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SAFETY BULLETIN NO. 42: FALLING OR DROPPED OBJECTS

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of used as part of a toolbox talk.

1 INTRODUCTION

1.1 'Falling or dropped objects' is one of three consistently significant areas of concern for rope access technicians. Incidents occur as a result of:

- Objects being dislodged (Case Study 1)
- Objects falling accidently (Case Study 2)
- Being struck by a falling object (Case Study 3)
- Lack of a risk assessment (Case Study 4)
- Objects being dropped (Case Study 5)

2 WHAT CAN GO WRONG

2.1 The following are examples of things that have gone wrong:

Case Study 1 Object dislodged
A L2 technician was approximately 1 m under an edge, descending to the work site. With his feet he pushed on the topside of the window. The windows were such that it can be pushed open from the inside at the bottom; the top thus turning inwards. Not knowing this, and added to the fact that the device normally holding the window open was broken and had been replaced by the owner of the house with a 1 kg dumbbell, resulted in the fall of the dumbbell into the exclusion zone.
Work was stopped for the day. The operation of windows was explained in a toolbox later. The exclusion zone was made larger. The house owners were asked to check their windows before work could commence.
Discuss what went wrong and what you might have done differently: …

Case Study 2 Object falling accidently
A small part of a scraper blade fell from the top of a building whilst a rope access technician was cleaning the steel structure to remove any rust and corrosion.
The project coordinator initiated a toolbox talk and shared the lesson learnt. The scraper blade was removed from service and replaced by a spatula.
Discuss what went wrong and what you might have done differently: …

Case Study 3 Struck by a falling object
A L2 technician was planning to access an electrical box. Upon looking up a vessel a small concrete block (refractory) came loose from 100 feet - well above the anchor point (25 feet high) - and struck the technician in the face. The technician suffered from a small cut below the eye, underneath their safety glasses.
The client had cancelled a refractory repair scheme in order to reduce costs, due to low oil prices. Investigation by the client deemed that the technician did not inspect fully the "line of fire" above them and therefore put themselves at risk.
Discuss what went wrong and what you might have done differently: …

Case Study 4 Lack of a risk assessment
Whilst tensioning a bolt inside a wind turbine tower, from floor level and from a step ladder, the hydraulic bolt tensioner (25kg) was unstable on top of the bolt, came off and flew 2 to 3 metres; landing on the head of the other worker.
The tool was provided by the customer. The rope access company did not undertake a task-specific risk assessment of the tool; when the problem should have been noticed. The result was a 'less than 7-day' injury.
Discuss what went wrong and what you might have done differently: …

Case Study 5 Object dropped
Whilst a L2 rope access technician was busy removing lights from a building the light shade broke off and fell to the ground.
The area was cleaned and the barricaded exclusion zone was monitored. Bags were fixed around the light shades to prevent them from falling to the ground. A toolbox talk was undertaken as reminder that technicians must be vigilant when working with fragile equipment.
Discuss what went wrong and what you might have done differently: …

3 RISK MANAGEMENT

3.1 The following advice outlines the risk management measures that should be considered when planning jobs.

3.2 There is a hierarchy of controls for falling or dropped object risk management:

- Elimination;
- Engineering controls;
- Administrative controls; and
- Personal protective equipment.

4 ELIMINATION

4.1 Where possible, the elimination of a hazard - or avoidance - must always be the preferred option.

5 ENGINEERING CONTROLS

5.1 If the hazard cannot be eliminated, engineering controls are the preferred approach to risk reduction. This involves the use of equipment to reduce the potential for dropped objects (or, preferably, prevent them from being dropped), or to reduce the risk if an object does fall.

6 ADMINISTRATIVE CONTROLS

6.1 Administrative controls, to be used in conjunction with the other controls in the hierarchy, involve providing:

(i) information and warnings;

(ii) instruction on how to carry out the work safely;

(iii) supervision to ensure that any procedures are being followed; and

(iv) management processes to determine any 'lessons learnt'.

7 PERSONAL PROTECTIVE EQUIPMENT

7.1 This is the last method of protecting an employee.

7.2 Industrial safety helmets provide limited protection only, due to the high level of kinetic energy that falling and dropped objects possess. A helmet protects the head only, so other areas of the body are unprotected from dropped objects and serious injuries can easily be suffered, e.g. face.

8 FURTHER INFORMATION

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access: https://irata.org/downloads/2055

(b) IRATA Work and Safety Analysis 2016: https://irata.org/downloads/2054

(c) IRATA Safety and Health Topic Sheet No. 11, HS-091ENG

(d) DROPS, http://www.dropsonline.org/

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

9 RECORD FORM

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

IRATA SAFETY BULLETIN – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:	Safety Bulletin No. 42: Falling or dropped objects		
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:					

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SAFETY BULLETIN NO. 43: EYE PROTECTION

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of used as part of a toolbox talk.

1 INTRODUCTION

1.1 Employers have duties concerning the provision and use of personal protective equipment (PPE) at work. PPE is equipment that will protect the user against health or safety risks at work. It includes eye protection.

1.2 PPE is "a last resort". Even where engineering controls and safe systems of work have been applied, some hazards might remain. These include injuries to the eyes, e.g. from flying particles or splashes of corrosive liquids. PPE is needed in this case to reduce therisk.

2 WHAT CAN GO WRONG

2.1 The following are examples of things that have gone wrong:

Case Study 1 Cut below safety glasses
Technician was planning to access an electrical box. Upon looking upwards at a vessel, a small concrete block (refractory) came loose [approximately 100 feet] well above the anchor point [25 feet high] and struck the technician in the face. The technician suffered from a small cut below the eye, under the technician's safety glasses.
The client had cancelled a refractory repair scheme in order to reduce costs due to low oil prices. Investigation by the client deemed that the technician did not fully inspect the 'line of fire' above them and therefore put themselves at risk.
Discuss what went wrong and what you might have done differently: …

Case Study 2 Particle blown into eye
Whilst busy with surface preparation, a gust of wind blew rust particles into the technician's eye.
First aid treatment was administered. Employees performing surface preparation to wear goggles and not safety glasses
Discuss what went wrong and what you might have done differently: …

Case Study 3 Particle blown into eye
Employee was walking over a link bridge when he was hit by a strong gust of wind and felt something enter his left eye. He washed out what he perceived to be a bit of dirt. That evening, he awoke early feeling a lit bit of discomfort. He decided then to seek medical assistance. A medic examined the eye and applied some eye drops.
The technician was able to return to work the next day. Irritation eased as the day went on and it did not affect his work. All procedures were correctly followed. The team leader took the opportunity to discuss dust down procedures and the use of safety glasses, at the subsequent morning briefing.
Discuss what went wrong and what you might have done differently: …

Case Study 4 Particle blown into eye from adjacent work
A technician was injured when a particle became lodged in his eye. A medic was unable to remove it. The technician required onshore medical treatment.
Awareness of risks caused by nearby activities is as important as awareness of risks from your own activities.
Discuss what went wrong and what you might have done differently: …

3 HAZARDS

3.1 Damage to eyes may occur as a result of chemical or metal splash; dust; projectiles; gas and vapour; and/or radiation. More commonly:

(a) **Impact hazards**

- These are caused by fast moving particles, e.g. chipping, grinding, cutting, broken tools, grinding wheels. The potential impact speed must be assessed when selecting the most appropriate grade of eye protection. If safety glasses could be dislodged then goggles or a face shield might be more appropriate. Consider double eye protection when grinding, cutting, etc.

(b) **Chemical splash**

- Chemical splash and vapours can strike a technical from all sides. Accordingly, full eye enclosure is important, e.g. unvented goggles. A full face shield may be appropriate in protecting the whole face from splashes of liquids. Where there is a danger of splash deflecting up from a work surface a chin guard may be required.

(c) **High-speed flying articles**

- High-speed flying particles may enter the eye, often indirectly. In extreme conditions, a full face shield offers the maximum protection. Full face shields offer a wide area of protection; and as a result of all round ventilation they remain mist free even in wide temperature ranges.

4 SELECTION AND USE

4.1 When planning work, you should ask yourself who is exposed and to what. Make sure that the eye protection chosen (e.g. safety spectacles, goggles, face screens, face shields, visors, etc.) has the right combination of impact, dust, splash, molten metal eye protection for the task and fits the user properly.

4.2 Select products that meet a recognised standard. Some countries will have specific requirements, e.g. CE marking in the European Union.

4.3 Choose equipment that suits the user properly. Consider the size, fit and weight. If technicians help choose the eye protection, they will be more likely to use it.

4.4 If more than one item of PPE is worn at the same time then make sure they are compatible and can be used together, e.g. wearing safety glasses may disturb the seal of a respirator, causing air leaks.

4.5 Instruct and train technicians on how to use any eye protection. Communicate with them on why it is needed, when to use it and what its limitations are. They must also know how to detect and report any faults.

4.6 Check with your supplier on which eye protection is most appropriate. Explain the job to them. If in doubt, seek further advice from a specialist adviser.

4.7 Ensure that employees have read and understand the relevant safety data sheet – and consequential assessment - for any hazardous substance(s) being used.

4.8 An employer should provide instructions, procedures, training and supervision to encourage people to work safely and responsibly. Do not allow exemptions from wearing eye protection for those jobs that, “only take a few minutes”.

4.9 Report all injuries immediately they occur. Do not wait until the following day.

5 MAINTENANCE

5.1 Eye protection must be properly looked after and stored when not in use, e.g. in a dry, clean environment. It must be cleaned appropriately and kept in good condition.

6 MONITOR AND REVIEW

6.1 Other points to remember are:

- Check regularly that eye protection is being used. If it isn’t, find out why not.
- Safety signs can be a useful reminder that eye protection should be worn.
- Take note of any changes in equipment, materials and task; you may need to update the eye protection that you provide.
- Technicians must make proper use of eye protection and report its loss or destruction or any fault in it.

7 FURTHER INFORMATION

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access: https://irata.org/downloads/2055:

- Part 2, 2.7.14.5 (b)

(b) IRATA Work and Safety Analysis 2016: https://irata.org/downloads/2054

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

8 RECORD FORM

8.1 An example *Safety Bulletin: Record Form* is given below. Members may have their own procedure(s) for recording briefings to technicians and others.

IRATA SAFETY BULLETIN – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Safety Bulletin No. 43: Eye protection	
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:					

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SAFETY BULLETIN NO. 44:
ROPE ACCESS MAIN ROPE FAILURE

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of use as part of a toolbox talk.

DISCLAIMER:

*This safety bulletin - including, where given, any conclusions - is not as a result of any investigation undertaken by IRATA. It is based on information provided by a **non-member** company. IRATA does not attribute any blame; nor provide opinion on any root causes. Neither is any opinion expressed or implied on liability or culpability. The following summary is provided to assist others in applying any 'lessons learnt'. Rope access is defined in the IRATA ICOP, Part 1, 1.3, Definitions. In essence, it is a two-rope system (working line and safety line). For the purposes of this summary, any reference to 'on-rope' or 'off-rope' should be construed accordingly.*

1 INTRODUCTION

1.1 This safety bulletin summarises the findings of a main rope failure.

2 BACKGROUND INFORMATION

2.1 Date of incident: March 2017

2.2 Time of incident: 2.20pm

3 WHAT WENT WRONG

3.1 **Task being performed when the incident occurred:**

A technician - undertaking non-destructive testing - was ascending a rope access system to reach their work area.

3.2 **Detail:**

3.2.1 A rope system was rigged by a Level 3 rope access technician over an insulated pipe, to establish a high-point deviation (sometimes known as an "up and over" directional). See **Figure 1**. Both the main rope and the safety rope were placed in a single, fabric rope protection sleeve to guard against rough and uneven surface hazards.

3.2.2 The technician ascended the ropes from ground-level. When the main rope was loaded, the system moved laterally such that it made contact with an exposed metal plug located on top of the insulated pipe.

NOTE: The surface temperature of the 1" diameter metal plug was found later to be approximately 550 degrees Fahrenheit (288 degrees Celsius).

3.2.3 Once the technician reached approximately 6 metres in elevation, the hot plug melted through both the rope protector (nylon/canvas) and the main rope to the point of failure. The technician fell approximately 1 metre until arrested by their back-up safety system. The technician immediately transferred body weight to the adjacent structure and, secured in position with an additional anchorage, waited until a new set of ropes were lowered into position.

3.2.4 After a safe descent was complete the team cleared the equipment, exited the unit, notified operations and stopped work.

3.2.5 An inspection of the damaged equipment involved showed that the main rope had melted through and the back-up safety rope had melted half through (approximately). See **Figure 2**.

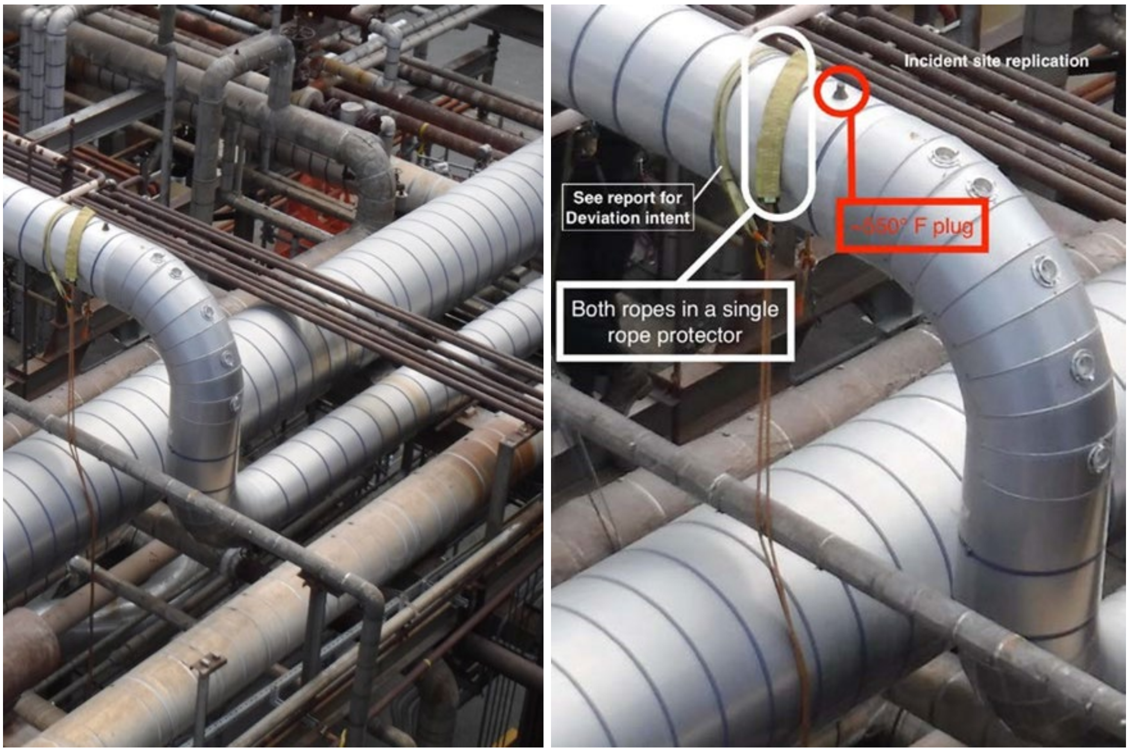

Figure 1: Recreation of the incident scene

Figure 2: Damaged ropes and rope protector

3.3 **Effects of the incident:**

- The team members were shaken, even though no injuries were sustained.
- Rope access equipment was damaged.

3.4 **Actions taken immediately following the incident:**

- The unit's operations department were notified and work stopped.
- A safety 'stand-down' took place at the site and an investigation was initiated.
- The rope access teams reviewed the incident, discussed mitigating steps and returned to work.

4 PRIMARY AND CONTRIBUTORY FACTORS

4.1 **Primary causes of the incident:**

The primary causes identified were:

(a) Failure to identify the heated metal plug on top of the insulated pipe.

(i) Due to its location, the L3 technician did not observe the small and protruding hot metal plug.

(ii) The L3 technician knew the insulated pipe was hot. However, other temperature-related hazards were not identified in the risk assessment in sufficient detail, e.g. exposed metal elements.

(b) The decision to place both ropes in a single rope protector exposed both the main rope and the safety rope to the same hazard simultaneously.

(i) Rigging/anchor angles were a contributory factor. The L3 technician decided that one rope protector was sufficient for potential sharp edges, based solely on the insulation bands encasing the hot pipe. When the technician, below, weighted the system the rope protector caused both the main rope and the safety rope to slide into the unrecognized hot plug hazard.

(ii) The deviation (see **Figure 1**, right) was intended to guard against a different hazard (viz. rope travel over the large pipe's elbow) and, therefore, did not engage the rope system early enough to prevent contact with the hot metal plug.

4.2 **Contributory factors:**

Other contributory factors were:

(a) The L3 technician had extensive off-shore rope access experience, but was new to accessing high temperature piping in a refinery setting.

(b) There was no clear procedural guidance to verify the full rope path prior to clearing the system for technician use, particularly when rigging from above when technicians access the rope system from below.

(c) There was insufficient identification of high temperature hazards in the risk assessment the related job planning and pre-start briefings.

(d) There was no 'line of sight'.

5 CORRECTIVE ACTIONS

5.1 **Steps that would have prevented this incident from occurring in the first place:**

Steps identified were:

(a) Establish enhanced awareness of high temperature hazards, regardless of type, e.g. exposed hot plugs, flanges, valves, etc. Identify and review them as part of any risk assessment and job planning.

(b) Modify the company rope access procedures to highlight enhanced awareness of rope path.

(c) Inspect the full path of the rope system, including potential movement, once the ropes are weighted; or ensure that all hazards are identified and are suitably mitigated.

(d) Separate the main rope and safety rope, including rope protection, whenever possible to reduce the risk of concurrent damage or failure; reducing the risk of total system failure.

5.2 **What should be done to systematically prevent this type of incident in the future:**

(a) **Engineering:**

(i) If possible, cool hot elements before accessing the work area (Example: access process piping during shutdowns).

(b) **Administrative:**

(i) Seek to enhance project planning documents, including the risk assessment and permit-to-work, to take unique heat hazards into account further. Review findings with the site and project team as a key component of pre-job briefings.

(ii) Revise company rope access operational procedures and training protocols to emphasise the need to assess the complete rope path before authorisation is given to use the system.

(iii) Establish enhanced supervision and mentorship of new and/or short service employees who may not be adequately familiar with the job scope or work environment, regardless of prior experience elsewhere.

(c) **Work practice:**

(i) Technicians who are responsible for rigging should ensure that all critical hazards along the rope path are identified and addressed. This includes lateral movement of the system during work. Maintain 'line of site'.

(ii) Technicians should load the primary rope access system to check for movement at the anchorage(s) and rope protection, before committing to ascent or descent.

(iii) Teams accessing process piping should be equipped/utilise infrared temperature guns.

(iv) Work planning should consider the use of high-temperature ropes and/or rope protection solutions suitable to heat-related hazards, as well as wire slings.

(v) Confirm the temperature of the pipework with the plant operator.

(d) **Personal protective equipment:**

(i) Not a factor in this incident.

6 COMMENTS

6.1 The reporter states:

"… 75% of the rope system failed. The technician was possibly seconds away from taking approximately a 15' fall to the ground. The nearness of this near-miss cannot be overstated.

The amount of training and experience a rope access technician has accumulated does not substitute for job/site specific training, detailed project planning and a local mentoring process. These remarks are particularly true when a technician is new to the team, is exposed to new job scopes or is placed in unfamiliar work environments.

Note how these same conclusions are not unique to rope access. Instead, they can be applied to ***any*** *team member regardless of specialty particularly when working in safety sensitive and complex environments. …".*

6.2 IRATA notes that, where possible, deviations should be "engaged" with the working rope, rather than set up to 'catch' the ropes if they move.

7 FURTHER INFORMATION

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition)[1]:

- Part 2, 2.7.10, Protectors for anchor line
- Part 2, 2.11.3, Use of anchor lines
- Part 3, Annex P, Recommended actions for the protection of anchor lines

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (V004 24/12/2019)[2]

- 6.2.3, Hazard identification and risk assessment
- 6.4, Rigging
- 6.4.6, Hazard avoidance and rope protection
- 6.4.8, Deviations
- 6.6.12, Edge obstructions at the top

(c) IRATA Safety and Health Topic Sheets:

- No. 5, HS-085ENG, Safe rigging of rope access equipment
- No. 6, HS-086ENG, The protection of ropes

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

8 RECORD FORM

8.1 An example *Safety Bulletin: Record Form* is given below. Members may have their own procedure(s) for recording briefings to technicians and others.

1 https://irata.org/downloads/2055
2 https://irata.org/downloads/2059

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Rope access main rope failure</td></tr>
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Please sign to verify understanding of briefing</td></tr>
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<tr><td colspan="4">Continue overleaf (where necessary)</td></tr>
<tr><td colspan="4">Briefing leader
I confirm I have delivered this briefing and have questioned those attending on the topic discussed.</td></tr>
<tr><td>Print name:</td><td></td><td>Signature:</td><td>Date:</td></tr>
<tr><td>Comments:</td><td colspan="3"></td></tr>
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SAFETY BULLETIN NO. 45: FALL FROM HEIGHT: AID CLIMBING

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of use as part of a toolbox talk.

DISCLAIMER:

*This safety bulletin - including, where given, any conclusions - is not as a result of any investigation undertaken by IRATA. It is based on information provided by a **non-member** company. IRATA does not attribute any blame; nor provide opinion on any root causes. Neither is any opinion expressed or implied on liability or culpability. The following summary is provided to assist others in applying any 'lessons learnt'. Rope access is defined in the IRATA ICOP, Part 1, 1.3, Definitions. In essence, it is a two-rope system (working line and safety line). For the purposes of this summary, any reference to 'on-rope' or 'off-rope' should be construed accordingly.*

1 INTRODUCTION

1.1 This safety bulletin summarises the findings from two non-fatal falls from height which occurred during the de-rigging of safety nets whilst using aid climbing techniques. The accidents took place on two different sites, with different specialist netting contractors. None of the companies involved were IRATA members. Nevertheless, both technicians injured were IRATA-qualified.

2 BACKGROUND INFORMATION

2.1 Date of incidents: June and July 2017.

2.2 Injured persons: In both cases, IRATA-qualified Level 3 rope access technicians.

3 WHAT WENT WRONG

3.1 **Task being performed when the incident occurred:**

3.1.1 In the first accident, a rope access operative from a specialist netting contractor - employed by a profiled metal decking sub-contractor in turn employed by a steelwork contractor working for a main contractor - was de-rigging safety nets when he fell from height.

3.1.2 In the second accident, the rope access operative who fell was also de-rigging safety nets. The contractual chain was similar, although the rope access contractor was employed by a specialist netting contractor.

3.1.3 Both accidents were very similar and resulted in a fall of approximately 8 metres when beam gliders, being used as anchor devices, came off the bottom flange as a result of an 'open end'.

3.2 **Detail:**

3.2.1 The safety nets had been installed to provide collective protection for the installation of the profiled metal decking (permanent formwork) used to construct the composite steel-concrete floor slab.

3.2.2 In order to de-rig the safety nets rope access techniques had been selected.

3.2.3 A rope access team, comprising two technicians, used aid climbing techniques to traverse the bottom flange of the steel beams and release any safety net anchors ('claws') secured to the bottom flange.

3.2.4 In both cases, the IRATA-qualified Level 3 technician used three 'beam gliders' (sometimes referred to as 'dover clamps') as anchor devices. These were adjusted to fit the bottom flange. The beam was traversed progressively with a minimum of two points of suspension maintained at all times.

3.2.5 **First accident:** When the end of a beam was reached it was necessary for the technician to reposition themselves on the other side of the steelwork connection, so that de-rigging could continue. In order to do this, and to attach their third beam glider to the bottom flange in the adjacent span, he needed to lean across and release the first safety net anchor. This involved grabbing the rigged safety net - which had some tension in it - and pulling it towards him.

Photo 1:
First accident: Look upwards at the area to be de-rigged (left) and the area that had just been de-rigged.

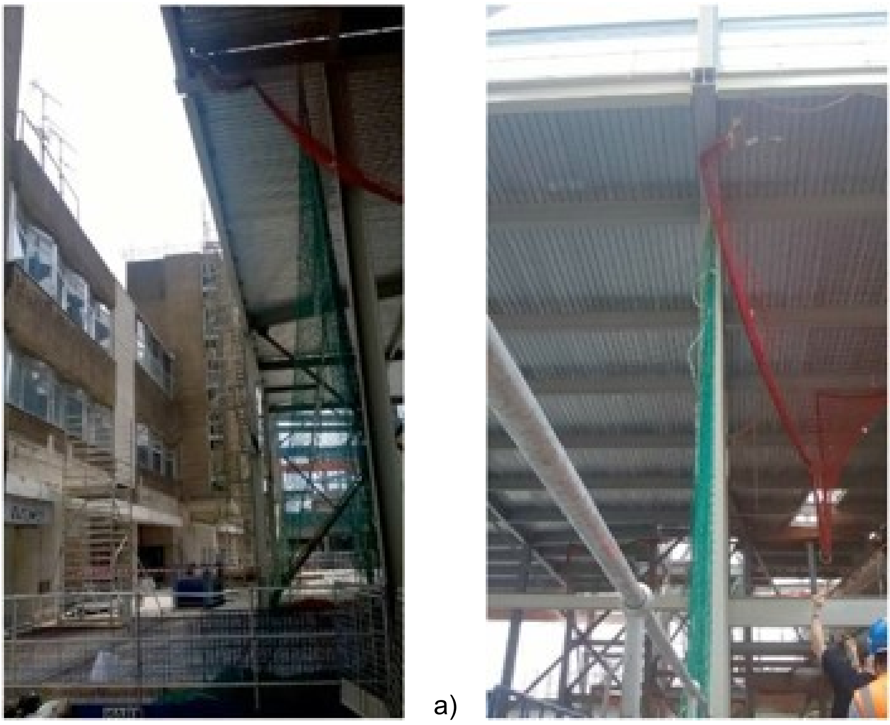
NOTE:
The width of the bottom flange reduces from 200mm wide (right) to 150mm wide (left). The depths of the beams were also different.

3.2.6 There was a gap between the bottom flange of the beam and the flange of its connecting column. This dimension was such that it did not prevent the wheels on the beam glider passing through it. Thus, this resulted in the technician falling from height when losing both his primary support and back-up when the beam gliders were pulled off and/or fell off the open end of the bottom flange (see **Photo 2**).

Photo 2:
First accident: Beam glider at open end of beam (37mm wide gap) [Reconstruction]

3.2.7 It appears that the equal and opposite horizontal reaction had not been recognised; and the direction of loading was no longer purely vertical.

3.2.8 **Second accident:** The technician, using three beam gliders, was travelling along the steel beam and did not identify an open-ended bottom flange, where two beams met. He pulled himself past this gap, which resulted in the primary and back-up support being lost and a fall occurring.



a) b)

Photo 3:
The location of the fall in one of the incidents

3.3 **Action(s) taken immediately following the accidents:**

- After the first incident a "rope access permit to work" was introduced. This required a work area hazard check as well as a specific task assessment briefing.
- A review of all designs will be conducted and, where the distance from the floor to the underside of the steelwork is greater than 4 metres, i.e. beyond the capabilities of a remote attachment device (sometimes known as a 'reach pole'), a hole will be drilled to one side of the bottom flange to allow a bolted cleat or a mobile anchor (sometimes known as a 'man lock') to be installed before the beam is lifted into position.

4 PRIMARY AND CONTRIBUTORY FACTORS

4.1 **Primary causes of the incident:**

The primary causes identified were:

(a) 'open ended' bottom flange detail due to specification of differing member sizes;

(b) the potential for an equal and opposite horizontal reaction had not been recognised;

(c) in the second case, the work was taking place in an area away from that planned as the original area was not available.

4.2 **Other contributory factors:**

Other contributory factors included:

(a) The steelwork connection had not been detailed with an end plate or 'stop' (for example);

(b) When planning and briefing the task the Level 3 technicians did not recognise (from either the plans or site observation), that there was an open end;

(c) When suspended beneath the beam the technicians did not observe that they might lose both their primary and secondary support whilst working close to an open end;

(d) The technicians had no specific training in the use of beam gliders.

NOTES:
1. The use of beam gliders is not covered within the IRATA syllabus.
2. In the UK, FASET run an industry-specific qualification for specialist net rigging (https://www.faset.org.uk/).

(e) In one instance, another form of access to de-rig the nets was available and access below could have been gained via a mobile elevating work platform (MEWP). This was the chosen method and the reason no plan for rope access was made.

NOTE:
A good practice guide has been published by FASET to assist in the selection of the most appropriate method for the rigging and de-rigging of safety nets[1].

4.3 **Other issues**

4.3.1 Particular consideration needs to be given to the method(s) of rescue adopted during aid climbing. In one instance the rescue rope was carried by the Level 3 technician who fell, leaving his relatively inexperienced Level 1 colleague to retreat unsupervised to a safe place.

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1 The selection of access methods to install and dismantle safety netting https://www.faset.org.uk/guidance/safety-netting/ FASET-BP-01-Access-Methods (available as a PDF download)

5 CORRECTIVE ACTIONS

5.1 **Steps that would have prevented this incident from occurring in the first place:**

5.1.1 Steps identified were:

(a) designing the steelwork in such a way as to eliminate or substantially reduce open ends or cut outs; or if these are necessary;

(b) introducing cleats or 'man locks', for example, that would prevent a beam glider leaving the steelwork (see 3.3);

(c) considering the use of locking beam gliders which can be clamped to prevent unplanned movement;

(d) ensuring a thorough pre-start check is carried out to identify any open-ended steelwork from the ground before gaining access at height.

6 COMMENT

6.1 It is an employer's duty to ensure that any worker is competent to undertake the task(s) that they are required to undertake. This may mean having to undertake additional training – whether internal or external - over and about any IRATA qualification.

6.2 In terms of anchors, the ICOP states:

The anchor system is of primary importance in the rope access system and should be unquestionably reliable (Clause 2.11.2.1).

6.3 The term "unquestionably reliable" is not purely a reference to an anchor's strength requirement but incudes suitability, i.e. is it 'fit for purpose'.

6.4 The ICOP also states:

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. It is also essential that anchor devices are fitted, tested, inspected and used by competent persons and strictly in accordance with manufacturer's instructions (Clause 2.7.9.3).

6.5 Finally, the ICOP discusses beam clamps. Annex F, 'Safety considerations when installing or placing anchor devices for use in rope access', states:

Beam clamps should be securely clamped to the I-beam before use (Annex F, 3.9.3).

7 FURTHER INFORMATION

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition)[2]:

- Part 2, 2.7.9. Anchors
- Part 2, 2.11.2, The anchor system (anchors and anchor lines)
- Part 3, Annex F (informative), Safety considerations when installing or placing anchor devices for use in rope access
- Part 3, Annex L: Other harness-based work at height access methods

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

8 RECORD FORM

8.1 An example *Safety Bulletin: Record Form* is given below. Members may have their own procedure(s) for recording briefings to technicians and others.

2 https://irata.org/downloads/2055

IRATA SAFETY BULLETIN – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Safety Bulletin No. 45: Fall from height: Aid climbing	
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:					

SAFETY BULLETIN NO. 46:
FALL FROM HEIGHT – MAJOR INJURY

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of use as part of a toolbox talk.

DISCLAIMER:

*This safety bulletin - including, where given, any conclusions - is not as a result of any investigation undertaken by IRATA. It is based on information provided by a **non-member** company. IRATA does not attribute any blame; nor provide opinion on any root causes. Neither is any opinion expressed or implied on liability or culpability. The following summary is provided to assist others in applying any 'lessons learnt'. Rope access is defined in the IRATA ICOP, Part 1, 1.3, Definitions. In essence, it is a two-rope system (working line and safety line). For the purposes of this summary, any reference to 'on-rope' or 'off-rope' should be construed accordingly.*

1 INTRODUCTION

1.1 This safety bulletin summarises the findings of a fall from height accident which occurred during work to clean the external windows at an office building. The fall resulted in significant injuries.

2 BACKGROUND INFORMATION

2.1 Date of incident: June 2016.

2.2 Injured person: IRATA-qualified Level 1 rope access technician.

3 WHAT WENT WRONG

3.1 A rope access technician was about to start a descent to clean the external windows at an office building. The technician was qualified to IRATA Level 1, working for a non-member company, and had been to the site many times. He had over 30 months experience of working on ropes and was looking to move up to become a Level 2 in the near future.

3.2 The technician's colleagues and supervisors all regarded him as being competent on the ropes and had no concerns about his abilities.

3.3 The equipment and ropes being used were almost brand new.

3.4 The job had a risk assessment and method statement in place and Level 3 supervisors were on site and involved in the work. The building manager had also agreed with the contractor which anchor points were to be used.

3.5 Unfortunately, after having already completed several drops during the morning something went wrong as he began his descent and the rope access technician subsequently fell two storeys.

3.6 The injured technician suffered significant injuries to both of his legs, requiring several operations. He has since made a good recovery.

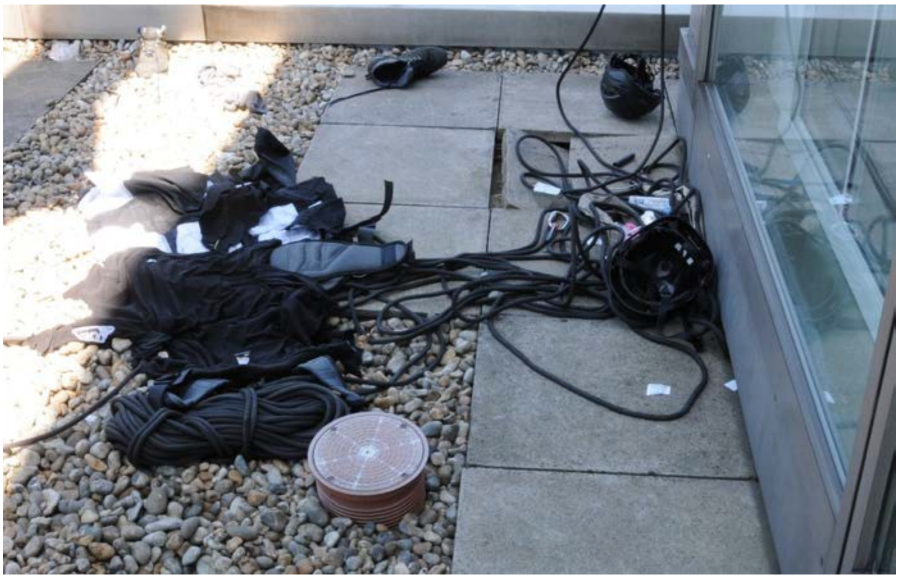

Photo 1:
Broken slab where injured person landed during fall

4 WHY IT WENT WRONG

4.1 The subsequent investigation by the employer, and local enforcing authority, failed to determine an exact cause for the fall. However, several underlying issues were identified.

4.2 On the face of it, the task was a safe one. The equipment was in good condition, the technician met best practice training and qualifications for his work, supervision was in place and all parties involved had agreed that the risk assessment and method statement were suitable and sufficient.

4.3 In the opinion of the local enforcing authority, the likeliest contributory factor to the accident was equipment selection and, in particular, the choice of descender and back-up device. The likelihood that both items of equipment failed and/or were misused simultaneously is considered very low. Nonetheless, an accident occurred.

4.4 Importantly, the equipment used by the injured technician had been replaced only a few months prior to the accident. Neither the descender nor back-up devices being used at the time of the accident were those on which he had been trained and had experience in.

5 EQUIPMENT SELECTION

5.1 To help achieve a safe rope access system, proper equipment selection is essential.

5.2 For descenders, the IRATA International code of practice for industrial rope access (ICOP), Clause 2.7.5.2, states:

“When selecting a descending device, it is essential that the probability of foreseeable misuse and the consequences of such misuse are assessed. When such an assessment has been made, a residual risk of misuse may exist, which should be addressed by identifying and applying specific control measures, such as the selection of alternative equipment, extra training, modification of work practices, increased supervision or a combination of these.”

5.3 Furthermore, Clause 2.7.5.4 recommends a number of selection criteria, including:

“a) be selected such that the anticipated loading is appropriate for the mass of the rope access technician, including any equipment worn, i.e. in accordance with the manufacturer’s maximum and minimum rated loads;

f) automatically stop the descent if the rope access technician loses control, i.e. lock automatically in the hands-free mode (noting that it is common and acceptable for some minor creep of the descending device along the anchor line to occur);

g) preferably fail to safe in all modes of operation, e.g. stop the descent automatically when gripped too tightly in panic (panic locking)”.

5.4 For back-up devices, the ICOP (Clause 2.7.7.5), states:

“When selecting a back-up device, it is essential that the probability of foreseeable misuse and the consequences of such misuse are assessed. When such an assessment has been made, a residual risk of misuse may exist, which should be addressed by identifying and applying specific control measures, such as the selection of alternative equipment, extra training, modification of work practices, increased supervision or a combination of these”.

5.5 Furthermore, Clause 2.7.7.7 recommends a number of selection criteria, including:

“a) that the anticipated loading is appropriate for the mass of the rope access technician including any equipment worn, i.e. in accordance with the manufacturer’s maximum rated load;

b) the suitability with regard to arresting the mass of the user, including any equipment worn or carried;

j) minimal manipulation required by the rope access technician;

k) preferably fail to safe in all modes of operation, e.g. prevent or arrest a fall even when gripped in panic”.

6 DISCUSSION

6.1 The descender did not have a fail to safe mode. The device is primarily designed for experienced rope access technicians.

NOTE: Some descenders have a feature that means that rope cannot be threaded incorrectly.

6.2 The back-up device was of a type that required towing and can be considered susceptible to failure if grabbed.

6.3 The injured technician was trained to IRATA Level 1, but had no formal training in the devices being used. The consequences of changing equipment had not been considered.

6.4 On the assumption that either item of equipment had been inadvertently rigged incorrectly, this was not identified through ‘buddy checking’ (see ICOP, Clause 2.11.7.4). These are an important opportunity for mistakes or equipment faults to be identified and rectified prior to any work commencing.

7 REMEDIAL ACTIONS

7.1 A number of changes were made to working practices:

7.2 **Equipment section:**

A 'foreseeable misuse risk assessment' was introduced. This looks at all the equipment in use and examines the consequences of it failing, or being misused, both in isolation and in conjunction with other items. The review reinforced the importance of selecting equipment that fails to safe and/or which requires minimal user intervention.

7.3 **Back-up device:**

It was concluded that a back-up device should be just that; a back-up device. Where other functions are required they should be provided as additional items of equipment, rather than attempting to solve the problem with one item only.

7.4 **Risk assessments:**

These were improved include clear details of the anchor points to be used on each façade. Additionally, photographs and descriptions of each drop were included (by the supervisor) as well as a note of any access issues.

7.5 **Training:**

The Level 3 rope access technicians have undertaken safety training for managers and 'signed off' as Level 3 rope access safety supervisors.

7.6 **Monitoring:**

Small cameras were introduced as a means of enabling the company to monitor (remotely, from a place of safety, and retrospectively) work undertaken by technicians in 'hard to access' areas remotely.

NOTE: The technicians were consulted on their introduction and have been supportive. It also enables them to prove that they are working safely and demonstrate the same to building and facilities managers. Such means should allow them to show that buddy checks have been taking place at the frequency the company desires.

7.7 **Lessons learnt:**

The company directors are taking the 'lessons learnt' into other aspects of their business and are actively seeking IRATA membership (with the auditing, etc. that this entails).

8 FURTHER INFORMATION

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition)[1]:

- Part 2, 2.7.5, Descending devices
- Part 2, 2.7.7, Back-up device
- Part 2, 2.11.7, Pre-work checking

(b) IRATA International Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (V004, 24/12/2019)[2]:

- 6.3.1, Selection of equipment

1 https://irata.org/downloads/2055
2 https://irata.org/downloads/2059

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

9 RECORD FORM

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

IRATA SAFETY BULLETIN – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Safety Bulletin No. 46: Fall from height – major injury	
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:			

SAFETY BULLETIN NO. 47:
WORKING IN A BUNKER – DANGEROUS OCCURRENCE

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of use as part of a toolbox talk.

DISCLAIMER:

This safety bulletin - including, where given, any conclusions - is not as a result of any investigation undertaken by IRATA. It is based on information provided by a member company. IRATA does not attribute any blame; nor provide opinion on any root causes. Neither is any opinion expressed or implied on liability or culpability. The following summary is provided to assist others in applying any 'lessons learnt'. Rope access is defined in the IRATA ICOP, Part 1, 1.3, Definitions. In essence, it is a two-rope system (working line and safety line). For the purposes of this summary, any reference to 'on-rope' or 'off-rope' should be construed accordingly.

1 INTRODUCTION

1.1 This safety bulletin summarises a dangerous occurrence that took place whilst rope access technicians were cleaning the internal walls of a limestone bunker.

2 BACKGROUND INFORMATION

2.1 Date of incident: February 2017.

2.2 Injured persons: None.

3 WHAT WENT WRONG

3.1 Rope access technicians were cleaning the internal walls of a bunker containing limestone, using high impact percussive hammers ('kango').

3.2 The work commenced on the south face. Whilst this was being undertaken material from the north side slid downwards.

3.3 Due to the viscosity of the material, two Level 2 rope access technicians were trapped up to and including their waist.

3.4 The L3 immediately raised the site alarm and the on-site emergency services were deployed to assist with the retrieval/rescue of the technicians.

3.5 The technicians were retrieved/rescued without injury and taken to a local hospital for a check-up; and discharged without injury. They all returned to work the following day.

4 REMEDIAL ACTIONS

4.1 To prevent a recurrence the method statement was changed:

4.2 On the north elevation the rope access technicians, using high impact percussive hammers, cleared away the compacted limestone to a depth no greater than 1 metre from the top of the hopper.

4.3 Moving themselves to the east elevation the same process was followed, only removing a maximum of 1 metre of debris at a time. This was repeated sequentially, moving clockwise.

4.4 Once enough material had been removed and built up in the bottom of the hopper the technicians removed themselves from the hopper and draw all their ropes up onto the access platform surrounding the hopper.

4.5 The Level 3 then removed the lock-out isolation, as directed by the client, to allow the transfer of the materials from the bottom of the hopper.

4.6 These steps were repeated so that all technicians were out of the hopper until material had been removed.

5 DISCUSSION

5.1 Steps should be taken, where necessary to prevent danger to any person, to ensure that any material does not collapse or become unstable, i.e. be in a temporary state of weakness or instability.

5.2 Consideration should be given to the placing of any excess anchor line for the descent in a bag and suspending it beneath the rope access technician. This can prevent anchor lines from becoming entangled or damaged by any falling debris, e.g. when removing rock during slope stabilisation (ICOP, Clause 2.11.3).

5.3 Care is necessary to remove loose material before descending and it is important to be aware of the possibility that any movement of the anchor line could dislodge material above, which could fall onto the rope access technician (ICOP, Clause 2.11.3).

6 FURTHER INFORMATION

6.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition)[1]:

- Part 2, 2.11.3, Use of anchor lines

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

7 RECORD FORM

7.1 An example *Safety Bulletin: Record Form* is given below. Members may have their own procedure(s) for recording briefings to technicians and others.

1 https://irata.org/downloads/2055

IRATA SAFETY BULLETIN – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Safety Bulletin No. 47: Working in a bunker – dangerous occurrence	
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:			

A safety bulletin prepared by © IRATA International (2018)

SAFETY BULLETIN NO. 48: USE OF A TELEHANDLER AS AN ANCHOR

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of use as part of a toolbox talk.

DISCLAIMER:

This safety bulletin - including, where given, any conclusions - is not as a result of any investigation undertaken by IRATA. It is based on information provided by a member company. IRATA does not attribute any blame; nor provide opinion on any root causes. Neither is any opinion expressed or implied on liability or culpability. The following summary is provided to assist others in applying any 'lessons learnt'. Rope access is defined in the IRATA ICOP, Part 1, 1.3, Definitions. In essence, it is a two-rope system (working line and safety line). For the purposes of this summary, any reference to 'on-rope' or 'off-rope' should be construed accordingly.

1 INTRODUCTION

1.1 A dangerous occurrence took place when ropes were rigged to the forks of a telehandler that had not been immobilized. The telehandler was driven a short distance, to move a compressor, but fortunately no rope access technician was injured.

2 BACKGROUND INFORMATION

2.1 Date of incident: September 2017.

2.2 Injured persons: None.

2.3 Two Level 1 rope access technicians had rigged two sets of ropes to a telehandler. This was checked by the Level 3 supervisor. The technicians were attached to the rigged ropes and had descended the cutting to mark up the rock surface for drilling, as part of some geotechnical works. At the time of rigging the telehandler was locked, no key was present and the driver was away in the site compound.

3 WHAT WENT WRONG

3.1 At approximately 03:20hrs the telehandler driver was contacted to go and reverse the telehandler to attach a compressor. The Level 3 heard the telehandler's reversing beacon and immediately alerted the banksman and driver to stop.

3.2 The telehandler had moved approximately 1m before being told to stop and, as a result, the two rope access technicians attached to the telehandler were pulled upwards.

3.3 One of the rope access technicians was stood near the top of the cutting and was moved a couple of steps upwards. The other technician was situated down the cutting face closer to its base, a short distance above the rail line. He was pulled approximately 0.5m upwards. Once the telehandler was stopped, the rope access technician at the bottom of the cutting descended to the ground and detached from the ropes. The other rope access technician was at the top of the cutting. He walked upwards to the top and detached from the ropes.

3.4 The works were stopped, made safe and a team meeting convened for a site debrief. No treatment was needed as no injury occurred.

4 WHY IT WENT WRONG

4.1 The work had been planned so that the rope access technicians were rigged from their own vehicle (from the road and under traffic management). In this location, due to the position of the parked telehandler, this was not possible.

4.2 The risk assessment and method statements (RAMS) did not state rigging to a third party's vehicle as a method of anchorage. Head office was not informed that the Level 3 on site had changed the documented and agreed method of rigging.

4.3 The Level 3 when deciding to change the method of anchorage did not perform and document changes to the planned method of work.

4.4 The Level 3 did not inform the banksman or telehandler driver before rigging ropes to the telehandler. Neither did he inform any members of the principal contractor's staff.

5 EQUIPMENT

5.1 The banksman and telehandler driver did not perform a 360 degree check of the vehicle before it being moved. If the driver and banksman had performed the correct pre-start vehicle checks before moving the telehandler they would have seen the ropes rigged and no incident would have occurred.

6 DISCUSSION

6.1 This was a high potential near hit. Fortunately, no one was injured. There was certainly a breakdown in communication between the Level 3 and the banksman and driver, both when the ropes were rigged initially and when they arrived at the machine to move it. The correct vehicle pre-use checks were not carried out.

6.2 The procedures set out were not followed by the Level 3 when changing methodology. Change control is an important consideration within a company's processes.

6.3 Vehicles and mobile site machinery of various types can make effective anchors. The vehicle must have sufficient mass and frictional resistance to the ground to provide an unquestionably reliable anchorage for both the working line and the safety line. There should be appropriate attachment points for the anchor lines.

6.4 There should be no possibility that the vehicle engine could be started or that the vehicle(s) could be moved, e.g. by being pushed or by being impacted by another vehicle. Correct isolation of the vehicle(s) should be ensured. Wheel chocking may be necessary. Barricading should be provided to make the vehicle(s) part of an exclusion zone. Signs warning of the dangers of unauthorized movement should be considered. A sentry may be required.

7 REMEDIAL ACTIONS

7.1 The Level 3 supervisor was removed from supervisory duty on this job and issued with a written letter of warning.

7.2 The procedures and RAMS were amended to describe the safe method of work when rigging to vehicles. The member company had not given permission, nor included a safe method of work for rigging from a vehicle.

7.3 A 'learning bulletin' was prepared and disseminated.

7.4 A tool box talk was given to all rope access technicians to brief them on the correct procedures when using vehicles as anchors. All technicians were required to sign to confirm their understanding.

8 FURTHER INFORMATION

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition)[1]:

- Part 3, Annex F, Safety considerations when installing or placing anchor devices for use in rope access (Clause F.3.6)

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

9 RECORD FORM

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

1 https://irata.org/downloads/2055

IRATA SAFETY BULLETIN – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Safety Bulletin No. 48: Use of a telehandler as an anchor	
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:					

SAFETY BULLETIN NO. 49:
POWERED ASCENDERS: THE HAZARDS

A safety bulletin aimed at raising awareness of hazards in the rope access industry. The text may be of use as part of a toolbox talk.

DISCLAIMER:

This safety bulletin - including, where given, any conclusions - is not as a result of any investigation undertaken by IRATA. The case study is based on information provided by a member company. IRATA does not attribute any blame; nor provide opinion on any root causes. Neither is any opinion expressed or implied on liability or culpability. The advice given is general in nature and provided to assist others in their use of powered ascenders.

1 INTRODUCTION

1.1 There have been a number of incidents reported following the use of powered ascenders.

1.2 The recommendations made in the IRATA ICOP do not cover powered ascenders, e.g. powered by battery or petrol, although it is noted that, "… the principles that apply to the safe use of manually-operated descending devices are likely to apply also to powered versions" (**2.7.5**).

1.3 This safety bulletin is designed to give general advice about the hazards associated with the use of powered ascenders. The information supplied by the manufacturer should be consulted.

1.4 It is essential that the probability of foreseeable misuse and the consequences of such misuse are assessed. When such an assessment has been made, a residual risk of misuse may exist, which should be addressed by identifying and applying specific control measures, such as the selection of alternative equipment, extra training, modification of work practices, increased supervision or a combination of these.

Case study
A rope access company undertook a contract carrying out repair work within a deep shaft. Due to the restricted nature of the worksite operatives needed to be clear of the shaft when lifting and lowering equipment and materials. To improve safety and work efficiency, a powered ascender was rigged from a gantry on the surface with the capability of being operated remotely by operatives within the shaft (when required). The work within the shaft itself created dirt and grit. This contaminated the working lines resulting in accelerated wear of the powered ascender. This caused a sharp edge to form on the device, resulting in extensive damage to a rope during an ascent controlled remotely by an operative. No failure of the rope occurred. However, the rope sheath was completely cut through and the core damaged.

2 WHAT IS A POWERED ASCENDER?

2.1 A powered ascender is an item of equipment that allows a technician to ascend or descend a rope by mechanical means, thereby reducing the physical effort required to ascend. The device may be electrical or fuel-powered and should be used as part of a two rope system.

2.2 Ascenders offer various options for the method of ascent, relationship to the user (e.g. mounting) and secondary uses (e.g. lifting, hauling and tensioning).

3 WHAT ARE POWERED ASCENDERS USED FOR?

3.1 Powered ascenders have many uses. These include assisting in jobs that require:

- numerous ascents (both vertical and diagonal);
- long ascents;
- multi-user ascents;
- controlled descents;
- the transport and use of materials;
- the lifting and lowering of an operative by mechanical means;
- rescue provision (including rig-to-rescue).

4 TYPES OF POWERED ASCENDER AVAILABLE

4.1 There are many different types of powered ascender on the market, offering different means of interaction with the end user:

(a) Seat type

The user sits on a suspended seat and operates the device to ascend and descend. The operative still wears a harness, but the seat supports the user, so the user is not directly suspended in their harness.

(b) Suspended type

The user connects their harness directly to an anchor point on the device, sitting in their harness suspended below the device.

(c) Fixed type

The device is anchored at a location and controls the rope rigged via a pulley, with the user attached to the rope.

(d) Dual (multi) type

A device that can be deployed in different configurations, e.g. (a), (b) and (c); (b) and (c).

4.2 Some powered ascenders can be set up as a hauling device. The rope passes through the device and the device is anchored separately from the user. This allows the user to be raised or lowered remotely.

4.3 Operating powered ascenders can differ between model and type. Some can be, for example, operated directly via a throttle or push-button. Others can be operated remotely.

5 HOW DO POWERED ASCENDERS WORK?

5.1 The design of powered ascenders differs between manufacturers. In essence, however, they all share the following elements:

(a) Power source (e.g. DC battery, AC power or fuel)

This drives a motor or engine that is controlled by the user. The motor or engine operates through a gear box in order to control the output speed of a driven pulley or winch.

(b) Drive

The interaction between the rope and the drive pulley or winch is a key focal point for the compatibility of powered ascenders and rope. This also affects the rope care and lifespan. Some units have a small contact surface area which generates a lot of heat and wear on the rope, some have larger contact areas or can be adjusted.

(c) Control panel

This controls the speed of ascent and descent. There may be variable or single speed control. Some devices also offer remote control. Descent of the units also varies. Some devices have powered descent whilst others rely on friction (in a similar way to a manual descender).

5.2 Different products offer different specifications and capabilities in respect of range, speed (ascent and descent) and load capacity. The setup and maintenance requirements differ between devices, as does the product certification. Therefore, safety considerations for operational use also differ. All devices include direct attachment of the user, via a karabiner or sling, to ensure they are connected to the primary anchor line.

6 WHAT ARE THE BENEFITS OF USING POWERED ASCENDERS?

6.1 The benefits of using powered ascenders include (depending upon the device):

- a reduction in climber fatigue through assisted ascent (the unit does the work);
- a faster speed of ascent, i.e. there is a saving in operational time;
- improved technician positioning thus reducing stress on body and fatigue;
- capacity for two-person loading;
- multi-role capability, reducing logistical and equipment costs;
- a reduced operational footprint on sites compared to cranes and other powered access.

7 TYPICAL SIGNIFICANT HAZARDS AND CONTROL MEASURES

7.1 There are a number of typical significant hazards and control measures to be considered when using powered ascenders (see Table 1):

<u>**NOTE:**</u>

This list should not be considered exhaustive and should only be considered as the starting point of reference for undertaking a comprehensive risk assessment.

Table 1: Typical hazards and control measures

Hazard	Risk	Example control measure(s)
1. **Incorrectly loading the rope into the powered ascender.**	Fall from height and/or uncontrolled descent. There may be sufficient friction for the device to maintain its position but then drop when loaded, resulting in impact or an uncontrolled descent.	Follow the manufacturer's guidance and instructions when loading the rope into the device. Most devices are single setup and cannot be operated incorrectly. Technicians should be competent in the use of the device being used (to include adequate training). Always undertake pre-use checks before a device is used. Before carrying out a full functional check, ensure that stopper knots and/or lock off devices are placed on the rope to prevent an uncontrolled descent
2. **Wear on part(s) of the device; or the device itself causing damage to the rope.**	Damage to the rope. Rope failure, resulting in an uncontrolled descent and/or impact.	Technicians should be competent in the use of the device being used. Carry out daily inspections and pre-use checks before using equipment. Before use, ensure that any guards and protection measures are in place and functioning correctly. If required, wear suitable protective gloves. Wear suitable protective clothing. Keep all items clear of the device/mechanism as these have the potential to be drawn in. Technicians should be competent in the use of the device being used.

3. **Technician being struck whilst in suspension and with the powered ascender suspended from their harness/back- up device.**	Main line rope failure resulting in the 'casualty' and powered ascender being suspended on their backup device. Personal injury by being struck by the powered ascender. Additional impact on the body through dynamic loading from of unit falling past the technician. Increased static mass suspended on the casualty's harness.	Ropes must be rigged and protected in accordance with the IRATA ICOP, **Annex P** (and the hierarchy of edge protection). Ensure the correct selection of back-up device. The rescue plan must take into account any additional risk posed by the potential for an additional mass to be suspended from the casualty. The method of work should protect the user from being struck and injured by the equipment in the event of a rope failure. Consider the use of a separate back-up system for the device. Ensure appropriate personal protective equipment, e.g. helmet. Use the connector recommended/provided by manufacturer between the device and the user's harness. Technicians should be competent in the use of the device being used.
4. **Rope being drawn through the device.**	Fingers, gloves or clothing being drawn into the device. Personal injury.	Follow the manufacturer's guidance and instructions when using the device. Alternative methods of use must be approved by the manufacturer. Always undertake daily inspections and pre-use checks before a device is used. Before use, ensure that any guards and protection measures are in place and functioning correctly If required, wear suitable protective gloves. Wear suitable protective clothing. Keep items clear of the device's mechanism, to avoid them being drawn in. Technicians should be competent in the use of the device being used.

5. **Snagging the load (item or person) during ascent or descent.**	Personal injury. Damage to structures or property. Dropped objects.	Follow the manufacturer's guidance and instructions when using the device. Alternative methods of use must be approved by the manufacturer. During ascent and descent, keep items clear of any potential snagging points. Ensure good visibility and awareness during ascent and descent. Maintain a controlled ascent and descent at all times. If using device(s) for remote lifting and/or lowering operations ensure that control is maintained. The user should remain vigilant to prevent continued ascent/descent in the event of snagging. Technicians should be competent in the use of the device being used. Ensure that any user instructions and/or manual are read and present on job.
6. **Incorrect rope selection.**	Rope damage to anchor line. Uncontrolled descent.	Follow the manufacturer's guidance and instruction on the selection and use of rope. NOTE: In some instances the manufacturer recommends that the rope is pre-conditioned in cold water and thoroughly dried, before first use.
7. **Incorrect use by untrained incompetent technician.**	Uncontrolled descent.	Technicians should be competent in the use of the device being used. Follow the manufacturer's guidance and instructions when using the device. Alternative methods of use must be approved by the manufacturer.
8. **Additional mass.**	The anchor and/or device strengths may be exceeded. Additional complications to rescue procedure. Manual handling.	Ensure that all anchors and devices are suitable for any additional mass of equipment. NOTE: Some powered ascenders are in excess of 20kg. Ensure that all rescue plans take into account the additional mass of the device. See guidance in IRATA ICOP **Part 3** and **Annex M.4**, Bulky, awkward or heavy equipment. Work in accordance with any local manual handling legislative requirements.

9. **Fuel type.**	Flammable liquids and hazardous substances.	Carry out any assessment on any hazardous substance(s), as required, and follow the recommendations in any material data safety sheet(s). Ensure the correct fuel type. Fuelling areas and spill kits to be available, as required. Fuel level checks and fuel availability. To avoid fire risk while refuelling, refuel only when components are cool and have fire suppression equipment available.

8 SOURCES OF INFORMATION

8.1 Sources of information include the following manufacturer's instructions:

Harken

https://www.harkenindustrial.com/en/home/

https://www.harkenindustrial.com/en/harkenindustrialcom/powerseat-ascenders/

ActSafe

http://www.actsafe.se/

http://www.actsafe.se/file_uploads/actsafe%20safety%20notice%2020141202%20djs.pdf

Ronin

https://roninpowerascender.com/

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

9 RECORD FORM

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

IRATA SAFETY BULLETIN – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Safety Bulletin No. 49: Powered ascenders: the hazards (002)	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 1: INSPECTION OF EQUIPMENT

A safety and health topic sheet aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Inspection of work equipment plays a vital role in protecting the safety of the technicians who use it.

1.2 It is important in ensuring the continued safety of those using life supporting equipment. Correct and thorough inspection also ensures that organisations are compliant and not left open to litigation.

1.3 There should never be any doubt about the continued serviceability of an item of equipment. If necessary, the matter should be referred to a competent person or the equipment should be quarantined or disposed of.

Case study
Defects can go undetected. Be aware that damage can build up slowly and may not be readily perceptible. **Incorrect threading by manufacturer of a buckle** ○ Check all buckles are threaded as described in manufacturer's instructions, even before first use. **Damaged or contaminated quick release buckle mechanisms** ○ Clean and lubricate buckle mechanisms as described in manufacturer's instructions. **Twistlock karabiner not closing fully** ○ Function check all gate mechanisms to ensure locking systems engage correctly. **Excessive wear on harness webbing behind D-ring** ○ Pay attention to areas of high wear. *IRATA Safety Bulletin 23: Safety Alert - Pre-use checking of equipment. 29 June 2012*

2 WHAT CAN GO WRONG …

2.1 Equipment can fail. Without training in inspection, and inspection and maintenance procedures, items of equipment can have faults that remain undetected for pro-longed periods of time. This may result in an increased risk of injury or harm to technicians, plant and/or equipment.

2.2 Despite inspection and maintenance procedures, technicians should remain vigilant through pre-use checks (often referred to as "buddy checks") and conduct pre-use function tests for all load-bearing equipment before using it. In addition, ongoing monitoring is required to detect damage that may have occurred during use.

2.3 Equipment should be used within its scope of intended use, as outlined by the manufacturer. Otherwise, damage may result.

2.4 Equipment that has not been inspected by a competent person can result in injury or harm.

Case study
A karabiner failed because it was used with the gate in the unlocked position. The most likely cause of the karabiner being unlocked was dirt inside the gate mechanism, preventing it from closing fully. The karabiner was not rigorously checked for security when it was operated. The planned maintenance system had not identified the karabiner on the manriding harness as an inspection item. *IRATA Safety Bulletin 14: Manriding incident – Connector Failure. 26 October 2010*

3 WHY THINGS CAN GO WRONG …

3.1 Things can go wrong when procedures are not in place, are incomplete or are not followed. The opportunity is missed to identify actual or potential defects. Complacency can also result in defects being overlooked.

Case study
During rescue training a descender, threaded correctly, was not correctly closed. This resulted in both the rescuer and the casualty being suspended on the rescuer's back-up device. The spring catch on the side plate had not been closed correctly. It is important to undertake a pre-use check of equipment (visual, tactile and functional). *IRATA Safety Bulletin 12: Descender near-miss – Failed to check side plate catch. 23 December 2009*

4 WHAT YOU CAN DO …

4.1 Equipment inspections generally fall into three categories:

- pre-use check;
- detailed ('thorough') inspection; and
- interim inspection.

4.2 The manufacturer of equipment is required to supply product information. This information should be read and understood by the user, before using the equipment. Changes are made to specifications, so this also applies to replacement equipment.

4.3 Knowledge of the strengths and weaknesses of equipment can help to avoid misuse. Technical brochures, the manufacturer's website, catalogues, etc. often provide further detail.

In Europe, personal fall protection systems must be supplied with manufacturer's instructions, which include instructions for periodic examination, that comply with EN 365. This requires that the instructions for periodic examination shall include: *"Where deemed necessary by the manufacturer, e.g. due to the complexity or innovation of the equipment, or where safety critical knowledge is needed in the dismantling, reassembly or assessment of the equipment (e.g. a retractable fall arrester), an instruction specifying that periodic examinations shall only be conducted by a person or organization authorized by the manufacturer".* IRATA Safety Bulletin 2: Safety Alert – Periodic examination of fall protection equipment. 28 August 2008

5 HOW YOU CAN DO IT …

5.1 **Pre-use check:** These must be carried out by rope access technicians on their own equipment before first use each day. It is advisable to monitor the condition of equipment through the duration of the task, to ensure no damage or intervention has prevented equipment or systems from functioning correctly.

5.2 **Detailed ('thorough') inspections:** These are formal inspections and they must be carried out:

- before first use;
- upon receiving an item from a third party;
- every 6 months (or at intervals specified in an inspection scheme drawn up by a competent person).

5.3 **Interim inspections:** These should be carried out where a risk assessment has identified the potential for high wear and tear or other dangers in the period between detailed inspections, e.g. following an incident, use in a hazardous environment, potential overload, etc.

5.4 It is essential that the person carrying out a detailed or interim inspection has the authority to dispose of equipment and is sufficiently competent, independent and impartial to allow objective decisions to be made. This person may exist within your rope access company, or could be a specialist supplier, manufacturer or a specialist repair organisation. Your company should detail its arrangements for nominating the competent person(s) in its management system.

5.5 Any item showing signs of defect or alteration - without the approval of the manufacturer - should be withdrawn from service immediately and quarantined (pending an inspection).

6 ACTION

6.1 Review your management system's procedures for the inspection of equipment.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:

Part 2, 2.7, Selection of Equipment

Part 2, 2.10, Inspection, care and maintenance of equipment

- 2.10.1.4.1, Pre-use check
- 2.10.1.4.2, Detailed inspection
- 2.10.1.4.3, Interim inspection

[1] https://irata.org/downloads/2055

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (v005, 20/05/2021)[2]

- 6.3, Equipment
- 6.3.3, Pre-use checking of equipment
- 6.3.4, Detailed and interim inspections

7.2 For a list of current (and past) safety communications by IRATA, see www.irata.org

8 RECORD FORM

8.1 An example *Safety and Health Topic Sheet: Record Form* is appended.

8.2 Members may have their own procedure(s) for recording briefings to technicians and others.

9 FURTHER READING

9.1 IRATA International, Code of practice for industrial rope access, Part 3, Annex H, Equipment inspection checklist[3]

9.2 BS EN 365:2004, Personal protective equipment against falls from a height. General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging

2 https://irata.org/downloads/2059
3 https://irata.org/downloads/2055

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 1: Inspection of equipment	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 2: NEAR MISSES: LEARNING FROM FAILURE

A safety and health topic sheet aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Human failure is as important as a rigging or mechanical failure. There are numerous causes of falls from a height which result from human failure. These include: poor communication, complacency, over confidence and lack of knowledge.

1.2 Within the rope access industry, many have had ‘moments of stupidity’; unwitnessed near misses that might have resulted in a consequence greater than an increased heartrate and a sudden realisation of your own mortality.

1.3 It might have been a forgotten leg-loop, a karabiner clipped back to a ‘cowstail’ rather than an anchor point, descenders threaded up-side-down, a karabiner misconnection, etc. All these occurrences are considered to be near misses.

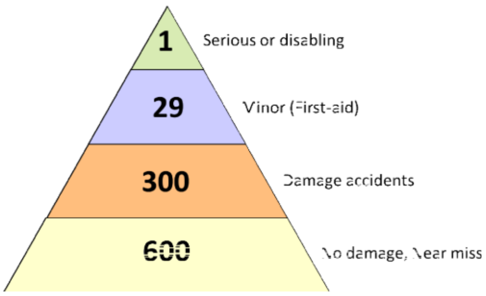
1.4 It is important to report them to your company! Without this, they don’t become a learning experience for others.

LEARN LESSONS FROM OTHERS.
HOWEVER, YOU CAN ONLY DO THIS IF THEY REPORT THEM!

2 WHAT CAN GO WRONG …

2.1 An unreported near miss, e.g. a small fall from height, may at some point result in an injury or fatality elsewhere.

2.2 One theory[1] tells us that for a large number of ‘No damage, Near miss’ events there will be a smaller number of ‘damage accidents’ and – ultimately – a ‘serious or disabling’ event, e.g. a fatality.



[1] Frank E. Bird, Jr (1921 – 2007)

2.3 Accordingly, one way to help prevent the more serious incidents is to report the near misses. It might then be possible to identify a pattern in the types of incidences, which could lead to a way to prevent them.

2.4 Nobody wants to report a foolish mistake; nor ought they take a conscious risk without consequence to save time or effort. However, near miss information can be used to make changes, prevent accidents and save lives.

Case study
Description Technicians carrying out window cleaning did not have enough rope to reach the ground on a long drop. They asked other technicians to re-rig the ropes to reach the floor whilst they waited in a position of safety. Using mobile phones to communicate, they waited until the rigging technicians had finished moving the ropes and gave the all-clear to continue.
Causes Unsuitable rigging as the ropes could have been rigged to reach the floor, removing the necessity to re-rig during operations. There was a lapse in judgment in not checking that the ropes reached the floor before starting work.

3 WHY THINGS CAN GO WRONG …

3.1 Things can go wrong for many reasons:

- There may be a lapse of judgment.
- Someone may decide to cut a corner.
- A near miss may not be reported.
- There may be poor supervision.
- A technician may lack experience or knowledge.
- Someone may be overconfident.
- Communication may be poor.
- There may be a false sense of safety.
- Procedures may be ineffective or inefficient.
- There may be a ‘blame culture’.

4 WHAT YOU CAN DO AND HOW YOU CAN DO IT …

4.1 You should always:

- Take time to assess what is going on. You’re less likely to have a lapse in judgement when tasks are thought through properly.
- Allow adequate time to complete tasks. Don’t encourage rushing.
- Encourage near miss reporting (If necessary, reporting can be anonymous). You can ‘learn from failure’

- Ensure good standards of supervision. There should be sufficient number of manager(s) and/or supervisor(s).
- Use the correct people for the task. Protect and teach those who are inexperienced.
- Make sure that technicians are aware of the risks and the potential severity of an incident. Training and information is vital.
- Ensure that communication is suitable and sufficient. Assess each task separately and ask yourself, "What's different today?"
- Ensure that procedures are kept under review. Work methods evolve and improve; make use of the most efficient and effective methods available.
- Encourage a "no blame culture". Where possible, ensure that technicians learn from their mistakes (rather than being punished for them).

5 ADDITIONAL CONSIDERATIONS …

5.1 Encourage technicians to report and discuss near misses and experiences that they have encountered or heard about.

5.2 Utilise toolbox talks or task assessment briefings. Vary the topics and encourage participation from all those involved.

5.3 In many cases, discussing these 'topic sheets' will be a good *aide memoire* in helping to prevent incidents.

6 ACTION

6.1 Review your management system's procedures for 'near misses'.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third Edition, September 2016)[2]:

- Part 1, 1.4.2.2, Training and competence
- Part 1, 1.4.2.3, Management and supervision
- Part 2, 2.2.6, Procedures and personnel to be in place before work begins
- Part 2, 2.2.6.2, Personnel
- Part 2, 2.3, Selection of rope access technicians
- Part 2, 2.3.2, Experience, attitude and aptitude
- Part 2, 2.4, Competence

7.2 For a list of current (and past) safety communications by IRATA, see www.irata.org

2 www.irata.org/downloads/2055

8 RECORD FORM

8.1 An example Safety and Health Topic Sheet: Record Form is appended.

8.2 Members may have their own procedure(s) for recording briefings to technicians and others.

9 FURTHER READING

9.1 Reducing error and influencing behaviour, HSG48 (HSE)[3]

9.2 Near miss reporting (HSE)[4]

9.3 Human factors: Behavioural safety approaches – an introduction (HSE)[5]

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3 www.hse.gov.uk/pubns/priced/hsg48.pdf

4 https://www.hse.gov.uk/pubns/near-miss-book.htm

5 www.hse.gov.uk/humanfactors/topics/behaviouralintor.htm

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 2: Near misses: Learning from failure	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 3: AVOIDING DROPPED BACK-UP DEVICES

A safety and health topic sheet aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Whether in an operational or training environment it is important to ensure that all back-up devices are used correctly and in accordance with the manufacturer's instructions.

1.2 Dropped objects are a significant area of concern to all working at height. Dropping a back-up device may put the user in a position where they are at risk of being on one point of attachment. A rescue may be required, or the technician may put others at risk.

2 WHAT CAN GO WRONG

2.1 Injury to others may occur as a result of a back-up device falling. It may strike equipment or a person, in or outside the exclusion zone.

2.2 Other members of the team may be put at risk assisting the technician who has dropped the back-up device.

Case study
Whilst removing their back-up device from the rope, a technician did not push the cam through the body to other side of the rope and replace the karabiner through the hole in the cam. The device was dropped subsequently.

3 WHY THINGS CAN GO WRONG …

3.1 There is always the potential for things to go wrong. This can include faulty equipment or operator error.

3.2 A technician may also use a device outside of the manufacturer's instructions. For example:

- A cam type device is removed from the device lanyard karabiner before it is attached to the rope and is dropped.
- A device that requires a short lanyard (cord) which is not attached to the karabiner enabling the back-up device to be dropped.
- Attaching the device to a lanyard not recommended by the manufacturer.

4 WHAT YOU CAN DO …

4.1 Technicians should be fully conversant with the operation of their back-up device.

4.2 Any company has a responsibility to provide 'familiarisation training' on all equipment. This is particularly important where new equipment is being used or the technician is an inexperienced Level 1 (e.g. equipment is being used that was not used during their initial training and assessment).

4.3 Training companies should train candidates on as many back-up devices as possible.

4.4 Always carry out a pre-use function check of the back-up device, before ascending or descending ropes.

5 HOW YOU CAN DO IT …

5.1 There are a large number of back-up devices available for use in rope access. When selecting any device, make an assessment of its susceptibility to being dropped.

5.2 Ensure that you:

- use devices in accordance with the manufacturer's instructions;
- comply with instruction and training;
- remain vigilant; and
- check the function before use.

6 ACTION

6.1 Review your management system's procedures for the selection of equipment, in particular back-up devices.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third Edition, September 2016)[1]:
  - Part 2, 2.7.1.6.3, Information supplied by the manufacturer
  - Part 2, 2.7.1.6.5, Accidental removal
  - Part 2, 2.7.1.7, Knowledge of equipment
  - Part 2, 2.7.7, Back-up devices
  - Part 2, 2.7.7.5, Probability of foreseeable misuse

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (v005, 20/05/2021)[2]
  - 6.6.2, Back-up devices

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

1 www.irata.org/downloads/2055
2 www.irata.org/downloads/2059

8 RECORD FORM

8.1 An example Safety and Health Topic Sheet: Record Form is appended.

8.2 Members may have their own procedure(s) for recording briefings to technicians and others.

9 FURTHER READING

9.1 EN 12841: 2006, Personal fall protection equipment. Rope access systems. Rope adjustment devices

9.2 Manufacturers' instructions - various

9.3 IRATA website, Publications, www.irata.org/publications

9.4 Industrial rope access - Investigation into items of personal protective equipment, Contract Research Report 364/2001, HSE, 2001[3]

9.5 Industrial rope access back-up devices: a review, The heightec Group Ltd., July 2013[4]

[3] https://www.hse.gov.uk/research/crr_pdf/2001/crr01364.pdf
[4] https://www.heightec.com/news/back-up-device-review-paper/

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 3: Avoiding dropped back-up devices	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 4: GEOTCHNICAL WORK

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Working on rock slopes using industrial rope access techniques presents a set of hazards not found in most industrial settings. These range from the integrity and use of various natural anchors, through to the stability of the ground underfoot and overhead.

2 WHAT CAN GO WRONG …

2.1 The work can be very physical and the conditions difficult as this type of work very often relies on the operatives maintaining stability without being in suspension, e.g. standing on muddy wet slippery slopes.

Case study
An operative working on a muddy slope slipped near to the top, landing heavily on his knee. As he was close to the top his ropes were running very low to the ground; and actually on the ground at the area closest to the anchor. Due to the injury, the operative was unable to stand and, as a result of the ropes being close to the ground, it was difficult to haul him back up. The operative was rescued and was aided back to the top. The position of the ropes on the slope made access for the rescue difficult and progress was slow.

3 WHY THINGS CAN GO WRONG …

3.1 Things can go wrong when the hazards have not been identified. Hazards include:

- **Slips trips and falls**
  Slopes can be very awkward to work on as rigging points are often low to the ground, making it difficult to stand comfortably early in the descent. Conditions are often wet, muddy and slippery.
- **Edge protection**
  There may be numerous points on the path of ropes where they are in contact with an edge. These must all be assessed and protected suitably.
- **Loose or falling objects**
  When ropes and technicians are in contact with the ground the potential for loose objects to be knocked is much higher. Technicians moving during tasks may dislodge objects above.
- **Rigging using natural anchors**
  Trees and rocks are often used as rigging points but should not be used unless assessed as unquestionably reliable by a competent person. Do not rely entirely on information provided by others, e.g. on anchor selection. If necessary, consult a geologist (for example).

- **Rescue difficulty**

  Although access and egress may be much simpler for a technician walking up and down a slope, manoeuvring and supporting the weight of a casualty in these situations is much more difficult, and must be considered.
- **Ropes become tangled or snagged**

  Ropes in contact with the ground, above or below the technician, require careful management.
- **Poor or incorrect equipment selection**

  Some equipment, e.g. descenders and back-up devices, are less effective when used on sloping ropes.
- **Working areas**

  Care must be given when setting out the working area, as the potential ‘fall out’ area for objects dropped on a slope is much larger than that normally excluded for works in suspension.

3.2 This list is not intended to be exhaustive.

4 WHAT YOU CAN DO …

4.1 Suitable control measure should be implemented. You should consider:

(i) alternative rigging options;

(ii) the selection of appropriate footwear;

(iii) the need for rope protection (and consideration of what is most appropriate);

(iv) attaching any rope protection to the hazard itself;

(v) surveying and clearing loose objects, in advance;

(vi) keeping all loads and ropes clear of the ground to prevent dislodging objects.

4.2 Again, this list is not intended to be exhaustive.

Case study
A technician on a geotechnical job was working below the level of some rock mesh. The ropes passed over a cable edge on the top of the rock mesh and the technician had attached two separate canvas rope protectors to the ropes at this point. Because the slope was not particularly steep the technician was able to work with little or no weight on the rope at times. When the task was complete the technician ascended back to the top. When they reached the protected edge both rope protectors had slid up the ropes and were no longer protecting the ropes. The working line, that had been weighted at times, had been severely abraded. The loading and unloading of the ropes, along with the technician’s movement during the task, had resulted in the rope protection ending up above the hazard, rendering it useless.

5 HOW YOU CAN DO IT …

5.1 Ensure that your risk assessment is site and task specific.

5.2 Think: “What might go wrong?” and “What’s different today?”

Case study
A two-technician team were installing anchors into a rock slope on two separate sets of ropes. One technician was drilling lower down the slope. The technician above was attaching tools and equipment to be lowered down to them. As the ‘top man’ lowered a bag of fixings to the technician below, the bag dragged through loose stone and earth. Some stones and mud were dislodged, falling onto the technician below. There was no injury. The system for passing down and retrieving tools and equipment from below was effective and simple, but did not take into account loose objects which could be dislodged.

6 ACTION

6.1 Review your management system’s procedures for geotechnical work, e.g. working on rock slopes.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September)[1]

- Part 2, 2.2.4, Risk assessment
- Part 2, 2.11.3.1.7, Preventing anchor lines from becoming entangles or damaged
- Part 2, 2.11.3.1.17 and .18, Ropes snagging
- Part 2, 2.11.8, Exclusion zones
- Part 3, Annex A, Risk assessment

7.2 For a list of current (and archived) ‘safety communications’ by IRATA, see www.irata.org

8 RECORD FORM

8.1 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.

9 FURTHER READING

IRATA Topic Sheet No. 11, Dropped objects
IRATA Topic Sheet No. 12, Hazard identification and risk assessment
Steep ground working (HSE) (https://www.hse.gov.uk/treework/safety-topics/steep-ground.htm)

1 www.irata.org/downloads/2055

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM					
Site:					
Date:					
Topic(s) for discussion:			Topic Sheet No. 4: Geotechnical work		
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:					

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SAFETY AND HEALTH TOPIC SHEET NO. 5: SAFE RIGGING OF ROPE ACCESS EQUIPMENT

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Safe rigging is achieved when all components of a rigged system have been planned, implemented and checked before a technician connects to and loads their rope access system.

1.2 The primary consideration of safe rigging is to ensure that the technician's rigged system provides complete protection whilst suspended.

2 WHAT CAN GO WRONG …

2.1 A rigged system that is <u>not</u> safe may result in equipment and rope failure; a near miss; and injury (minor through to a fatality).

2.2 The type of injury is typically impact trauma; whether impacting the ground; impacting a structure; or side impact from an uncontrolled swing.

Case studies
A technician's ropes were destroyed when an elevator was accidently activated despite isolations being in place. The technician was able to get to a beam for support before his ropes failed.
In two separate incidents, ropes were melted from, (a) existing pipework (thought to be cold) and, (b) from introduced lighting equipment. In the first case a Level 3 supervisor noticed the ropes melting against the pipe and prevented rope failure by having the technician reposition away from the heat source. In the second, a halogen lamp came in contact with the ropes for a sufficient length of time that they melted through. The ropes were not being used at the time.
A technician suddenly dropped whilst loading his ropes at a mid-level point. It was concluded that the ropes had "snagged" at an unseen location and then released when the technician weighted the ropes. The anchors loaded, stopping his fall just before ground impact.
Catastrophic failure of ropes occurred when ropes were rigged over an unprotected edge.

3 WHY THINGS CAN GO WRONG …

3.1 Rigging a set of ropes is our 'stock in trade'. There is the potential to overlook rigging basics, including pre-checks, particularly if the task presents obvious hazards, e.g. erecting and dismantling steelwork, electrical works or welding on rope.

3.2 Procedural shortfalls are present in many case studies (see above, for examples). Often, the control measures proposed by technicians (as noted in incident reports, after the fact) were simple and could have been implemented before any ropes were rigged.

3.3 Questions that could be asked include:

- Is the level of isolation adequate, given the potential consequences?
- Have all team members been inducted into the area and have they contributed to the process of hazard identification?
- Have other technicians checked the Level 3's rigging and ancillary equipment?
  - Would a secondary control measure be appropriate to confirm that rope access can commence?
- Has a safe pathway for the ropes been established, when planning the descent?
  - Has difficult communication between rigging personnel and technician(s) been prioritised as a hazard?
- Have <u>all</u> team members agreed on the rigging plan?
  - Has any potential sideways movement at the rope/edge interface been identified during the rigging set-up?
  - Has the hierarchy of edge protection been implemented?

4 WHAT YOU CAN DO …

4.1 Protection of your rigged system is fundamental. All rigging hazards should be addressed appropriately:

- Consult with team members on rigging options.
- Seek local knowledge of the environment, infrastructure and machinery.
- Utilise subject matter experts to identify specific hazards associated with any work that may affect your rigging system, e.g. welding, grit blasting, etc.

4.2 Once identified, consider the consequences of any hazard(s). If necessary, stop and ask your supervisor and/or manager for advice. Update the rigging plan, if required.

4.3 Apply all appropriate controls to reduce the risk. Plan and set up the rigging system with your team.

4.4 Implement procedural and physical control measures:

(a) If moving plant presents a hazard, apply a level of isolation appropriate to the severity of the consequence. De-energize and lock-out the plant if needed. Apply protocols that require multiple levels of acknowledgement before operating plant, e.g. clear, unimpeded communication combined with visual confirmation. If a consequence is severe, do not settle on low level controls, e.g. barricading.

(b) Employ physical controls:

- Tie off ropes at ground level.
  <u>NOTE</u>: This may introduce new hazards or force a change to the rescue plan, so always review.
- Bag ropes just below the technician.
- Deviate rope(s) away from hazards.

(c) Have your rigging checked by another team member. If that member is a Level 1, explain the system. This often serves as a prompt to check your own rigging. If the rigging area is remote or isolated, e.g. through grid-mesh or a hatch, and/or if there are a large number of tasks required to complete set-up, prepare a checklist with your team and manually check off tasks as completed. Consider whether dedicated radio communication may be appropriate for remote rigging to confirm that setup and other tasks are complete.

(d) Employ physical controls:

- Isolate remote rigging from third parties.
- Substitute potentially hazardous, ancillary equipment for less hazardous equipment. In the case of halogen lamps, replace them with LED lamps.
- Ensure adequate edge and/or rope protection, especially in the case where rigging is unsighted or unattended during works.

(e) Always treat obstructions and constraints affecting 'clear line of sight' as high risk. Consult your team members for solutions. Apply the hierarchy of controls.

- Can ropes be rigged to reduce or eliminate 'blind spots'?
  NOTE: Remember that changing a rigging plan can introduce new hazards, so always review.
- Position a team member at an alternate location to monitor visually the deployment of ropes and the subsequent task.
- Develop a protocol comprising visual, verbal and tactile communication strategies.
  NOTE: This must be recorded and understood by all. Rehearsal of the protocol should be undertaken prior to job start. Review and testing of the protocol should be ongoing and the job halted if protocol is inadequate.

(f) Choose your rigging options carefully

- Where possible, eliminate the need for ropes to run over an edge.
- When descending over an edge, consider carefully the selection of edge and/or rope protection.

  NOTE: Factors that contribute to the level of protection will include the angle at which the ropes go over an edge; the distance from the anchors; any sideways movement required by the technician. If sideways movement is unplanned check the suitability of the rigging before proceeding.

(g) Be critical of edges and obstructions:

- Check the material(s) from which they are made and their construction.
- Check their condition and suitability to support your ropes.

5 HOW YOU CAN DO IT …

5.1 Consider the following recommendations:

- Ensure that team members contribute to and understand the rigging system.
- Seek guidance from other experienced technicians and those with local knowledge or task knowledge.
- Utilise reference documents[1] for guidance on rigging techniques and potential rigging hazards.
- Don't underestimate or down play the consequences of a given hazard.
- Apply the hierarchy of controls when protecting ropes.
- Work to an approved rigging plan.
- Seek third party approval(s), where and if required.
- Ensure that physical controls are adequate for protecting your ropes.

[1] Such as the IRATA ICOP and 'Edge Management Poster'

6 ACTION

6.1 Review your management system's procedures for 'safe rigging'.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[2]:

- Part 2, 2.11.2, The anchor system (anchors and anchor lines)
- Part 2, 2.11.3.1, Rigging and de-rigging

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (v005, 20/05/2021)[3]

- 6.4, Rigging
- 6.5, Rigging for rescue and hauling

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

8 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.

9 FURTHER READING

Company policies and procedures
Manufacturers' user instructions
The international rigging and lifting handbook, NSL[4]

2 www.irata.org/downloads/2055
3 www.irata.org/downloads/2059
4 https://ascoworld.com/services/handbooks-media-and-safety-products

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 5: Safe rigging of rope access equipment	
Reason for talk:			
Start time:		**Finish time:**	
Attended by *Please sign to verify understanding of briefing*			
Print name:		**Signature:**	
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Matters raised by employees:		**Action taken as a result:**	
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Comments:					

SAFETY AND HEALTH TOPIC SHEET NO. 6:
EDGE MANAGEMENT: THE PROTECTION OF ROPES

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 In rope access work it is vital to ensure that ropes[1] are protected with a suitable method. An hierarchical approach should be adopted in order to determine the best achievable method of protection for ropes at a worksite.

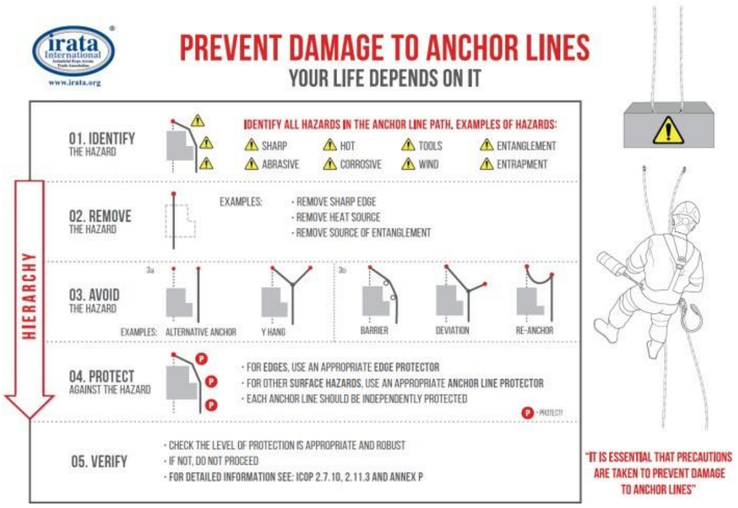
> ***"It is essential that precautions are taken to prevent damage to anchor lines, when they are in use. …"***
>
> ICOP, 2.11.3.2.1

2 BACKGROUND…

2.1 Once it has been established that rope access is an appropriate access system, and the hazards have been identified, the following process should be followed:

- **R**emove (the hazard, where feasible)
- **A**void (the hazard)
- **P**rotect (against the hazard).

2.2 This process may be remembered by the acronym 'RAP'. This hierarchy is listed in a *decreasing* order of priority. Accordingly, the most effective and reliable edge management measures will be those at the top of the hierarchy.



Poster – Prevent damage to anchor lines (IRATA International)

[1] The IRATA International code of practice (ICOP) adopts the term 'anchor line' for 'rope'.

3 IDENTIFY THE HAZARD …

3.1 Examples of hazards (non-exhaustive) that should be taken into account when protecting ropes include:

a) Sharp edges such as may be found on steelwork, cable trays, gratings, glass façades, composite panels;

b) Abrasive edges and surfaces such as coping stones, rock protrusions, corroded structures;

c) Trapping and cutting areas such as manhole covers, hatches, doorways;

d) Heat sources and the risk of melting from such as hot pipes, exhaust gases, lighting;

e) Hot work such as welding or cutting;

f) Corrosive substances such as chemical deposits or spillages;

g) Tools such as angle grinders, chainsaws, ultra-high-pressure lances, grit blasters, power drills.

> *"Great care should be taken when choosing an anchor line protector that it is going to offer sufficient protection against the surface with which it may be in contact. It should be able to withstand use in the chosen location without wearing through or melting and exposing an anchor line to the abrasive or hot surface. Anchor line protectors used to protect against hot surfaces should be of a type intended for this purpose."*
>
> ICOP, 2.11.3.2.7

4 REMOVE THE HAZARD (WHERE FEASIBLE) …

4.1 Examples include:

- Removing a sharp edge;
- Removing a heat source;
- Removing a source of entanglement.

5 AVOID THE HAZARD …

5.1 Examples include:

- An alternative anchor;
- A y-hang;
- The provision of a barrier;
- Introducing a deviation;
- Using a re-anchor.

6 PROTECT AGAINST THE HAZARD …

6.1 Examples include:

- For edges, using an appropriate edge protector;
- For other surface hazards, use an appropriate rope protection;
- Each rope should be independently protected.

7 ACTION

7.1 Review your management system's procedures for the protection of ropes.

8 REFERENCES

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition)[2]:
- Part 2, 2.7.10, Protectors for anchor line
- Part 2, 2.11.3, Use of anchor lines
- Part 3, Annex P, Recommended actions for the protection of anchor lines

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (v005, 20/05/2021)[3]
- 6.2.3, Hazard identification and risk assessment
- 6.4, Rigging
- 6.4.6, Hazard avoidance and rope protection
- 6.4.8, Deviations
- 6.6.12, Edge obstructions at the top

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

IRATA:
- Video
- Toolbox talk
- Poster, https://irata.org/downloads/3103

2 www.irata.org/downloads/2055
3 www.irata.org/downloads/2059

Topic Sheet No. 6
The protection of ropes

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM	
Site:	
Date:	
Topic(s) for discussion:	Topic Sheet No. 6 The protection of ropes
Reason for talk:	

Start time:		**Finish time:**	

Attended by *Please sign to verify understanding of briefing*	
Print name:	**Signature:**
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Matters raised by employees:	**Action taken as a result:**
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Comments:					

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SAFETY AND HEALTH TOPIC SHEET NO. 7: HOT WORKS

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 'Hot work' is any process that can be a source of ignition when flammable material is present or can be a fire hazard regardless of the presence of flammable material in the workplace[1].

1.2 When combining hot works with work at height there are additional risks that need to be considered, as well the risks normally associated with both hazards.

1.3 It is common for the most obvious risks associated with hot works to be considered and controlled (e.g. fire, burns), but the risk assessment process must consider the potential impact of hot works on the work at height risk.

2 WHAT CAN GO WRONG …

2.1 A 'hot work' incident may result in fire and injury. It may also damage equipment, in particular that made from textile material.

3 WHY THINGS CAN GO WRONG …

3.1 There are things that can go wrong. Consider and discuss the following scenario. What additional considerations should have been made for this situation?

Scenario Hot works incident: What may need to be considered?
A technician is required to remove a cleat from a steel structure, via gas cutting. They must descend to the point of work, 15 metres below, undertake the work and then return via ascent. The technician is trained and certificated to undertake the task. There is no point of exit below. There are no sharp edges, although the technician needs to be able to move over some pipework and control the trailing hose. There is a 'top man'. The system is 'rigged for rescue'. There is no foreseeable risk of fire, but a high risk of heat being retained in the material and structure. During the task a piece of molten metal drops onto the technician's leg. It burns him severely, causing him to drop the torch. The technician faints and passes out. You have an unconscious technician, with a severe burn and hanging 15 metres below you, with a lit torch. **Cont./…**

1 Source: https://en.wikipedia.org/wiki/Hot_work

Cont./…

Examples of additional considerations for this situation include:

1. Can any tools be isolated?
2. Can the technician be injured further through unconscious contact with the hot surface, or torch?
3. Can the technician be hauled to safety easily?
4. Is the unconscious technician likely to hit the hot surface or the pipes on the way up, doing more damage?
5. What additional rescue and first aid requirements are required for 'hot works'?
6. Has the technician secured himself to something for work positioning? (For instance, is a third team member required? If so, how will they be protected?)
7. Are all ropes and rigging protected from the heat?

(etc.)

3.2 This example highlights that with any 'hot work' at height you must consider both the risk from being 'at height' and the additional risks associated with 'hot work'.

4 WHY THINGS CAN GO WRONG …

4.1 Things may go wrong with 'hot work' for many reasons, including:

- A lack of consideration for increased rescue times and complexity.
- The increased potential and severity of damage to equipment and rigging.
- Changes to first aid requirements, and the enhanced need for careful casualty management.
- The risk of fire and explosion, with a greater fire-fighting requirement.
- Increases the need for correct work positioning, e.g. additional points of attachment to minimise the potential for accidental movement or slipping.
- The requirement for personal protective equipment may increase, leading to greater difficulty in access and egress.
- Spaces may be confined, enclosed or restricted, affecting access, egress and rescue.
- Rigging and the selection of a back-up device, e.g. grinding, cutting or burning require minimal contact to cause damage.
- Incorrect choice of rope and poor rigging, e.g. flame retardant rope is available; rigging that has not taken into account the path of the ropes resulting in poor hazard protection.

5 WHAT YOU CAN DO AND HOW TO DO IT …

5.1 You should:

- Undertake a thorough risk assessment;
- Consider the effect of 'hot' in all aspects of this assessment, e.g. take each task individually;
- Take into account how the hot work will impact on rigging, access and egress, task, rescue, flame retardant ropes, first aid, etc. - **all** elements of the job.

5.2 Care should be taken by technicians to protect against potential personal injury while carrying out hot work, e.g. by sealing the gap between overalls and boots or sleeves and gloves to prevent hot material such as weld or grit entering.

5.3 For certain types of hot work, rope access equipment such as ropes and harnesses may need special protection, e.g. ropes could be protected in the immediate hot work area by attaching heat resistant protectors around them.

6 ADDITIONAL CONSIDERATIONS

6.1 It is important to ensure that you have the right level of skill and experience in your rope access team; both rope work, rescue and task-specific.

6.2 Utilise intrinsically safe equipment – so-called ‘spark protection’.

7 ACTION

7.1 Review your management system’s procedures for ‘hot works’.

8 REFERENCES

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[2]:

- Part 2, 2.2.4.3(i), Hazard identification
- Annex M.5, Hot work
- Annex P.2, Examples of hazards

8.2 For a list of current (and past) ‘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

Safety in gas welding, cutting and similar processes (HSE)[3]

Guidance about welding and other hot work[4]

JSP 375 Vol 1, Chapter 31 (V1.2), Hot Working[6]

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2 www.irata.org/downloads/2055
3 www.hse.gov.uk/pubns/indg297.pdf
4 www.dmp.wa.gov.au/Safety/Guidance-about-welding-and-other-6670.aspx
5 www.uclan.ac.uk/safety_health_environment/assets/Hot_WorkPDF.pdf
6 www.go.uk/governemnt_JSP375_Vol1_Chapter_31_V1.2_Hot_Working_FINAL.pdf

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM					
Site:					
Date:					
Topic(s) for discussion:			Topic Sheet No. 7: Hot works		
Reason for talk:					
Start time:			**Finish time:**		
Attended by *Please sign to verify understanding of briefing*					
Print name:			**Signature:**		
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Matters raised by employees:			**Action taken as a result:**		
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SAFETY AND HEALTH TOPIC SHEET NO. 8: KNOTS IN THE END OF ROPES

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 IRATA training[1] teaches the importance of tying a 'stopper knot' to prevent a technician from descending off the end of a rope inadvertently. This is a very simple hazard to mitigate. However, it can be easily overlooked.

2 WHAT CAN GO WRONG …

2.1 The most obvious consequence of not tying a 'stopper knot' in the end of a rope (or using a mechanical stopping aid) is that a technician will descend off the end of their working or back-up rope, with an increased risk of serious injury or fatality. Accordingly, steps should be taken to remove this hazard.

Case study
Four sets of ropes were rigged through gratings. This prevented 'stopper knots' being tied as part of the initial rigging, with the result that they would need to be tied later. Not all the rigged ropes were suitable for the task to be undertaken, so the L3 advised the L2 of a new method of work. These were not made clear and were misunderstood by the L2. Whilst not contributory to the incident, it complicated the situation. The L3 and L2 both accessed the ropes to carry out the task. The L2 descended their ropes to a point where the back-up device came off the end of the back-up rope. Fortunately, the technician noticed and stopped their descent just short of the end of the working rope. There was insufficient rope remaining to lock off the descender, so the L2 maintained position until the L3 re-positioned their ropes to allow for a rescue.

3 WHY THINGS CAN GO WRONG …

3.1 Procedures were in place and there was a planned method of work. However, there was a human failure. Human failures occur for a number of reasons, e.g. 'errors' (a deviation from an accepted standard, leading to an undesirable outcome) or 'violations' (a deliberate deviation). The technicians did not do what their training had taught them. There were contributory factors, e.g. ineffective communication and uncertainty, but this lapse of memory nearly cost one of them their life.

3.2 If you are relying solely on the action of an individual to carry out a task, which if not done could result in a fatality or serious injury, then you should take steps to ensure that the task cannot be overlooked.

1 TACS, 6.4.3.2.2 (f)

4 WHAT YOU CAN DO …

4.1 Error control and reduction can be enhanced by ensuring that there are opportunities to increase the chance of detecting and correcting slips and lapses, e.g.:

(a) Pre-start task assessment briefings, highlighting the planned method of work (and, in particular, any changes agreed).

(b) Toolbox talks on the high-risk elements of the task. This is a way of engaging all those involved. Whilst mandatory elements may result in over-familiarity, simply discussing an action out loud should provide a 'memory jogger'.

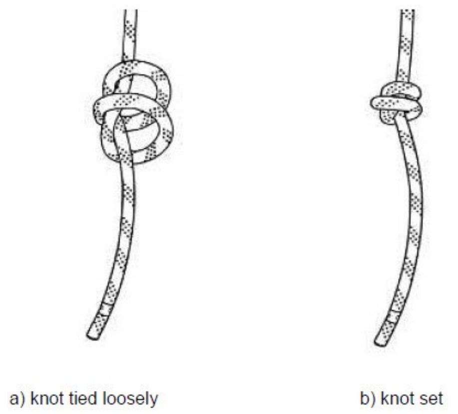
(c) Refresher training, building upon the core training provided by IRATA; which stresses the importance of tying stopper knots in the end of ropes.

(d) Ensuring that the risk assessment process is inclusive risk assessment, with the technicians helping to plan the work.

(e) The simple use of memory aids, e.g. tying a piece of cord or string on the first rope to be accessed as a physical reminder that something needs to be done.

5 HOW YOU CAN DO IT …

5.1 An example of a 'stopper knot' is shown in Figure 2.9 of the ICOP (below[2]). It can be tied at the bottom of the working and back-up ropes and when 'set' (tightened by hand) should have a tail of at least 300mm.



ICOP, Figure 2.9
Example of a stopper knot for use at the end of anchor lines
(in this example, half a double fisherman's knot)

2 See ICOP, Clause 2.11.3.1.11 and Figure 2.9

6 ACTION

6.1 When carrying out risk assessment, and rigging, consideration should also be given to exiting the rope at the bottom. Is the rope long enough? Should there be knots or aids to stop operatives inadvertently hitting the ground when descending?

6.2 Review your management system for the use of knots in the end of ropes.

7 RECORD FORM

7.1 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.

8 REFERENCES

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[3]:

- Part 1, Clause 1.4.2.5.5
- Part 2, Clause 2.11.3.1.11
- Part 2, Clause 2.11.7.5

8.2 For a list of current (and past) ‘safety communications’ by IRATA, see www.irata.org

3 www.irata.org/downloads/2055

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 8: Knots in the ends of ropes	
Reason for talk:			
Start time:		**Finish time:**	
Attended by *Please sign to verify understanding of briefing*			
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Comments:					

SAFETY AND HEALTH TOPIC SHEET NO. 9: UNCONTROLLED DESCENT

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 An uncontrolled descent may occur during rope access work, or during training. A candidate during training may be less experienced, or display a lack of familiarity with the equipment being used. They may also be handling a 'casualty' (increasing the mass), with the potential for injury to both parties.

1.2 An uncontrolled descent may not be a 'free fall', which would involve a loss or failure of one or more parts of the system, e.g. severed rope or rigging point failure.

2 WHAT CAN GO WRONG …

2.1 A technician may lose control of their descender, either through failure or incorrect use.

Case Study
Whilst carrying out a task on a slope, an item of equipment suspended on a fabric sling was passed across the body of the technician, to be suspended on the opposite side. When changing the position of the equipment the sling became tangled with the handle of the descender accidentally operating it. The back-up device did not arrest the fall and the descent only stopped when the operative lost their footing and the descender handle was freed from the tangled sling. The outcome of this incident was a twisted ankle and some bruising.

3 WHY THINGS CAN GO WRONG …

3.1 Failure of the descender may be as a result of:

- Incorrect use;
- A failure to 'lock off' the device, either mechanically or by other means;
- Accidental operation, e.g. external source.

3.2 The choice of back-up device, and method of use, will affect the arrest of an uncontrolled descent.

3.3 The potential outcome of this type of incident can be a serious injury or fatality, especially if it occurs at low level or if there are obstructions or a structure below.

Case Study
A technician was using a descender and – for reasons not clear – lost control of their descent and fell to the ground. The descender did not have a 'anti panic function' and the technician was inexperienced in its use. The back-up device was being used contrary to the manufacturer's instructions.

4 WHAT YOU CAN DO …

4.1 Control measures include:

- The selection and use of suitable equipment. When selecting a descender and back-up device consider the conditions and work type. Different descending devices may be more suitable in different work situations. For example, this may be down to a device's ability to mechanically lock or its effective use on a slope, etc.
- Training and familiarity with equipment being used. A technician at any level may be trained and undergo assessment on a set of equipment not used by the rope access company they work for. The latter should ensure that 'familiarisation' training is provided, as well as periodic refresher training.
- Using equipment that conforms to an appropriate standard.
- Ensuring that the equipment is maintained in good working order.
- Using equipment with a mechanical lock or a 'panic locking' function.
- The close supervision of inexperienced technicians, in particular.
- Selecting equipment that is suitable for two-person loading (rescue) whilst maintaining controlled descent.

5 HOW YOU CAN DO IT …

5.1 Know what your policies say about the selection of a back-up device. Discuss the following points:

- Weather conditions. For example, some devices maybe less effective on wet ropes; some maybe harder to operate in cold conditions.
- The mass of the operative can make some descenders more difficult to use.
- Some descenders and back-up devices are much less effective when working on slopes.
- Rope contamination, e.g. mastic or paint on ropes, may influence both descenders and back-up devices.
- Used ropes and friction damage may affect performance.
  NOTE: Most product testing, type-testing and type-approval is undertaken using new rope.
- Mechanical defects or wear.
- The application of additional friction during descent (especially for rescue, where the mass is increased).

6 ACTION

6.1 Review your management system for the selection and use of the appropriate equipment to avoid uncontrolled decent.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:

- ICOP 2.7.5, Descending devices

7.2 For a list of current (and past) ‘safety communications’ by IRATA, see www.irata.org

8 RECORD FORM

8.1 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.

[1] www.irata.org/downloads/2055

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 9: Uncontrolled descent	
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:			

SAFETY AND HEALTH TOPIC SHEET NO. 10: POLICY, PROCEDURES AND PERMIT TO WORK

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 The following definitions are useful:

1.2 **Policy**

- *Clear, simple statements of how your organisation intends to conduct its business. They provide a set of principles to help with decision making.*

1.3 **Procedures**

- *How each policy will be put into action in your organisation.*

1.4 Each procedure should outline:

- who will do what;
- what steps they need to take;
- when they should be done (timescales); and
- which documentation to use (This may include forms, checklists, flowcharts, etc.).

1.5 Procedures are a documented way of doing something. Companies should establish their own procedures, in accordance with the ICOP and TACS; and appropriate to the scope of work.

1.6 In undertaking any work, the risk assessment(s) and method statement(s) should be familiar to you. Do not deviate from them without good cause. If in doubt, stop work and inform your supervisor. The work - and risk assessment, method statement and procedures - may need to be reviewed and amended before work starts again.

1.7 If you deviate from or ignore instructions and get caught - or something goes wrong - you may have little protection. That said, you should raise any concerns straight away rather than follow instructions blindly.

1.8 **Permit to work**

- *A system to ensure that authorised and competent people have thought about foreseeable risks and that such risks are avoided by using suitable precautions. It is not simply permission to carry out a dangerous job!*

1.9 A permit to work system is generally associated with a hazardous task and/or environment which needs to be properly managed, e.g. hot works, work at height, confined space work, etc. 'Hold points' will be identified and a permit issued before work can start. The process will require certain individuals to confirm that identified control measures have been identified and put in place.

Example
A sub-contractor needs to access a roof to undertake work at a height. The main contractor operates a permit to work system. Before a permit is issued, the main contractor ensures that a risk assessment and method statement is in place; and that all the necessary controls are in place for the work to be carried out safely, e.g. trained workers, barriers, personal protective equipment, etc. Only then will they allow access to the roof via a locked plant room. Once the work is completed the permit is closed ('signed off') by all those involved; indicating that checks have been made that the work area is safe and secure.

2 WHAT CAN GO WRONG …

2.1 Consider the following scenarios. You may be able to think of other examples, based on your own experience?

Scenario: Procedures
A rope access technician, when carrying out a task, deviated from the agreed procedure as he thought that his way would be quicker and easier. There was an accident and an expensive item of equipment was broken. Although the equipment breakage was an accident, because the technician deviated from the procedure they were deemed responsible for the breakage and subsequently disciplined. *Procedures are not only in place for safety.*

Scenario: Permit to work
A permit to work system was in place to access a roof in order to undertake work at a height. When the technicians arrived they 'signed on' to the system and given access to the roof. When the task was complete the permit was 'closed off' by the client. One of the conditions of closing the permit was that the plant room access was locked by the client, in order to prevent unauthorised access. Later that week a worker accessed the roof, which had not been locked, and was seriously injured in a fall. Liability lay with the client as the permit, as a required control measure had not been implemented. *Permits to work are not just for safety, they also provide proof of liability.*

What can go wrong?
What examples can you think of ….

3 WHY THINGS CAN GO WRONG AND HOW TO PREVENT IT …

3.1 Things can go wrong for a number of reasons. Ensure that you implement measures to prevent failure. Some examples are given:

3.2 **Procedures**

- **Deviation from procedures**
  - Review procedures to ensure they are correct; up to date; effective; and identify the correct training and supervision

3.3 **Permit to work**

- **Not used**
  - When assessing a task look at the control measures required and identify whether a permit to work system would help ensure that they are implemented. Make it clear to staff and sub-contractors exactly which task(s) require the completion of a permit. A permit is not always required.
- **Not completed**
  - Whether issuing a permit, or working under it, you should ensure that it has been completed properly. Follow the control measures identified. Close out the permit as required; and ensure that there are people available to do so. Try and keep things simple. If the entire process is laborious and time-consuming it is more likely to be ignored.

Not fulfilling the requirements for procedures and a permit to work may result in accidents, injuries or fatalities.

It may also result in disciplinary proceedings or loss of jobs without an accident necessarily having happened.

4 ACTION

4.1 Review your management system, in particular for the need to implement a permit to work.

5 REFERENCES

5.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:
  - Part 1, 1.4.2.6 Exclusion zones
  - Part 2, 2.2.6, Procedures and personnel to be in place before work begins
  - Part 2, 2.11.7, Pre-work checking (and, specifically, 2.11.7.1, Permit to work)
  - Part 2, 2.11.8, Exclusion zones
  - Part 2, 2.11.14, Termination of a job

[1] www.irata.org/downloads/2055

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

6 RECORD FORM

6.1 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.

7 FURTHER READING

Guidance on permit to work systems, A guide for the petroleum, chemical and allied industries (HSE, HSG250)[2]

Permit to work systems (HSE)[3]

2 www.hse.gov.uk/pubns/priced/hsg250.pdf
3 www.hse.gov.uk/comah/sragtech/techmeaspermit.htm

Topic Sheet No. 10
Policy, procedures and permits

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM					
Site:					
Date:					
Topic(s) for discussion:			Topic Sheet No. 10: Policy, procedures and permit to work		
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 11: DROPPED OBJECTS

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 The IRATA Work & Safety Analysis 2021 (Section 4.6) identifies that the most numerous cause in reports was 'falling objects' (with many reports referring to loose objects discovered by rope access technicians). The category is sub-divided into 'potential dropped objects' (17) and 'actual dropped or falling objects' (42). The former included a large range of tools (e.g. hammer, wrenches, jack), sections of pipe and plate, steam lance, shackles and even rope access gear left by previous workers. Actual dropped objects included rope access devices (17), mostly dropped by trainees. The remaining items dropped by technicians included rope access devices and tools, a battery, phones, a helmet, beam clamp and various structural materials and dislodged ice.

1.2 'Falling or dropped objects' is one of three consistently significant areas of concern for rope access technicians. The following advice outlines the risk management measures that should be considered when planning jobs.

2 HIERARCHY OF CONTROLS

2.1 The risk presented by dropped objects can be managed by adopting an hierarchical approach (see **Figure 1**), with the level of protection reducing as the lower levels are reached.

High	Level of protection	Elimination
		Engineering controls
		Administrative controls
Low		Personal protective equipment

Figure 1 - Hierarchy of controls

2.2 This hierarchy is similar to the framework set out by the 'hierarchy of fall protection': avoid; prevent; mitigate (i.e. minimise the distance and consequences of a falling or dropped object).

2.3 Some measures are 'collective' (and 'passive'), e.g. safety nets. Others are 'personal' (and 'active'), e.g. tool lanyards. It is important to select suitable equipment, taking account of the mass of the object being retained and the situation in which it is to be used.

2.4 There are two types of falling or dropped object:

(a) **Static** An object that may drop from its previous static position under its own mass, e.g. a light fitting that drops due to its fasteners coming loose over time.

(b) **Dynamic** An object that drops from its previous static position due to the force applied by a person, wind, equipment, machinery or moving object, e.g. an object being knocked off a platform and dropping to a level below.

3 ELIMINATION

3.1 Where possible, the elimination of a hazard - or avoidance - must always be the preferred option.

3.2 Undertake 'pre-job' checks or surveys to look for potential problems, e.g. bolts left on ledges, loose or unstable masonry, projections or tangle threats, etc.

3.3 This is particularly important after a period of bad weather, on new sites, after third party operations in the same vicinity, etc.

3.4 Ensure that pockets are empty and inspect carefully any tools prior to starting work, e.g. loose hammer heads, poor security fixings for lanyards, etc. Consider special precautions when using 'high energy' hand tools.

3.5 Do not try and carry too many items.

4 ENGINEERING CONTROLS

4.1 If the hazard cannot be eliminated, engineering controls are the preferred approach to risk reduction. This involves the use of equipment to reduce the potential for dropped objects (or, preferably, prevent them from being dropped), or to reduce the risk if an object does fall.

4.2 Examples include:

- temporary covers being placed around and/or over openings;
- work clothing has pockets these should be capable of being securely closed; preferably, don't put loose items in pockets;
- tools being transported in securely closed containers, e.g. when being lifted between levels;
- lightweight hand tools, communication equipment, etc. being tethered to the technician;
- replacing a hand-held torch with a helmet mounted head torch;
- heavier tools and components being separately tethered;
- using safety netting to catch tools or equipment that cannot be tethered, e.g. bolts;
- providing 'hard' barriers, toe boards, etc. to form an exclusion zone, where it is not possible to prevent dropped objects.

5 ADMINISTRATIVE CONTROLS

5.1 Administrative controls, to be used in conjunction with the other controls in the hierarchy, involve providing:

- information and warnings to technicians about hazards that are present;
- procedures and instruction on how to carry out the work safely;
- supervision to ensure that any procedures are being followed;
- management processes to determine any 'lessons learnt'.

5.2 Examples of administrative controls are:

- hazard awareness, e.g. at induction;
- warning signs, to highlight any hazards to the workers;

- planning activities to avoid situations where work is being carried out at multiple levels simultaneously;
- lookouts to prevent people entering an area below where technicians are working;
- high levels of workplace housekeeping, i.e. keeping works areas clear of loose material or objects;
- operating systems to check that all tools and components have been removed from, or secured in, the work area prior to completion of the task;
- processes for reporting, investigating and learning from hazardous observations and incidents involving falling objects (and developing a culture in which reporting is encouraged).

6 PERSONAL PROTECTIVE EQUIPMENT

6.1 This is the last method of protecting an employee.

6.2 Industrial safety helmets provide limited protection only, due to the high level of kinetic energy that falling and dropped objects possess. A helmet protects the head only, so other areas of the body are unprotected from dropped objects and serious injuries can easily be suffered, e.g. face.

7 ACTION

7.1 Review your management system for falling object and risk management procedure(s).

8 REFERENCES

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:
  - Part 1, Clause 1.4.2.6
  - Part 2, Clauses 2.11.8.1 and 2.11.8.2
  - Annex M, Use of tools and other work equipment

(b) IRATA Work and Safety Analysis 2021[2]

8.2 For a list of current (and past) '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.

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1 www.irata.org/downloads/2055
2 https://irata.org/downloads/14571

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 11: Dropped Objects	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 12: HAZARD IDENTIFICATION AND RISK ASSESSMENT

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 As well as being a legislative requirement, hazard identification and risk assessment are important. Undertaking work at a height introduces increased risk. In simple terms:

- a **hazard** is something that has the potential to cause harm to anyperson, property or animal; and
- a **risk** is the likelihood of that harm actually occurring.

2 WHAT CAN GO WRONG …

2.1 Even the simplest of tasks can carry an increased level of risk when undertaken at height, e.g. changing a battery or a drill bit can result in a serious incident if they are dropped. Likewise, a relatively small injury, sprain or muscle tear can become very serious when working at height. Any number of small incidents can be increased in severity when happening at height.

Case study
A wind turbine nacelle was incorrectly isolated by the on-site supervisor. As a result, the nacelle rotated slightly whilst two rope access technicians were descending over the edge at the top of the nacelle. - The technicians immediately made themselves safe and called the on-site supervisor. The work was put on hold whilst the rope access team and on-site supervisor investigated what had gone wrong. No one was hurt.

3 WHY THINGS CAN GO WRONG …

3.1 Managers, supervisors and technicians sometimes underestimate things with the potential to cause harm (the hazard). They do not:

(a) check manufacturers' instructions;

(b) look back at accident and ill-health records – that may help identify the less obvious hazards;

(c) think about the issues that surround the rope access work itself;

(d) take into account the advice and guidance available, e.g. ICOP.

3.2 Those involved do not always understand the risk assessment process. Sometimes, the technicians are not consulted.

4 WHAT YOU CAN DO …

4.1 You should:

(a) accurately identify potential hazards in your workplace;

(b) think how employees might be harmed (or others who may be present, such as contractors or visitors);

(c) decide how likely it is that harm will occur, i.e. the level of risk, and what to do about it;

(d) make a record of significant findings;

(e) review what you are doing on an ongoing basis.

4.2 All those involved in a task can contribute to hazard identification and risk assessment. You may not have been involved in the initial planning, but risk assessment is a continual process and goes beyond the initial paperwork.

4.3 The 'SLAM' technique reminds workers to stop work if they think their health and safety is at risk:

Stop

- Stop the task and think. Look at each step.

Look

- Look before, during and after completion of the task.

Assess

- Are workers equipped to perform the task safely?
- What else do they need to perform the task safely?

Manage

- Managers or site rope access safety supervisors should take appropriate action to eliminate or minimise any hazards on site.

5 HOW YOU CAN DO IT …

5.1 Ensure that the process for risk assessment and hazard awareness used is:

- Site specific;
- Task specific;
- Comprehensive;
- Simple to understand;
- Continuous; and
- Inclusive of all those involved.

5.2 Ask:

- Is this a new task?
- Has the task changed?
- When was the last time I did this task?
- Do I feel comfortable doing this task?
- If not, do I need training?
- Are isolation(s) required?

6 ACTION

7.1 Review your management system's procedures for hazard identification and risk assessment.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:

- Part 2, 2.4, Risk assessment
- Part 3, Annex A, Risk assessment

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (v005, 20/05/2021)[2]:

- 6.2.3, Hazard identification and risk assessment

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Risk assessment: A brief guide to controlling risks in the workplace, HSE, INDG163[3]
Leadership and worker involvement toolkit, The SLAM technique, HSE[4]
Leadership and worker involvement toolkit, HSE[5]

1 www.irata.org/downloads/2055
2 www.irata.org/downloads/2059
3 www.hse.gov.uk/pUbns/indg163.pdf
4 www.hse.gov.uk/construction/lwit/assets/downloads/slam.pdf
5 www.hse.gov.uk/construction/lwit/index.htm

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 12: Hazard identification and risk assessment	
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:			

A topic sheet prepared by © IRATA International (2017)

SAFETY AND HEALTH TOPIC SHEET NO. 13: FALLS DURING TRAINING

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Training courses provide an environment in which inexperienced trainees may be susceptible to injury, including falls from a height.

1.2 It is important to remove the risk of a trainee falling during training, to avoid injury to trainees and/or trainers.

1.3 A specific risk assessment shall be made for the training area and appropriate control measures detailed and implemented[1].

1.4 It is essential that all trainees - whether a first time Level 1 or recertifying Level 3 - are closely supervised and, importantly, receive clear instructions prior to the start of any training.

2 WHAT CAN GO WRONG …

2.1 Things can go wrong for a number of reasons. For example, a trainee may:

- abseil off the end of the rope;
- incorrectly load and/or use their descender;
- fail to close the side plate on their descender;
- trigger an uncontrolled descent;
- end up in an uncontrolled descent with a 'casualty';
- use their equipment, e.g. back-up device, incorrectly;
- use damaged or unsuitable equipment;
- feel over-confident;
- not be supervised closely.

Case study 1
A trainee - the 'rescuer' - ended up in an uncontrolled descent. As they started to pick up speed, they lost control of the descender and failed to release their back-up device. This resulted in both the 'rescuer' and 'casualty' sustaining broken ankles on hitting the ground. The supervisor did not directly witness the incident.

1 Form 006, *Requirements for any IRATA training venue*, should be completed and posted in any training area(s).

Case study 2
A trainee - the 'rescuer' - had their ropes on the opposite side to that taught. Their back-up device locked up on the ropes when at about 2.5m from the ground, with the casualty suspended below. They locked off their descender in order to release the back-up device. When recommencing descent, the 'rescuer' controlled the handle of their descender with their right hand (instead of their left) and released their back-up device without holding the tail of their working rope; resulting in a rapid descent. The 'casualty' sustaining a broken leg. **Source:** IRATA Safety Bulletin 21.1, Rescue training incidents (28 July 2011)

Case study 3
Two Level 1s were practicing a snatch rescue (for the third time) about 3m from the ground, using a single set of ropes. As the 'rescuer' operated the 'casualty's' descender, to bring their weight on to the rescuer, the working line suddenly came out - with a loud noise - leaving both Level 1s suspended from the rescuer's back-up device. The unclosed descender had held the rescuer's weight up to this point. The Level 1s were quickly removed to ground with no ill effects, apart from minor rope burns to the rescuer's hand. **Source:** IRATA Safety Bulletin 12, Descender incident, Failure to check catch on side plate (December 2009)

3 WHY THINGS CAN GO WRONG …

3.1 Falls during training can occur for a number of reasons. For example:

- incorrect threading of a descender;
- not checking that the side plate or catch is correctly closed;
- not listening to, or ignoring, the trainer's instructions;
- instructions not clearly provided by the trainer;
- poorly rigged ropes;
- rushing the task;
- nervousness during assessment;
- equipment failure.

4 WHAT YOU CAN DO …

4.1 Trainers and/or assessors should:

- assess the risks in the training area (significant risks should be recorded in writing);
- make sure that trainees undertake pre-use and function checks;
- ensure that trainees utilise 'buddy checks';
- monitor trainees carefully;
- ground control the trainee's main descent rope, if appropriate;
- ensure that there are knots in the ends of all ropes.

4.2 Trainers and/or assessors should also make sure:

- that ropes are long enough;
- the trainee understands any instructions;

- that all ropes are rigged correctly;
- that the trainee is put at ease and encouraged.

4.3 Trainers and assessors should:

- check that a trainee’s back-up device and descender are loaded correctly;
- aim to put the trainees at ease.

4.4 When training, the training company should assess the need for crash mats, particularly in the early stages of training;

4.5 Ensure increased supervision for trainees when carrying a rescue.

5 HOW YOU CAN DO IT …

5.1 The risk of falling from a height during training can be reduced by:

- the close monitoring of trainees;
- good communication;
- providing additional trainers, where possible, i.e. increasing the trainee/trainer ratio;
- limiting the number of trainees ‘on rope’ at any one time.

6 ACTION

6.1 Review your management system’s procedures for the control measure to be taken to protect against falls from height during training.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[2]:

- Part 1, 1.4, Principles and controls
- Part 2, 2.5, Training

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (v005, 20/05/2021)[3]:

- 4.4.2, Training ratios
- 6.2.3, Hazard identification and risk assessment
- 6.2.4, Selection of access method
- 6.2.5, Selection of personnel and competence
- 6.2.8, Planning for emergencies
- 6.5.1, Rigging for rescue
- 7.7.13, Training venue risk assessment
- 7.7.14, Live ‘casualty’ risk assessment

2 www.irata.org/downloads/2055
3 www.irata.org/downloads/2059

- 7.7.17, Rescue plans
- 9.2.1, Pre-training course checklist

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

BS 8454:2006, Code of practice for the delivery of training and education for work at height and rescue.

IRATA Trainer File.

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 13: Falls during training	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 14: PROTECTION AGAINST ENVIRONMENTAL CONDITIONS

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Working in any of the following environmental conditions can be hazardous:

- wind;
- wet and cold;
- hot; and
- ultra-violet radiation.

1.2 Before starting work in any of these conditions, and during the work itself, consideration should be given to what can go wrong and whether it is really necessary to do the work at that time. A suitable risk assessment for any adverse conditions anticipated; and kept under review.

Case Study
The roof extractors in a mill were not operational, leading to high heat temperatures. A technician started to feel faint. Rehydration was issued to all technicians working in high temperature environments. A schedule was issued, limiting the time technicians were expected to work in the heat.

2 PROTECTION AGAINST WINDY CONDITIONS

2.1 Even the simplest of tasks can carry an increased level of risk when undertaken at height, e.g. changing a battery or a drill bit can result in a serious incident if they are dropped. Likewise, a relatively small injury, sprain or muscle tear can become very serious when working at height. Any number of small incidents can be increased in severity when happening at height.

2.2 Wind speeds, working height and inclement weather such as rain and cold are likely to affect working times when working at height.

2.3 Winds in excess of 37 kph; 23 mph; 20 knots; 10.3 m/s (conversions are approximate) are likely to affect a person's balance, with an increased risk of a fall from a height.

2.4 High winds can dislodge unsecured tools from working platforms and materials such as roofing, etc. with the risk of injury to people in the working area (and even to those outside of any existing exclusion zone(s) below).

2.5 Weather forecasts usually give 'mean' wind speeds. However, it is important to take into account the predicted 'gust' speeds.

2.6 If gust speeds are not known the approximate 'gust' speed, as a general guide, is twice the 'mean' speed (for all heights up to 35 m).

2.7 There is no definitive maximum wind speed at which rope access work should be stopped, as this depends on many factors, e.g. place of work; company policy; nature of the task. Your company operating procedure should state when work will be suspended and re-assessed.

2.8 As well as wind speed it is important to consider storms, lightning, the potential for vortices, etc.

2.9 Risk assessment should consider at least the following:

- effective communication;
- regular monitoring of wind speed;
- whether access and egress effected;
- whether steps to be taken to minimize or eliminate the risk;
- the well-being of the technicians.

3 PROTECTING AGAINST WET AND COLD CONDITIONS

3.1 Water conducts heat away from the body 25 times faster than air. Consequently, being wet can soon lead to hypothermia, especially in cool or cold conditions.

3.2 In addition to the ambient temperature, the cooling effect of the wind needs to be taken into account when protecting against the cold.

3.3 Hypothermia is a condition which occurs when the core temperature of the body drops below that required for it to function normally. An early sign of hypothermia is constant shivering. Shivering itself is actually a good sign, as it shows that a person's heat control system is still working.

3.4 Hypothermia is treated by preventing further body heat being lost and by gently rewarming the casualty. For mild hypothermia, some physical exercise by the casualty can be helpful in rewarming the body. Immediate medical attention should be sought if it is suspected that someone has more than mild hypothermia, because of its potential threat to life.

3.5 Staying warm and dry can be achieved by wearing multiple layers of clothing (known as layering) is a long-established and effective way of insulating the body from the cold. The effectiveness of layering has been enhanced over the years by the development of new materials and fabrics.

4 PROTECTING AGAINST HOT CONDITIONS

4.1 Rope access technicians who are exposed to hot and dry or hot and humid conditions, outdoors or indoors (e.g. near a furnace), are at risk of hyperthermia (not to be confused with hypothermia) and dehydration, with related illnesses such as heat stroke, heat exhaustion, heat cramps, heat rash.

4.2 The risk becomes greater as the temperature and humidity increase, especially for workers who have not been given time to adapt from more temperate conditions.

4.3 Both air temperature and humidity affect how hot a person feels. Humidity, which is moisture in the air, plays an important part in this feeling. Hydration is also important, as well as fatigue.

4.4 Workers become overheated in two primary ways:

- the environmental conditions; and

- body heat generated by physical activity.

4.5 The 'heat index' (see **ICOP, Annex O, O.4.2**)[1] is a single value that takes both temperature and humidity into account. It is a better measure than air temperature alone for estimating the risk to workers from environmental heat sources. The higher the heat index, the hotter the weather feels, since sweat does not readily evaporate and cool the skin.

Case Study
Two staff located on ground level were overcome by heat stress/dizziness and fainted as a result of extreme heat. Medical treatment was provided by the client. The staff returned to stores duties initially, before returning to normal site duties shortly thereafter. The work was rescheduled for cooler hours, with breaks. Staff were advised to consume a minimum of 6 to 8 litres of water per day (and monitored). A safety bulletin was issued and a toolbox talk undertaken on all sites.

5 PROTECTING AGAINST ULTRA-VIOLET RADIATION

5.1 Whilst most rope access work is outdoors - with its consequent exposure to the effect of ultra-violet (UV) radiation from the sun - it should be noted that welders, working indoors or outdoors, can be exposed to ultra-violet radiation from the welding arcs.

5.2 Exposure to ultra-violet radiation without proper protection can be hazardous, with the risk of sunburn, damage to the eyes and several types of skin cancer.

5.3 The strength of UV radiation varies, depending on:

- the world location;
- the time of year; and
- on a number of different weather factors.

5.4 Sunlight and, therefore, UV radiation is at its strongest during the summer and between 10:00 h and 16:00 h. However, there is UV radiation even on cloudy days.

5.5 The symptoms of sunburn should be considered.

5.6 The 'Sun Protection Factor' (SPF) is a number quantifying the effectiveness of sunscreens against UVB radiation (see **ICOP, Annex O, O.5**). SPF is measured in a laboratory under standardized conditions, so caution should be used when estimating the time a person can actually stay in the sun.

5.7 SPF may be rated not only in numbers (e.g. SPF 30) but also by description, intended to make the SPF system easier to understand:

- low protection (SPF 6 to SPF 14)
- medium protection (SPF 15 to SPF 29)
- high protection (SPF 30 to SPF 50)
- very high protection (SPF 50 plus)

5.8 The following should also be considered:

- appropriate personal protective equipment, e.g. clothing, sun glasses, etc.
- radiant heat, e.g. machinery, exhausts, flares, etc.

6 ACTION

6.1 Review your management system's procedures for protection against environmental conditions.

Case Study
A technician was working inside a tank and felt faint, due to the high heat conditions. The technician exited the tank. A 'safety stand-down' was held and all technicians to be hydrated. Water bottles were issued. Technicians were told to take regular breaks to ensure they didn't become faint, or over exert themselves in high temperatures.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[2]:

- Annex O: Protecting rope access technicians against environmental conditions

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Using the Heat Index: A Guide for Employers[3]

- Available online at

[2] www.irata.org/downloads/2055
[3] https://www.nalc.org/workplace-issues/body/OSHA-All-in-One-Heat-Guide.pdf

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 14: Protection against environmental conditions	
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:					

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SAFETY AND HEALTH TOPIC SHEET NO. 15: TOOL LANYARDS

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 A tool lanyard is designed specifically to be a point of attachment between small tools, equipment and a technician. There are numerous types of lanyards, made from various materials, constructed solely for the purpose of attaching small tools and equipment in order to prevent dropped objects.

1.2 Currently, there is no specific product standard for tool lanyards.

1.3 The basic requirement is to take suitable and sufficient steps to prevent the fall of any material or object[1]. If this is not possible, the requirement is then to take suitable and sufficient steps to prevent any person being struck by any falling material or object which is liable to cause personal injury[2].

2 WHAT CAN GO WRONG …

2.1 Tools and equipment that are not correctly secured for work at height can be dropped or displaced, causing serious injury.

Case Study
A pneumatic grinder was disconnected from the pneumatic hose and hung from its lanyard. An attempt was made to reconnect the grinder to the hose. During this process the lanyard knot failed, resulting in the grinder falling from height into the ocean.

Case Study
While performing window cleaning via industrial rope access the squeegee wiper fell down on the ground, inside the barricaded exclusion zone.

1 In the UK Work at Height Regulations 2005, Regulation 10(1), Falling objects: "… Every employer shall, where necessary to prevent injury to any person, take suitable and sufficient steps to prevent, so far as is reasonably practicable, the fall of any material or object …".

2 Regulation 10(2): "Where it is not reasonably practicable to comply with the requirements of paragraph (1), every employer shall take suitable and sufficient steps to prevent any person being struck by any falling material or object which is liable to cause personal injury.

3 WHY THINGS CAN GO WRONG …

3.1 Things can go wrong for a number of reasons. For example, tools and equipment may be:

- worn, damaged or have been subject to a shock loading;
- unattached, i.e. not be secured in any way;
- incorrectly secured (i.e. the lanyard or connectors are not suitable for the load; or the lanyard is tied and has the potential to come undone);
- too heavy for the lanyard (i.e. the rated capacity is exceeded);
- difficult to secure, or attached to the lanyard by a non-load bearing part;
- connected without considering all elements, e.g. batteries and sockets, etc.

3.2 Tool or equipment can become snagged, overloading the lanyard.

3.3 The tool lanyard may be unsuitable for the tool and/or task, e.g. interfere with its operation if snagged in a drill. Perhaps it needs to be elasticated.

3.4 The rope access industry has used accessory cord to secure tools and equipment. However, in selecting this option you must be sure that it is 'suitable and sufficient' and, in particular, that the knot can't come undone (or weaken the lanyard to the extent that it could then fail under an impact load).

4 WHAT YOU CAN DO …

4.1 You should select and use the correct type of lanyard for the tools and equipment being used; and the task being undertaken.

4.2 Due consideration should be given to the selection and use of lanyards for protection against dropped objects.

4.3 Think about the tools, equipment and tasks that you undertake. For example, a drill attached to a technician via the correct lanyard will still need its battery changing occasionally; also, the drill bit.

5 HOW YOU CAN DO IT …

5.1 You should:

- assess the type of lanyard required, to suit the tools and equipment being used;
- use tool lanyards suitable for the task, e.g. load capacity, length, flexibility, etc.;
- plan the work, remember that even the correct lanyard may make a task slower.

6 ACTION

6.1 Review your management system's procedures for identifying, procuring and using tool lanyards.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[3]:

- Part 3, Annex M, Use of tools and other work equipment, M.1.3, General

> "… Where tools and equipment are carried by the rope access technician, appropriate steps should be taken to prevent them being dropped or falling on to people below …"

- Part 3, Annex M, Use of tools and other work equipment, M.2.1, Small tools and equipment

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Working at height. A brief guide (HSE, INDG401)[4]

Recommended Guidelines for the Safe Use of Tools & Equipment at Height (DROPS)[5]

ANSI/ISEA 121-2018, American National Standard For Dropped Object Prevention Solutions (https://webstore.ansi.org/)

3 www.irata.org/downloads/2055

4 www.hse.gov.uk/pubns/indg401.pdf

5 https://www.dropsonline.org/assets/documents/Recommended-Guidelines-for-Safe-Use-of-Tools-at-Height-Issue-02-April-2011.pdf

Topic Sheet No. 15
Tool lanyards

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 15: Tool lanyards	
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:			

SAFETY AND HEALTH TOPIC SHEET NO. 16: MANUAL HANDLING AND STRAIN INJURIES

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 A common hazard encountered whilst carrying out rope access work is manual handling. It is important therefore to follow manual handling requirements when using or moving equipment and materials, particularly when working at height.

1.2 It is the employer's duty to avoid manual handling, so far as reasonably practicable, if there is a possibility of injury.

2 WHAT CAN GO WRONG …

2.1 'Manual handling' is any activity that involves lifting, lowering, pushing, pulling, carrying or moving, holding or restraining. It also includes sustained and awkward postures, or repetitive motions. If undertaken incorrectly, serious injury can occur to personnel.

Case Studies
"While bristle blasting the underside of the pipework, the technician felt a pulling sensation in their left shoulder when applying pressure. Technician came down and reported to medic." *No rescue was required.*
"Technician was climbing after lunch, between pipes and experienced pain in his shoulder. He was safe and sitting on pipes and alerted his team mates. A rescue was initiated where the supervisor climbed to him, prior to attaching a 3:1 system to the technician and hauling him to safety. The technician was stripped of his harness and walked away escorted to the medic." *The shoulder was found to be dislocated causing significant pain.*
"While performing rigging work, technician felt pain in his groin after repositioning and evacuated to surface. After resting, the pain was still present so technician reported to rig medic who evacuated him to hospital for inspection/diagnosis. Technician had passed a full medical examination and had been working without problems since then." *No rescue was required.*
Source: IRATA Safety Bulletin 32, Strain Injuries

3 WHY THINGS CAN GO WRONG …

3.1 Incorrect manual handling techniques can cause injury or harm to personnel, most commonly spinal injuries and knee/shoulder strains.

3.2 Repetitive strain injury impacts muscles, nerves, ligaments and tendons. This type of injury typically occurs from improper technique and/or repetitive motion, e.g. ascending.

4 WHAT YOU CAN DO …

4.1 A hierarchy of measures to reduce the risks of manual handling can be set out as follows:

- avoid hazardous manual handling operations so far as is reasonably practicable;
- assess any hazardous manual handling operations that cannot be avoided;
- reduce the risk of injury so far as is reasonably practicable.

4.2 The most effective measure is to avoid the need for manual handling completely.

4.3 Where it is not possible to eliminate the need for manual handling, reduce the consequence or likelihood of the risk by implementing one or more control measures. Ensure the most ergonomic body position in relation to the task and worksite.

4.4 You know your body best. Do not push it to its limits simply to “get the job done faster”.

4.5 Rope access work can be strenuous. When facing a physically demanding task, ensure that you warm up appropriately prior to undertaking any work.

4.6 If any discomfort is being experienced, whilst carrying out a task, stop the job and reposition yourself prior to commencing the task. If discomfort continues, or the task cannot be carried out safely, it should not be carried out at all.

4.7 If you experience pro-longed tenderness, stiffness or tingling an in affected area, seek advice from your medical practitioner.

5 HOW YOU CAN DO IT …

5.1 Apart from being a legal requirement, undertaking a risk assessment will help you implement the control measures.

5.2 Control measures include:

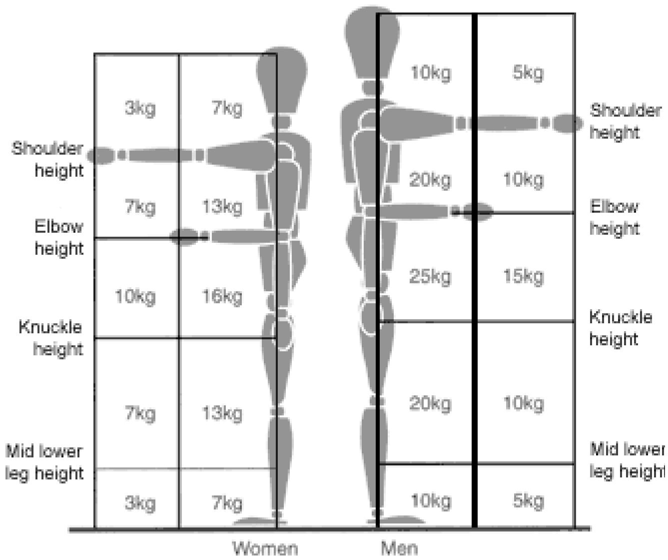
- Attending mandatory manual handling training session(s);
- Using ‘safe lifting’ manual handling techniques at all times (see below);
- Giving clear instructions on planed lifts, at tool box talks, etc.;
- Performing warm-up exercises before undertaking any strenuous activity.

5.3 When manual handling is inevitable make sure you use good manual handling practice, including:

- Use mechanical aids for lifting where possible;
- Performing movements smoothly and in a controlled manner;
- Bend knees when lifting loads from the ground or a low position;

- Hold loads close to the body;
- Carry out work in a comfortable position with proper breaks;
- Keep loads light and gain assistance when carrying heavy or unwieldy objects.

5.4 Advice[1] has been pushed on the sort of weights that are likely to cause injury:



5.5 The weights shown in the figure are not meant to be interpreted as 'safe limits'. Injury may still occur if lifting lighter loads when other 'risk factors' are present, e.g. an awkward lifting position, or if it exceeds an individual’s capability.

5.6 When handling the kinds of weights shown then a risk assessment is likely to be needed. Remember, the figures assume that you are lifting easily held, compact loads in ideal conditions.

5.7 Correct technique includes:

- Avoiding excessive bending or twisting;
- Gaining assistance to move heavy or awkward loads;

5.8 Don’t carry things up ladders unless in a bag.

5.9 Use rated lifting bags, etc. appropriate to the mass of the contents.

5.10 In addition, it is important to ensure that tools and equipment are secured when being used or moved around a work area. This may include:

- Securing tools and equipment to a belt or in a toolbox/container when not in use;
- Using a lanyard on hand tools while in use;
- Keeping tools and equipment away from unprotected edges;
- Hoisting materials, tools and equipment separately to a work area;

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1 See Appendix 3, Guidance on the Regulations (https://www.hse.gov.uk/pubns/priced/l23.pdf)

- Making sure that catch platforms and/or safety nets are in place before moving equipment, tools and materials.

6 ACTION

6.1 Review your management system's procedures for manual handling and strain injuries.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[2]:

- o Part 3: Annex A: Table A.3, Example of a risk assessment using risk value and residual numerical values
- o Part 4: 4.2.8, Manual Handling Operations Regulations

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (Edition 005, 20/05/2021)[3]:

- o 7.7.15, Rescue dummies
- o 7.7.16, Masses

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Manual Handling Operations Regulations 1992, SI 1992/2793[4]

- o amended by the Health and Safety (Miscellaneous Amendments) Regulations 2002 SI 2002/2174[5]

Manual handling, Manual Handling Operations Regulations 1992 (as amended), Guidance on Regulations, L23 (HSE)[6]

Manual handling at work, A brief guide, INDG143(rev3), (HSE)[7]

Making the best use of lifting and handling aids, INDG398(rev1) (HSE)[8]

Manual handling assessment charts (the MAC tool)[9]

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2 www.irata.org/downloads/2055
3 www.irata.org/downloads/2059
4 www.legislation.gov.uk/uksi/1992/2793/contents/made
5 www.legislation.gov.uk/uksi/2002/2174/regulation/7/made
6 www.hse.gov.uk/pubns/priced/l23.pdf
7 www.hse.gov.uk/pubns/indg143.pdf
8 www.hse.gov.uk/pubns/indg398.pdf
9 www.hse.gov.uk/msd/mac/

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 16: Manual handling and strain injuries	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 17: ISOLATIONS

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1,1 Oil refineries, oil and gas production installations and chemical processing plants are typically characterised by long lengths of continuously welded pipework and pipelines connecting process vessels, plant and installations. The contents are often hazardous substances, which may be flammable and/or toxic and are often at high temperatures and/or pressures. These are referred to as 'containment hazards' (and sometimes as 'stored energy').

1.2 These production installations and process plants, as well as other buildings and facilities, may also include 'personal injury hazards' and 'non-process isolation hazards':

- Mechanical equipment;
- Electrical equipment (including process control systems);
- Hazardous atmospheres in confined spaces;
- Special hazards, e.g. radioactive sources and static electricity.

1.3 Other industries also rely on isolations, e.g. railways, renewable, power generation and distribution, etc., before rope access work can commence.

2 WHAT CAN GO WRONG …

2.1 Any intrusive activity can allow the escape of hazardous substances. The implementation of adequate isolation practices is critical to avoiding loss of containment.

2.2 Additionally, any inadvertent movement of machinery or sudden release of potential energy in mechanical, electrical or pressure form is a hazard to workers. Isolation from sources of energy is required.

Case studies
When working at height a rope access technician was killed when one leg of his twin-legged energy absorbing lanyard was severed by a passenger lift that had not been isolated. **Source:** IRATA Serious Incident Briefing No. 1, Fall from a height
During derrick inspection activities whilst using rope access both ropes of a team member were destroyed, caused by accidental activation of the derrick elevator (near miss). **Source:** IRATA Safety Bulletin No. 37

3 WHY THINGS CAN GO WRONG …

3.1 Reasons that things can go wrong include:

(a) Poor procedures - or lack of procedures - outlining a safe system of work (including a permit-to-work);
(b) Poor design and maintenance;
(c) Human factors;
(d) Lack of clarity over roles and responsibilities;
(e) A lack of training and competence (including a failure to recognise the risk and/or the consequences); and
(f) Poor monitoring, audit and review.

3.2 Release of hazardous substances due to inadequate process isolation may lead to:
(a) Local immediate effects to people (death or injury) and to the environment.
NOTE: Long-term effects to people and the environment may be equally serious.
(b) Escalation of the initial release, causing wider damage to plant and other systems, e.g. damage resulting in further releases of content.

3.3 Possible non-process hazards include:
(a) Electrical (e.g. live cables and electrical equipment);
(b) Mechanical (e.g. cranes, lifts, rails, fork lifts, machinery, racking, etc.);
(c) Process/pipework (e.g. hot pipes, venting, pressure releases, valve operations (emergency shut down), gas/steam releases, etc.);
(d) Safety systems (e.g. deluge, exhausts (from emergency standby), sirens (sudden noise), flares, etc.);
(e) Location (e.g. rocks, weather, etc.);
(f) Third party intrusions (e.g. vehicles, rock climbers, residents, trespass, welders above, etc.).

4 WHAT YOU CAN DO …

4.1 The basic principles for risk management are to:
(i) Avoid the hazard, wherever possible;
(ii) Carry out risk assessment to evaluate risks that cannot be avoided;
(iii) Take action to reduce risks to ‘as low as reasonably practicable’ levels (ALARP); and
(iv) Reduce risks at source, wherever possible.

4.2 It is important to follow any risk assessment, permit-to-work and safe work method statement.

5 HOW YOU CAN DO IT …

5.1 **Hazards associated with mechanical machinery**

5.1.1 You should (if suitably qualified):
(a) Isolate hydraulic, pneumatic and process powered machinery by closing the appropriate isolation valves. Prevent any possibility of machinery movement by disconnecting the power fluid supply and return pipes, or otherwise making safe.
(b) Isolate engine-driven machinery by shutting off the engine fuel supply and then isolating all the starting systems. For electrically driven machinery, switch off the power supply to the motor and ensure that the equipment is securely disconnected and separated from all sources of electrical energy.

5.1.2 Any residual mechanical, electrical or pressure energy which may be locked within any part of the machinery mechanism should be safely released:

Mechanical

- High and low speed rotating elements need to be run down and springs released.

Electrical

- Capacitors should be discharged and batteries disconnected and/or removed.

Hydraulic

- Accumulators and pressurised pipework should be depressurised.

Pneumatic

- The system should be depressurised. If valves could be operated by residual trapped air, the line should also be disconnected.

Services

- Steam, gas or fuel may need to be depressurised, vented, purged or drained.

5.1.3 Even after disconnection of machinery power systems, or prevention of engines/motors from starting, there may still be a risk for people working on the machinery if it were to move, e.g. due to gravity. If so, fit a device such as a properly engineered ‘chock’ to lock the machinery in a safe position.

5.2 **Hazards associated with electrical equipment**

5.2.1 Hazards to workers include electric shock, electrical burns, and electrical arcing resulting in the ignition of flammable gas, vapours or materials. The provision of a safe system of work is fundamental to the effective control of risks. Different advice applies to the isolation of high voltage electrical equipment from that of low voltage equipment.

5.2.2 The main power circuit of the electrical equipment, plus any associated auxiliary circuits which constitute a hazard, should be electrically isolated. Disconnect and separate the electrical equipment from every source of electrical energy. Discharge any stored energy in the electrical circuits, taking particular care with batteries and capacitors.

5.2.3 Devices suitable for isolation include:

- Circuit breakers with the required contact separation and locking facilities;
- Disconnectors (commonly referred to as isolators) with locking facilities;
- Switch disconnectors with locking facilities;
- Plug and socket outlets;
- Fuse links; and
- Removable links.

5.2.4 ***In all case, whether high voltage or low voltage, you are advised strongly to seek advice from an electrical specialist.***

5.3 **Hazards associated with entry into confined spaces**

5.3.1 Entry into a confined space must be considered only where there is no reasonably practicable alternative way to carry out the work. Vessels, e.g. separators, tanks, reactors, distillation columns, etc., are the most obvious form of confined space, but sumps, pig launchers or work inside pipes or machinery modules can present the same dangers.

5.3.2 The hazards from entry include:

- Flammable or toxic vapours from process materials;
- Toxic vapours evolved from residues or their by-products (e.g. carbon monoxide may be evolved when a coking vessel is first opened to atmosphere);
- Asphyxiation from gases (e.g. nitrogen) used for inerting the confined space or adjacent areas;
- Oxygen depletion or enrichment;
- Carbon dioxide build-up; and
- Drowning by the ingress of liquid or free-flowing solid.

5.3.3 A very high standard of **positive isolation** should be achieved, by physical disconnection or the insertion of spades (for example).

5.3.4 You should eliminate or minimise 'hot work' wherever reasonably practicable. Any proposed site weld on or near process equipment should be justified by risk assessment. Where a system contains or has contained a flammable substance, isolation to carry out hot work such as welding or grinding will require additional precautions to mitigate against risks from residual material.

5.3.5 Consider the impact of hot work on any live systems in the vicinity of the worksite. You may need to isolate, depressurise and, if appropriate, drain any systems where hot work could cause fire or inadvertently breach containment of a hazardous fluid.

5.3.6 ***You are advised strongly to seek specialist advice on working in confined spaces.***

5.4 **Hazards associated with radioactive sources**

5.4.1 Radioactive sources are used for inspection and measurement purposes in various instruments. The source can normally be withdrawn into a shroud or housing in the instruments and this should be confirmed prior to carrying out nearby work by checking radiation dose rates. For extensive work, it may be necessary to remove the device to a secure source store to prevent it being damaged.

5.4.2 ***You are advised strongly to seek specialist advice. Local legislative requirements may apply.***

5.5 **Hazards associated with static electricity**

5.5.1 Vessel cleaning using high pressure water, solvent or steam jetting can create static electricity hazards.

5.5.2 ***You should seek advice on controlling the generation of electrostatic charges arising from jetting and other activities.***

6 ACTION

6.1 Review your management system's procedures for the safe isolation of plant and equipment.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]. Generic advice on isolations is given in:
- Part 2, 2.2.4.5, Risk assessment
- Part 3, Annex B, Safety method statements

(b) IRATA Topic Sheets:
- No. 10. Policy, procedures and permit to work
- No. 12, Hazard identification and risk assessment

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

The safe isolation of plant and equipment, HSG253, HSE (2006)[2]

City & Guilds SCQF Level 5, Competence in safe isolation of process plant and equipment[3]

Electricity at Work Regulations 1989, Guidance on Regulations, HSR25, HSE (2015)[4]

Electricity at work: Safe working practices, HSG85, HSE (2013)[5]

Series of standards: BS EN 60947, Low-voltage switchgear and control gear

Work with ionising radiation, Ionising Radiations Regulations 2017, Approved Code of Practice and guidance, L121, HSE (2018)[6]

PD CLC/TR 60079-32-1:2018, Explosive atmospheres - Electrostatic hazards, guidance, BSI[7]

Safe work in confined spaces, Confined Spaces Regulations 1997, Approved Code of Practice, Regulations and guidance, HSE (2014)[8]

Safe use of work equipment, Provision and Use of Work Equipment Regulations 1998, Approved Code of Practice and guidance, HSE (2014)[9]

1 https://irata.org/downloads/2055
2 www.hse.gov.uk/pubns/priced/hsg253.pdf
3 http://aset.co.uk/course/465
4 www.hse.gov.uk/pubns/priced/hsr25.pdf
5 www.hse.gov.uk/pubns/priced/hsg85.pdf
6 www.hse.gov.uk/pubns/priced/l121.pdf
7 https://shop.bsigroup.com/products/explosive-atmospheres-electrostatic-hazards-guidance/tracked-changes
8 www.hse.gov.uk/pubns/priced/l101.pdf
9 www.hse.gov.uk/pubns/priced/l22.pdf

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 17: Isolations	
Reason for talk:			
Start time:		**Finish time:**	
Attended by *Please sign to verify understanding of briefing*			
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Briefing leader *I confirm I have delivered this briefing and have questioned those attending on the topic discussed.*			

Print name:		**Signature:**		**Date:**	
Comments:					

SAFETY AND HEALTH TOPIC SHEET NO. 19: WORKING IN POOR LIGHT

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Because rope access work is carried out in such varied situations and conditions it is almost inevitable that some of it will be carried out where poor lighting conditions are present.

1.2 Poor lighting will not always be caused by night work, or by work carried out late in the day. Poor conditions may result from the site location and the conditions, e.g. working in an environment which is very dusty or heavily shaded in contrast to bright light.

1.3 Any poor lighting and poor visibility scenario may present a greater risk when carrying out tasks and manoeuvres; perhaps more so than rigging which is generally carried out in a fixed location and is thus easier to control.

2 WHAT CAN GO WRONG …

2.1 Any task being carried out on the ropes will be made more difficult by trying to carry it out in poor lighting, or a dusty environment. Health and safety guidance[1] gives guidance for lighting conditions and the type of lighting required for different levels of difficulty involved in the task. However, there is no specific measure or guidance for poor visibility caused by environmental conditions.

2.2 Any external factors that will or could adversely affect visibility need to be individually risk assessed and controlled.

2.3 Remember, poor visibility affects not only technician safety but also the efficiency and quality of the work.

Case study
Technicians were carrying out basic cleaning works in a dark and dusty environment. During the task the technicians had to carry out a simple rope transfer. Although the work site had adequate *task specific* lighting there was a stark contrast between light and shade throughout the structure, due to the limited locations in which lighting was positioned and its intensity. This made the rope transfers more awkward for the technicians as they had to move around to find adequate lighting in order to check their connections. The poor lighting and visibility increased the risk in a simple manoeuvre and decreased the efficiency of the task. **Source:** Technician experience

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1 Lighting at work, http://www.hse.gov.uk/pubns/priced/hsg38.pdf

3 WHY THINGS CAN GO WRONG …

3.1 Things can go wrong as a result of:

- (a) inadequate lighting and poor visibility;
- (b) poor assessment of the lighting requirements;
- (c) complicated manoeuvres;
- (d) poor selection of equipment;
- (e) no emergency or contingency plan.

4 WHAT YOU CAN DO …

4.1 You should:

- Assess every element of the task to be completed, including: rigging and de-rigging; the task itself; the location of any rope access manoeuvres, and ensure adequate and correct lighting for each aspect.
- Keep manoeuvres as simple as possible, particularly if the risk has already been increased by poor lighting and visibility; don't add to this.
- Select the right equipment in the right location. Task lighting can provide excellent lighting, but not in all locations.
- Consider where technicians will be looking in order to carry out a task. Are they likely to be constantly dazzled by lighting? Personal lighting may be required or preferable.
- Assess whether the lighting conditions are adequate for a rescue situation. Ensure there is there a back-up plan in the event of lighting failure or power outage, e.g. head torches or personal lighting.

5 ADDITIONAL CONSIDERATIONS

5.1 Lighting and visibility requirements may change during a task. This may be as a result of the time of day, the weather conditions or other variables.

5.2 Plan for changing conditions.

6 ACTION

6.1 Review your management system's procedures for work in poor lighting and visibility.

7 REFERENCES

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Lighting at work, HSE (1997)[2]

Construction site health and safety – Visibility, ATC Risk Management[3]

2 http://www.hse.gov.uk/pubns/books/hsg38.htm
3 http://www.atcrisk.co.uk/articles/construction-site-health-and-safety-visibility.php

Topic Sheet No. 19
Working in poor light

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM					
Site:					
Date:					
Topic(s) for discussion:		Topic Sheet No. 19: Working in poor light			
Reason for talk:					
Start time:		**Finish time:**			
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SAFETY AND HEALTH TOPIC SHEET NO. 20: CONFINED AND RESTRICTED SPACES

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 A 'confined space' is a place which is:

(a) substantially enclosed (though not always entirely), **and**

(b) where one or more specified risks are present or reasonably foreseeable.

2 WHAT CAN GO WRONG …

2.1 A number of people are killed or seriously injured in confined spaces each year. This happens across a wide range of industries, from those involving complex plant to simple storage vessels. This killed include people working in the confined space and those who try to rescue them without proper training and equipment.

2.2 Confined spaces, sometimes restricted in size, necessitate particular consideration by those undertaking rope access operations, in particular the access, egress and rescue requirements.

Case study
A number of technicians were cleaning the internal walls of a bunker when the contents on one side slid down. Due to the viscosity of the material, two of the technicians were trapped partially up to and including waist/legs. The alarm was raised and the site emergency services were deployed to assist with retrieval/rescue. The technicians escaped injury and returned to work the following day.

3 WHY THINGS CAN GO WRONG …

3.1 Things go wrong when the risks have not been identified.

3.2 Some confined spaces are easy to identify, .e.g. sewers and closed tanks used to store chemicals. However, some are not so easy to identify.

3.3 A confined space **is not necessarily**:

(i) enclosed on all sides;

(ii) small and/or difficult to work in;

(iii) difficult to get in or out of; or

(iv) a place where people do not work regularly.

3.4 A place that is usually not considered to be a confined space may become one if there is a change in the conditions inside or a change in the degree of enclosure or confinement (which may occur intermittently).

3.5 **Examples of a confined space.** The following locations and places may be a 'confined space' where there is a presence of, or a reasonably foreseeable risk of, one of the **specified risks** to the health and safety of those working in the space:

(a) Ducts, culverts, tunnels, boreholes, manholes, shafts, excavations and trenches, sumps, cofferdams, etc.;

(b) Freight containers, ballast tanks, ships' engine rooms and cargo holds;

(c) Buildings, building voids;

(d) Some enclosed rooms (particularly plant rooms) and compartments within them;

(e) Enclosures for the purpose of asbestos removal;

(f) Areas used for the storage of materials that are likely to oxidise, e.g. wood pellet hopper tanks;

(g) Unventilated or inadequately ventilated rooms and silos;

(h) Structures that become confined spaces during fabrication or manufacture; and

(i) Interiors of machines, plant or vehicles.

3.6 **Specified risk.** This means a risk of:

(a) Serious injury to any person at work arising from a fire or explosion;

(b) The loss of consciousness of any person at work arising from an increase in body temperature;

(c) The loss of consciousness or asphyxiation of any person at work arising from gas, fume, vapour or the lack of oxygen;

(d) The drowning of any person at work arising from an increase in the level of liquid; or

(e) The asphyxiation of any person at work arising from a free flowing solid or the inability to reach a respirable environment due to entrapment by a free flowing solid.

4 WHAT YOU CAN DO …

4.1 There are a number of key duties:

(a) Avoid entry to confined spaces, e.g. by doing the work from the outside;

(b) If entry to a confined space is unavoidable, follow a safe system of work; and

(c) Put in place adequate emergency arrangements before the work starts.

4.2 You should identify the **hazards**. Examples include:

(a) Flammable substance and oxygen enrichment;

(b) Excessive heat;

(c) Toxic gas, fume or vapour;

(d) Oxygen deficiency;

(e) The ingress or presence of liquids

(f) Solid materials which can flow;

(g) Other hazards not specific to confined spaces, e.g. electricity, noise, collapse or subsidence of or within the space, loss of structural integrity, etc.

5 HOW YOU CAN DO IT …

5.1 You should assess **factors** that affect the work:

(a) General condition of the confined space, e.g. previous contents, residues, contamination, oxygen deficiency and oxygen enrichment, physical dimensions;

(b) Hazards arising from the work, e.g. cleaning chemicals, sources of ignition, increasing temperature;

(c) Hazards from outside the space, e.g. ingress of substances;

(d) Emergency rescue.

5.2 The precautions required in a **safe system of work** will depend upon the nature of the confined space and the results of a risk assessment. The main elements to consider when designing a safe system of work, and from which may form the basis of a 'permit-to-work', are:

(a) Supervision;

(b) Competence for confined space working;

(c) Communications;

(d) Testing/monitoring the atmosphere;

(e) Gas purging;

(f) Ventilation;

(g) Removal of residues;

(h) Isolation from gases, liquids and other flowing materials;

(i) Isolation from mechanical and electrical equipment;

(j) Selection and use of suitable equipment;

(k) Personal protective equipment (PPE) and respiratory protective equipment (RPE);

(l) Portable gas cylinders and internal combustion engines;

(m) Gas supplied by pipes and hoses;

(n) Access and egress;

(o) Fire prevention;

(p) Lighting;

(q) Static electricity;

(r) Smoking;

(s) Emergencies and rescue;

(t) Limited working time.

6 ACTION

6.1 Review your management system's procedures for work in confined and restricted spaces.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:
- Part 2, 2.4, Risk assessment
- Part 2, 2.6.2, Rope access safety supervisors
- Part 3, Annex A, Risk assessment

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (v005, 20/05/2021)[2]:
- 6.2.3, Hazard identification and risk assessment

(c) IRATA Safety and Health Topic Sheets:
- No. 2, Near misses: Learning from failure
- No. 7, Hot works
- No. 10, Policy, procedures and permit to work
- No. 12, Hazard identification and risk assessment

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Safe work in confined spaces, Confined Spaces Regulations 1997, Approved Code of Practice and guidance, L101, HSE (2014)[3]

1 https://irata.org/downloads/2055
2 https://irata.org/downloads/2059
3 www.hse.gov.uk/pubns/priced/l101.pdf

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 20: Confined and restricted spaces	
Reason for talk:			
Start time:		**Finish time:**	
Attended by *Please sign to verify understanding of briefing*			
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Matters raised by employees:		**Action taken as a result:**	
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Briefing leader *I confirm I have delivered this briefing and have questioned those attending on the topic discussed.*					
Print name:		**Signature:**		**Date:**	
Comments:					

SAFETY AND HEALTH TOPIC SHEET NO. 21: FRAGILE, FRIABLE AND SOFT SURFACES

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 IRATA technicians work in many locations and on various sorts of potentially fragile, friable and/or soft surfaces. The most common material is probably glass, e.g. working in atriums or against large windows. With the evolution in use of rope access, it is not uncommon to find technicians working on large scale fabric structures[1], e.g. the O2 Arena, or on slate roofs.

1.2 Each of these different surfaces presents unique rope access-related hazards. Accordingly, a project-specific hazard identification and risk assessment must be undertaken. A generic assessment for working on or around fragile surfaces is never sufficient.

2 WHAT CAN GO WRONG …

2.1 The risks associated with a number of surface types follow. This list should not be considered exhaustive.

Surface Type	Associated risks
Glass	Very slippery when wet Fragile Sharp edges, particularly when broken Can become brittle with age The surface is reflective It can break in different ways, depending on the type of glass Breakages can be sudden and violent.
Slate roof	Very slippery when wet Brittle Fragile Sharp edges, particularly when broken Can be dislodged easily
Fabric	Very slippery when wet Can become brittle with age Can have unpredictable strength The surface is reflective Movement can be unusual, i.e. they can act like a large trampoline
Polycarbonate	Very slippery when wet Fragile Sharp edges, particularly when broken Tends to snap in sections (rather than crack) and then fail
Fibre cement board/ Asbestos containing sheets	Fragile Brittle Sharp edges, particularly when broken Asbestos dangers Become brittle with age
Cont./…	

[1] More commonly known as 'tensile fabric structures' (and manufactured typically from PTFE, ETFE or PVC)

Cont./…	
Roofing tiles	Brittle and/or fragile Sharp edges, particularly when broken Easily dislodged Can be slippery when wet
Stored material in silos, e.g. stone, gravel, etc.	Risk of collapse Entrapment

2.2 Working at height on or near fragile surfaces requires consideration of the fall protection hierarchy:

(a) Avoid;

(b) Prevent, e.g. by the use of a barrier;

(c) Mitigate, i.e. minimise the distance and/or consequence of any fall.

2.3 Collective protective measures take precedence over personal protective measures, e.g. fall arrest.

2.4 There needs to be a rescue plan. There is a need also to consider what might happen if there was a fall through a surface. For example, were there a fall through a glass atrium roof the ropes must not be damaged or cut; but were the same fall to occur through a large fabric panel then damaged or cut ropes are not really an issue.

2.5 It may be possible to use wire slings to prevent the glass damaging or cutting the ropes in event of failure. However, the high potential for severe injury when falling through glass means that any rescue procedure will need to be robust and effective, as lowering and/or hauling through broken glass is particularly difficult.

2.6 Technicians working on fabric surfaces may be using ropes (anchor lines) or suspended on tension lines. Large fabrics tend to be curved in shape and, in the event of fabric tearing, it is very important to know where the casualty or casualties might end up. If, for example, you have six operatives working on tension lines on a large fabric arch and the fabric tears or fails, you potentially have six casualties hanging in the bottom of large loops; a considerable distance below where they were.

Case study: Fabric roof

Technicians had been installing a large fabric roof over a sporting venue. To prevent falls from the structure they were working from tensioned lines; anchored up and over the fabric arch.

The span was large and not steep so the technicians could easily walk around the fabric surface to carry out the tasks.

There had been no issue with any of the access until a rain shower, when the fabric became very slippery. The tension lines prevented the operatives from falling off the structure, but did not prevent the higher technician slipping over and sliding down the structure, taking the operative lower down with him, until the slide was arrested at the anchors.

Neither operative was injured but this could have been much more serious had there been tools in use, or a longer slip.

Name some simple measures which could have prevented this from happening …

Case study: glass atrium
Rope access technicians had been installing window film on an old glass atrium. They were using crawling boards and tension lines, with the system incorporating steel slings within the back-up in the event that a technician should fall through the glass. Preventing a fall must always be the preferred method of work, but this is not always possible. In this case, the technicians where close to the glass and required a certain amount of movement to lean across to clean and install the film. A technician leant on the glass to install the film. The glass was old and brittle and gave way. The technician fell through the hole and was suspended on his rope and the back-up sling. The technician was not injured; and operatives placed a board across the span allowing the casualty to climb back up using his etrier.
Consider what might have happened if the casualty was injured, the rope had been cut and/or the casualty could not self-rescue …

3 WHY THINGS CAN GO WRONG …

3.1 There are a number of reasons for why things go wrong:

- The lack of a suitable and sufficient risk assessment and/or a poor method of working;
- Technicians may work with a false sense of security, thinking the surface that they are on or against provides more support than it does;
- The rescue plan may be ineffective in event of a failure;
- Technicians may not be aware of the properties of the surface, e.g. how it moves and reacts and what may cause a failure;
- Technicians maynot be aware that a surface **is** considered fragile (and they might not have been informed as such).

4 WHAT YOU CAN DO …

4.1 You should:

- Follow the hierarchy of fall protection;
- Make sure you know what you are working on and how it reacts to loads;
- Make sure that you have an effective rescue plan in place;
- Rig for the worst case scenario – think about what might go wrong!

5 ADDITIONAL CONSIDERATIONS …

5.1 When working on fragile surfaces it is very important to consider what is underneath them, i.e. what you might land on in the event of failure as well as what might land on others.

5.2 Working on toughened or laminated glass presents its own risks and hazards. Falling onto laminated glass can be likened to jumping onto a swimming pool cover that may or may not be well secured around its edges. If well secured, you still have to get back off it; and if not well secured you've pulled it in from its sides; and both you and the pane are at the mercy of gravity!

6 ACTION

6.1 Review your management system's procedures for work on or near fragile surfaces

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[2]:

- Part 2, 4.2.7, Work at Height Regulations

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Fragile roofs: safe working practices, HSE (2012)[3]

Health and safety in roof work, HSG33, HSE (2020)[4]

Advisory Committee for Roofsafety (ACR)[5]

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2 https://irata.org/downloads/2055
3 http://www.hse.gov.uk/pubns/geis5.pdf
4 http://www.hse.gov.uk/pubns/priced/hsg33.pdf
5 https://www.the-acr.org/

Topic Sheet No. 21
Fragile, friable and soft surfaces

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 21: Fragile, friable and soft surfaces	
Reason for talk:			
Start time:		**Finish time:**	
Attended by *Please sign to verify understanding of briefing*			
Print name:		**Signature:**	
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Matters raised by employees:		**Action taken as a result:**	
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Print name:		**Signature:**		**Date:**	
Comments:					

SAFETY AND HEALTH TOPIC SHEET NO. 22: BELIEF-BASED SAFETY: ATTITUDES AND COMPLACENCY

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Within IRATA we are taught from day one the importance of health and safety within our industry. We are taught about the safety of the equipment and methods we use and the importance of our own personal safety, as well as the safety of the people we work with and those affected by our works.

1.2 Although we work in an industry which we consider to be very safe, it can be our *attitudes* that negatively affect the way we carry out our work.

1.3 There are many documents and initiatives that detail methods to improve our behaviours and attitudes to safety (see **11**, Further reading). However, this topic sheet will address two issues which may affect safety within rope access:

- attitude; and
- complacency.

1.4 Examples are given in the following case studies:

2 CASE STUDY 1

Shaping attitude to safety
Whilst carrying out a simple visual inspection, a team of rope access technicians had to abseil down the inside face of a louvered façade. The drops were approximately 50 metres and the ropes passed down the inside face, near to the louvres and the internal mesh surrounding the building. The Level 1 technician noticed the proximity of the rope to the polycarbonate louvre edge and asked the Level 3 whether rope protection was needed. The Level 3 responded by saying that rope protection wasn't needed; but that if he wanted some 'it was on the shelf under the floral print dresses'. This comment was meant as a joke, but also inferred that using edge protection was not only unnecessary but also not "macho" ('not the done thing').

3 WHY THINGS CAN GO WRONG …

3.1 The drops had been checked previously and edge protection was not required. The response from the Level 3 technician was intended as a joke, but what are the potential effects of this type of response?

- The Level 1 may not now be confident to question the need for edge protection in the future, with potentially dire consequences.

- The response may encourage technicians to take risks and not give due consideration to potential hazards.
- The response may discourage technicians from questioning their supervisor, not just on safety topics but also any other issues
- The response not only makes the supervisor un-approachable but also un-questionable.

4 WHAT YOU CAN DO AND HOW TO DO IT …

4.1 Many rope access teams are small and close knit. As a result, there is a tendency for key safety issues to go undiscussed after the initial briefing of the method statement and risk assessment (RAMS). This is not only problematic for new and inexperienced team members but, in emergency situations for example, everyone should know what they are doing and what their role is. A rescue plan will be ineffective if all those involved are running around not knowing what needs doing.

4.2 Comments made between team members who have known each other some time, and have a close working relationship, will have a different effect to those made between relative strangers. In the latter case, the rope access safety supervisor should take the time to explain why rope protection is not required. A positive attitude to safety can be reinforced through discussion. It is important also to remember that those with less experience are still able spot things that may have been missed.

4.3 Our attitude to safety and behaviours help to keep us safe but help also in promoting rope access as a professional industry and a safe system of work.

5 CASE STUDY 2

Complacency
An experienced rope access technician had spent the day carrying out glazing works on a 75 metre high tower block. The job was technical, involving complex rigging and heavy loads. At the end of the day the technician descended to the lowest balcony, at approximately five metres above the ground. They didn't have sufficient rope available to step safely inside the barrier at the door, without detaching from the ropes. When 3 metres away from the unguarded edge they detached themselves, walked to the door and entered through the barrier. The technician was seen by the site manager walking unprotected near an edge. This resulted in the individual, and the company, being removed from site.

6 WHY THINGS CAN GO WRONG …

6.1 The technician had been safely carrying out complex work all day, at high level. When it came to the end of the day, the simplest thing was to break the rules. The technician did not consider it unsafe; he was clear of the unguarded edge and the potential for a fall was unlikely.

6.2 Rope access technicians working at height have good working practices when undertaking their work. However, familiarity with working safely at height may lead to complacency at lower levels. Falling 5 metres can have the same outcome as falling 75 metres.

6.3 A high level of understanding regarding the dangers of working at height, does not make a technician invincible or above the site rules.

7 WHAT YOU CAN DO AND HOW TO DO IT …

7.1 Lead by example. Treat all work at height with the same respect, whether 3 metres or 300 metres. Remember the old saying, "It's not the fall that kills you, it's the sudden stop at the bottom".

7.2 Take few moments to check your environment before you start. Checking ropes and equipment before a drop over an edge is largely routine to a rope access technician, so apply this thinking to all activities which present a risk. Accidents can be avoided by carrying out a quick check before you commence working. Think, "What's different today?".

7.3 Remember, not all health and safety incidents result in an accident but this does not make them any the more acceptable.

7.4 Supervisors should not adopt an attitude of "Do as I say and not as I do". This is not acceptable. Supervisors should adopt and encourage safe practices; and not use experience as an excuse to cut corners. The way you conduct yourself as a supervisor will influence those who go on to be supervisor.

7.5 Remember, you are not on site for people to look at and think, "That looks dangerous and exciting". You are there to undertake a task and to demonstrate that it can be achieved safely using rope access.

7.6 The way you conduct yourself on site effects the way our industry is perceived.

8 ADDITIONAL CONSIDERATIONS

8.1 There are many factors that may affect the safety of rope access technicians.

8.2 This topic sheet is to encourage discussion of the 'soft' issues (rather than technical); importantly, attitude and complacency.

8.3 Many people view health and safety as a delay to getting the job done, at best a "necessary evil". In many cases those undertaking rope access work have a better understanding of the associated risks and hazards than those employing them. Take this as an opportunity to share your knowledge and promote the industry.

9 ACTION

9.1 Discuss with your colleagues the 'safety culture' in your organisation. What can you do to improve it? What goes wrong?

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

10 RECORD FORM

10.1 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.

11 FURTHER READING

Promoting a positive culture, A guide to health and safety culture[1]

Human factors and ergonomics, HSE[2]
Human factors: Behavioural safety approaches - an introduction (also known as behaviour modification)[3]

Learning from accidents, Kletz, T. (2001), Butterworth-Heinemann Ltd, Oxford, ISBN 0 7506 4883 X

A review of safety culture and safety climate literature for the development of the safety culture inspection toolkit, HSE Research Report 367[4]

Leadership and worker involvement toolkit, HSE[5]

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1 https://www.iosh.co.uk/~/media/Documents/Promoting%20a%20positive%20cultureconnect.pdf?la=en
2 https://www.hse.gov.uk/humanfactors/index.htm
3 https://www.hse.gov.uk/humanfactors/topics/behaviouralintor.htm
4 www.hse.gov.uk/research/rrpdf/rr367.pdf
5 www.hse.gov.uk/construction/lwit/index.htm

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 22: Belief-based safety: attitudes & complacency	
Reason for talk:			
Start time:		**Finish time:**	
Attended by *Please sign to verify understanding of briefing*			
Print name:		**Signature:**	
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Matters raised by employees:		**Action taken as a result:**	
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Comments:					

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SAFETY AND HEALTH TOPIC SHEET NO. 23: ACCIDENT AND INCIDENT REPORTING

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION

1.1 Workplace health and safety regulators are committed to preventing work-related deaths and injuries. Apart from being a legal requirement, notifying the regulator of "reportable accidents" can help identify the underlying causes and prevent similar occurrences in the future, including in your own workplace.

1.2 Each country has its own legal requirements and all IRATA member companies should have a procedure for the reporting of accidents, etc. (as appropriate). The reporting of accidents and dangerous occurrences is also a requirement of IRATA membership.

1.3 In broad terms, a "reportable accident" is:

- the death of a person;
- a serious injury, e.g. a fracture, loss of consciousness, etc.;
- incapacitation, e.g. injured and away from work for over 7-days;
- some occupational diseases, e.g. hand arm vibration syndrome; or
- certain dangerous occurrences.

1.4 A reportable accident may relate to any person; whether an employee, contractor or member of the public.

1.5 Your company's 'responsible person' must notify the enforcing authority without delay, in accordance with local reporting requirements. Sometimes, this may be done online. Alternatively, in particular for fatal accidents or serious injuries, a contact number is normally available. Typically, the company is required to report an accident within 10 days of its occurrence.

1.6 It is essential also that work and safety statistics be completed and submitted to IRATA International quarterly. This should be undertaken promptly and is an auditable item.

1.7 All accidents and incidents (including dangerous occurrences) should be reported to IRATA within 7 days (Form 021).

NOTE:
For a 'serious incidents' – a fatality, major injury or over 7-day injury - see MP-255ENG, Serious incident procedure.

1.8 The statistics gathered from this information are used in the annual IRATA International 'Work and Safety Analysis' (WASA) to highlight the industry's safety record and opportunities for continual improvement.

2 WHAT CAN GO WRONG …

2.1 Accidents and incidents can reoccur if nothing is done to change the circumstances and/or equipment that led to the event.

2.2 Near misses can escalate to become accidents and incidents.

2.3 Injuries or illness may manifest at a later date, resulting in loss of support or compensation to the injured person (e.g. Workers Compensation Insurance Australia).

2.4 Incidents not reported may lead to damage to the reputation of the company involved and the wider rope access industry.

3 WHY THINGS CAN GO WRONG …

3.1 Not reporting accidents may occur for a number of reasons:

- Lack of awareness;
- Complacency;
- Poor safety culture.

3.2 If they are not recorded (and reported, where necessary):

- Lessons are not learned;
- Evidence of the cause can be lost.

3.3 The consequence is that:

- Further accidents or incidents or may occur;
- Near misses can escalate to become accidents;
- Injuries can become worse over time;
- Companies and/or persons may be prosecuted.

4 WHAT YOU CAN DO …

4.1 Report all accidents, incidents or near misses.

4.2 Know and follow your company's reporting procedure.

4.3 Support and encourage fellow workers to report all accidents, incidents or near misses, no matter how seemingly insignificant.

4.4 If you are not sure, speak to your line manager.

"… If you see a risk that others take, that puts their health or life at stake. The question asked, or thing you say, could help them live another day …"

5 HOW YOU CAN DO IT …

5.1 You can:

- Speak up;
- Follow company procedures;
- Report immediately after the incident or near miss.

6 ACTION

6.1 Review your management system's procedures for accident and incident reporting.

7 REFERENCES

7.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:
- Part 2, 2.11.12, Reporting of incidents and accidents
- Part 4, 4.2.11, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (UK)

(b) Training, Assessment and Certification Scheme (TACS) for personnel engaged in industrial rope access methods (Edition 3.1, October 2015)[2]:
- 6.2.2, Legal framework

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

8 RECORD FORM

8.1 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.

9 FURTHER READING

Reporting accidents and incidents at work, A brief guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)[3]
The model Work Health and Safety Act and Regulations, Australia[4]
WorkSafe Western Australia, Occupational Health and Safety Act and Regulation[5]
WorkSafe Victoria Occupational Health and Safety Act/Regulation[6]

1 https://irata.org/downloads/2055
2 https://irata.org/downloads/2059
3 http://www.hse.gov.uk/pubns/indg453.pdf
4 https://www.safeworkaustralia.gov.au/doc/model-whs-regulations
5 https://www.commerce.wa.gov.au/worksafe/occupational-safety-and-health-act-and-regulations
6 https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations

I chose to look the other way

I could have saved a life that day,
But I chose to look the other way.
It wasn't that I didn't care,
I had the time, and I was there.
But I didn't want to seem a fool,
Or argue over a safety rule.

I knew he'd done the job before,
If I spoke up, he might get sore.
The chances didn't seem that bad,
I'd done the same, He knew I had.
So I shook my head and walked on by,
He knew the risks as well as I.

He took the chance, I closed an eye,
And with that act, I let him die.
I could have saved a life that day,
But I chose to look the other way.
Now every time I see his wife,
I'll know, I should have saved his life.

That guilt is something I must bear,
But it isn't something you need share.
If you see a risk that others take,
That puts their health or life at stake.
The question asked, or thing you say,
Could help them live another day.

If you see a risk and walk away,
Then hope you never have to say,
I could have saved a life that day,
But I chose, to look the other way.

Don Merrell

Message from Don Merrell:
Thank you for your interest in my poem. I appreciate hearing that it is being used to help keep people safe. Feel free to use the poem in any way to promote safety and to share it with anyone who might find it of interest or use. I ask only that the poem stay intact and my name and contact information remain with it.

Don Merrell, J.R. Simplot Co.
P.O. Box 912, Pocatello, Idaho, 83204

IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM			
Site:			
Date:			
Topic(s) for discussion:		Topic Sheet No. 23: Accident and incident reporting	
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:					

SAFETY AND HEALTH TOPIC SHEET NO. 27: NEAR MISS AND UNDER REPORTING

A safety and health 'topic sheet' aimed at raising awareness of hazards in the rope access industry. The series may be of use as a toolbox talk.

1 INTRODUCTION …

1.1 A near-miss causes no immediate harm, but can precede events in which a loss or injury could occur.

1.2 Definitions vary. For example, the US National Safety Council defined a near-miss as:

"An unplanned event that did not result in injury, illness or damage – but had the potential to do so"

1.3 Members are encouraged to implement a robust near-miss reporting system as an opportunity to prevent future incidents, rather than waiting for losses to occur before taking steps to prevent them from occurring.

1.4 This requires worker consultation – and an understanding by all of why it is important.

2 IRATA – REPORTING REQUIREMENTS

2.1 Within IRATA, there is a requirement on members to report a 'dangerous occurrence'. This is defined as:

"Any event where no injury occurred, but which may have caused injury or death"

2.2 If an event did not have the potential to cause injury (or a fatality) it should not be reported as a dangerous occurrence.

2.3 NOTE: A decision not to commence work due to bad weather is not reportable as a dangerous occurrence; whereas the urgent need to abandon work due to unforeseen severe weather would, if injury might have occurred, be reportable.

2.4 In summary, there must have been <u>no</u> actual injury but there must have been potential for injury.

3 EXAMPLES OF SOME NEAR-MISSES

3.1 Examples of a range of reported near-misses include:

Case Study (1)
While changing bolts on a turbine nacelle, during a bolt tightening task, the removable head of the wrench and 13mm socket dropped into sea (within the exclusion zone). The tools were supplied by the customer. There was no method of secondary retention to the wrench handle of the removable head. Staff immediately stopped work and reported incident.

Case Study (2)
A rope access technician was installing insulation on the ejector using bands to hold the acoustic barrier in place. As they were cutting the banding with their snips, the knot on the banding tool came loose causing the tool to fall approximately 60 feet onto a mezzanine deck below.

Case Study (3)
A technician dropped a calibration test tool that was on a tool lanyard. The lanyard had snagged on their descent device. This resulted in the tool becoming detached. The tool should have been in a tool bag and not left hanging during the descent.

Case Study (4)
While walking to their lunch break, a technician stepped on a small chamber cover (30 cm by 30 cm and 20 cm deep) that was loose. They stepped through, with no injury. However, an injury might easily have resulted, e.g. strained or broken ankle.

Case Study (5)
A connector was dropped from the fifth floor landing onto a canopy below. The connector became disconnected from the tether during a changeover as the tether's loop slipped through the connector's opening, without the technician noticing.

Case Study (6)
While moving to another location on the worksite, a needle gun slipped from the technician's hand. It hit the steelwork and snapped, with the body of gun falling into the sea. The needle gun hose was attached to a 'cowstail'.

Case Study (7)
A technician was working on a mooring dolphin undertaking coating remediation. A crane barge was operating in the same location. The technician was repositioning using his descender, and descended below his hand ascender, until it was out of reach. If the sea conditions had of changed there would have been a potential situation where there could have been an interaction between the crane and the technician.

Case Study (8)
Glider clamps fell to sea. The clamp had been placed on top of a flat-topped tank. Whilst climbing off the tank the clamp snagged on the harness and, due to the lightness of the clamp and the gear carried on the harness, it wasn't possible to feel the clamp snagging. All attention was on foot placement to climb down on to the deck and the clamp movement wasn't noticed. There was a small gap between the tank and the walkway handrails and clamp fell to the sea.

4 IRATA – WORK AND SAFETY ANALYSIS (WASA) …

4.1 The statistics gathered using **Form 021** are used in the annual IRATA International 'Work and Safety Analysis' (WASA) to highlight the industry's safety record and opportunities for continual improvement.

4.2 The information is also used by IRATA's Health and Safety Committee (HSC) to determine whether there is a need to publish a Safety Bulletin and/or Topic Sheet.

5 WHAT IS THE PROBLEM …

5.1 Accidents and incidents can reoccur if nothing is done to change the circumstances and/or equipment that led to the event.

5.2 Within IRATA, there has been a view - for a number of years - that the number of dangerous occurrences reported does not reflect what is actually happening on site.

5.3 The recommendations in WASA include the following:

2011

"The increasing trend to report dangerous occurrences should be encouraged, particularly when relevant to rope access."

2012

"Reporting dangerous occurrences should continue to be encouraged, particularly when relevant to rope access and providing they meet criteria (no actual injury, real threat of injury or fatality)."

2013

"Reporting dangerous occurrences should be encouraged, particularly when relevant to rope access."

2014

"Members should be reminded of the requirement to report all accidents and incidents, however trivial."

2016

"Repeatedly, members should be reminded of the requirement to report all accidents, incidents and events with potential to cause injury or fatality."

2017

"The low level of reported events, particularly 'dangerous occurrences', in relation to the overall employment level and hours worked, continues to be of concern."

2018

"It is recommended that the IRATA … encourage the membership to report not only injuries, but all incidents that could have led to injury of fatality, i.e. 'dangerous occurrences'."

2019

"Several areas of improvements over previously reported accidents and incidents were observed, particularly significant was the reduction in instances of rope damage."

2020

"The substantial increase in reporting in 2019 by members should be acknowledged."

5.4 Incidents not reported may lead to damage to the reputation of the company involved and the wider rope access industry.

6 WHAT YOU CAN DO …

6.1 Members – and RACs – are encouraged to engage in a discussion about the importance of near miss reporting.

6.2 Learning from failure (things that have gone wrong in the past) is vital. We should be learning from the small events, as much as the big events.

6.3 Should they be required, three 'toolbox talks' are provided - see **Annex A, B and C** - to assist in any discussion on near miss reporting (and the apparent trend to under-report).

6.4 Members may wish to use their own resources.

"… If you see a risk that others take, that puts their health or life at stake. The question(s) asked, or thing(s) you say, could help them live another day …"

7 ACTION

7.1 Review your management system for near miss and under reporting (and start a dialogue with your technicians and managers).

8 REFERENCES

8.1 Further information can be found in:

(a) IRATA International code of practice for industrial rope access (Third edition, September 2016)[1]:

- Part 2, 2.11.12.2

  "In addition to any legal requirements, an accurate record of all accidents or near-misses should be kept, including measures to avoid a reoccurrence. All employees should be encouraged to report near-misses …"

- Part 2, 2.11.12.3

  "It is essential that the IRATA International work and safety statistics be completed for all hours worked on rope, accidents, incidents or near misses and returned promptly to IRATA International when requested …"

8.2 For a list of current (and past) '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.

[1] https://irata.org/downloads/2055

10 FURTHER READING

IRATA Safety and health topic sheets:

- No. 2 Near misses: learning from failure
- No. 3 Avoiding dropped back-up devices
- No. 5 Safe rigging of rope access equipment
- No. 12 Hazard identification and risk assessment
- No. 22 Belief-based safety: attitudes and complacency
- No. 23 Accident and incident reporting

ANNEX A

1. Discuss

1.1 Discuss the following questions:

(a) Why should rope access technicians and/or IRATA member companies report accidents and near misses?

(b) Why don't rope access technicians report accidents and near misses (or member companies, for that matter)?

1.2 Document your responses – and then decide what you are going to do (as individual technicians and member companies).

2. Plan

2.1 Draw up an action plan and monitor it periodically.

3. Auditing

3.1 An IRATA Auditor may ask you about your plans for continuous improvement. This action plan will help but, more importantly, it will go some way to ensuring that you and your colleagues go home safely at the end of each day.

4. Supporting information

4.1 If leading a discussion, here are some responses provided by others:

(a) Why should people and/or companies report accidents and near misses?

- It is sometimes a legal requirement.
- To investigate serious incidents:
  - The data helps in undertaking a thorough investigation.
  - Hazards are addressed and how risks arise investigated.
- So that further advice can be provided.
- To provide an evidence-base for new legislation and/or guidance and/or procedures:
  - Review, including RAMS (Risk assessment and method statement).
- It is good practice to learn from accidents and incidents:
  - We learn from our mistakes.
- Prevention is better than cure:
  - Eliminate similar events from happening.
  - Ensures that risk is managed.
- Protect workers from harm.
  - They are protected and can go home safely.

- Accidents are detrimental to an organisation.
- Near-misses cause no immediate harm, but they often precede such events.
- The data provides a leading indicator (if collected and used properly).
- Putting something in writing means that there is a greater chance the issue will be resolved.

(b) Why don’t people report accidents and near misses (or companies, for that matter)?

- They don’t believe that what they witnessed is significant.
- It’s not worth the time investigating it.
- They didn’t think anyone would actually be injured.
- It’s not a macho thing to do.
- The belief that IRATA might withdraw my membership
- They don’t believe that the information will be treated confidentially.
- They feel very uneasy about speaking up
  - Don’t like conflict
- They are too busy
  - Don’t have the time
- They will get tied up in paperwork
  - Will then be under pressure to catch up
- It’s not what we do round here
  - Don’t really care
- The hazard may not have been identified
  - Lack of training
- Nothing will happen
  - It’s all about speed and profit
- There is no commitment from management
  - Management doesn’t care
- It’s a blame game
  - I’ll lose my job
- They feel intimidated

ANNEX B

1. Discuss

1.1 Discuss the following questions:

What could happen if incident reporting is:

(a) not done?

(b) not done well?

(c) not followed up?

(d) not recorded?

(e) followed up but outcomes are not communicated?

1.2 Document your responses – and then decide what you are going to do (as individual technicians and member companies).

2. Plan

2.1 Draw up an action plan and monitor it periodically.

3. Auditing

3.1 An IRATA Auditor may ask you about your plans for continuous improvement. This action plan will help but, most importantly, it will go some way to ensuring that you and your colleagues go home safely at the end of each day.

NOTE:
Risk assessment is a process. It is a means to an end (the elimination or mitigation of risk) and not the end itself (a piece of paper).

4. Supporting information

4.1 If leading a discussion, here are some responses provided by others:

What could happen if incident reporting is …

(a) … not done?

- The hazard(s) may not have been identified.
- Incorrect assumptions may be made about exposure to the hazard and any associated risks.
- Risk assessments may be flawed because the process has not included all the knowledge for the workplace or an activity.
- The outcome for the next technician may not be so favourable.

(b) … not done well?

- Risk assessments may not be 'suitable and sufficient'.
- Control measures may be ineffective because they are based on insufficient or incorrect information.

(c) … not followed up?

- If there is no remedial action, there remains exposure to the hazard.
- Technicians stop reporting because they think it is a waste of time when nothing happens.
- Equipment manufacturers will not be aware that there is a problem, so how will they know to recall or redesign their product(s)?

(d) … not recorded?

- Loss of on-the-job knowledge
- No opportunity to identify trends or clusters of incidents over time (i.e. lessons learnt can be lost).

(e) … followed up but outcomes are not communicated?

- Technicians may not know there have been changes in the safety system and that they need to modify their work practices
- A lack of positive reinforcement decreases the value of reporting.

ANNEX C

1. Discuss

1.1 Discuss the following question:

Most workplaces don't have an effective reporting culture for many reasons. Why don't technicians report near-misses?

1.2 Document your responses – and then decide what you are going to do (as individual technicians and member companies).

2. Plan

2.1 Draw up an action plan and monitor it periodically.

3. Auditing

3.1 An IRATA Auditor may ask you about your plans for continuous improvement. This action plan will help but, most importantly, it will go some way to ensuring that you and your colleagues go home safely at the end of each day.

4. Supporting information

4.1 If leading a discussion, here are some responses provided by others:

Most workplaces don't have an effective reporting culture for many reasons. Why don't workers report?

a). Technicians don't know that they should report things.

- Employer health and safety policies are unclear.
- Supervisors and technicians are not taught about their obligations.
- Technicians are told that it's not reportable.
- Workers may make a claim for an injury.

b). Technicians don't know how to report.

- Forms are not available.
- Technicians aren't trained or informed on the workplace health and safety policies and practices.

c). Technicians are afraid to report.

- The employer intimidates them from reporting hazards and/or coerces them into not claiming a benefit
- The employer blames workers for accidents instead of taking corrective action to solve the problem at the source.
- The employer claims economic hardships as a result of addressing safety concerns.

d). Technicians don't feel that there is any point in reporting.

- Management won't engage in worker consultation and involvement activities.
- Hazards are never addressed.

e). Technicians don't have time to do it.

- Teams are understaffed.
- Work assignments are overloaded.
- Shifts are not backfilled.
- Support is not available from supervisors.

Topic Sheet No. 27
Near miss and under reporting

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<tr><td colspan="2">Topic(s) for discussion:</td><td colspan="2">Topic Sheet No. 27:
Near miss and under reporting</td></tr>
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Please sign to verify understanding of briefing</td></tr>
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<tr><td colspan="4">Briefing leader
I confirm I have delivered this briefing and have questioned those attending on the topic discussed.</td></tr>
</table>

Print name:		**Signature:**		**Date:**	
Comments:					

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:

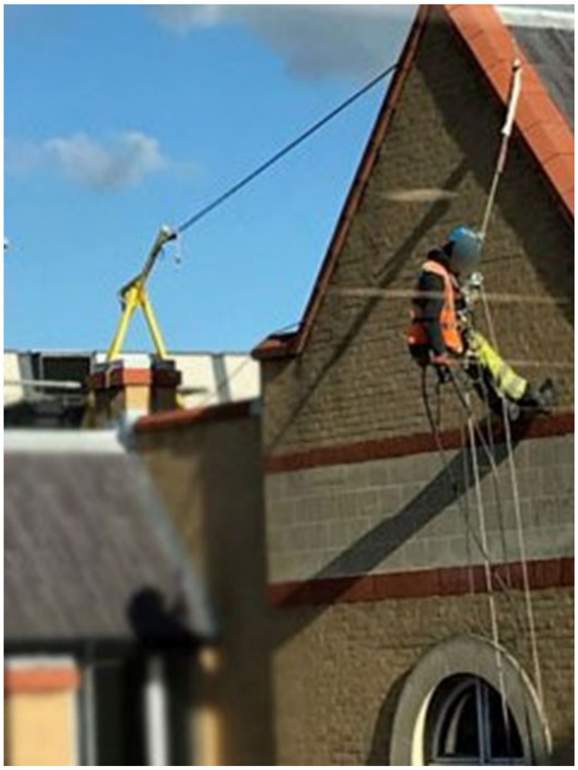
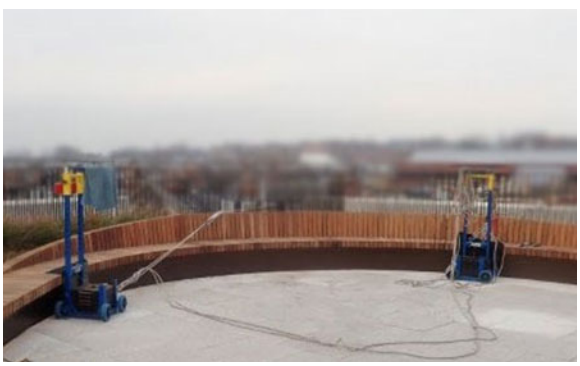


Figure 1 *- Use of a placed anchor device outside the manufacturer's instructions. Poorly assessed deviation and rope protection. Rescue complexities.*

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.

<table>
<tr><th colspan="4">IRATA SAFETY AND HEALTH TOPIC SHEET – RECORD FORM</th></tr>
<tr><td colspan="2">Site</td><td colspan="2"></td></tr>
<tr><td colspan="2">Date</td><td colspan="2"></td></tr>
<tr><td colspan="2">Topic(s) for discussion</td><td colspan="2">Topic Sheet No. 28:
Misuse of anchors</td></tr>
<tr><td colspan="2">Reason for talk</td><td colspan="2"></td></tr>
<tr><td>Start time</td><td></td><td>Finish time</td><td></td></tr>
<tr><td colspan="4">Attended by
Please sign to verify understanding of briefing</td></tr>
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<tr><td colspan="2">Matters raised by employees</td><td colspan="2">Action taken as a result</td></tr>
<tr><td colspan="2"></td><td colspan="2"></td></tr>
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<tr><td colspan="4">Continue overleaf (where necessary)</td></tr>
<tr><td colspan="4">Briefing leader
I confirm I have delivered this briefing and have questioned those attending on the topic discussed.</td></tr>
</table>

Print name		**Signature**		**Date**	
Comments					