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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

3.4 **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/wp-content/uploads/2016/05/FASET-Good-Practice-Revision-1.pdf (FASET)

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 3.4);

(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]:

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

- 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 and Health Topic Sheet: 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. 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:					