sufficient for the weights intended to be applied;
- the minimum distance from the edge of the roof or other surface to the deadweight anchor is as specified by the manufacturer;
- the presence of a parapet or upstand does not impede the functioning of the deadweight anchor device.

5.2 Counterweight Anchors

The performance of a counterweight anchor relies primarily on the combination of the amount of mass placed at its inner end and, very importantly, the position of the pivot point towards the outer end of the arm, i.e. the end that projects over the edge of the structure. This combination has to be correct to prevent the weighted base from lifting from the surface on which it lies when it comes under load.

Unless a counterweight anchor has been designed specifically for rope access, it is strongly recommended that an engineering assessment is made as to its suitability, bearing in mind that a load in a fall could be higher than that in normal swing stage use.

The arm should only be rested on a parapet if it can be verified that the parapet is strong enough and stable enough to support the load, including any lateral load. This may require the services of an appropriate engineer.

6 EXAMPLES OF POOR PRACTICE

6.1 The following photographs provide examples of poor practice:

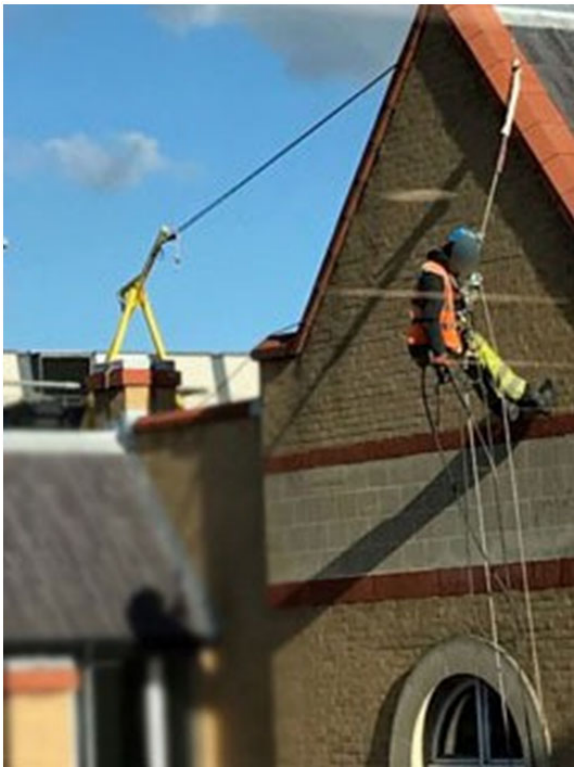

Figure 1 *- Use of a placed anchor device outside the manufacturer's instructions. Poorly assessed deviation and rope protection. Rescue complexities.*

Figure 2 *- Poor anchor selection and anchor lines positioning. Reliance on an unproven handrail. Risk of a swing fall.*

(a)

(b)

(c)

Figure 3 *– Anchor devices not used in accordance with the manufacturer's instructions.*

Figure 4 - *Anchor device not used in accordance with the manufacturer's instructions. Lack of adequate edge protection (Note: Each rope should have independent rope protection).*

Image (a)

Image (b)

Figure 5 *– Inadequately considered anchor line protection. Poor planning.*

7 ACTION

7.1 Review your management system's procedures. Provide feedback on things that need improving or don't reflect the way you undertake your work.

8 REFERENCES

8.1 Further information can be found in the IRATA *International code of practice for industrial rope access* (ICOP):

- 2.7.9, Anchors
- 2.11.2, The anchor system (anchors and anchor lines)
- Annex F, Safety considerations when installing or placing anchor devices for use in rope access
- Annex P, Recommended actions for the protection of anchor lines

8.2 For a list of current (and archived) 'safety communications' by IRATA, see www.irata.org.

9 RECORD FORM

9.1 An example Safety and Health Topic Sheet: Record Form is given below. Members may have their own procedure(s) for recording briefings to technicians and others.

10 FURTHER READING

10.1 Examples of appropriate standards for anchor devices are BS 7883, BS 8610 and EN 795.

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM					
Site					
Date					
Topic(s) for discussion			Topic Sheet No. 28: Misuse of anchors		
Reason for talk					
Start time			**Finish time**		
Attended by *Please sign to verify understanding of briefing*					
Print name			**Signature**		
Continue overleaf (where necessary)					
Matters raised by employees			**Action taken as a result**		
Continue overleaf (where necessary)					
Briefing leader *I confirm I have delivered this briefing and have questioned those attending on the topic discussed.*					
Print name		**Signature**		**Date**	
Comments					