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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 not 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 accidentally 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.

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- 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 all 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.  
NOTE: 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

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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<sup>1</sup> 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.

<sup>1</sup> Such as the IRATA ICOP and 'Edge Management Poster'

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### 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)<sup>2</sup>:
  - o Part 2, 2.11.2, The anchor system (anchors and anchor lines)
  - o 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 (Edition 3.1, October 2015)<sup>3</sup>
  - o 6.4, Rigging
  - o 6.5, Rigging for rescue and hauling

- 7.2 For a list of current (and past) 'safety communications' by IRATA, see [www.irata.org.uk](http://www.irata.org.uk)

### 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<sup>4</sup>

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<sup>2</sup> [www.irata.org/default.php?cmd=215&doc\\_id=4336](http://www.irata.org/default.php?cmd=215&doc_id=4336)  
<sup>3</sup> [www.irata.org/default.php?cmd=215&doc\\_id=4193](http://www.irata.org/default.php?cmd=215&doc_id=4193)  
<sup>4</sup> <http://nsl.ascoworld.com/services/safety-products/handbooks>

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<b>Site:</b>			
<b>Date:</b>			
<b>Topic(s) for discussion:</b>		Topic Sheet No. 5: Safe rigging of rope access equipment	
<b>Reason for talk:</b>			
<b>Start time:</b>		<b>Finish time:</b>	
<b>Attended by</b> <i>Please sign to verify understanding of briefing</i>			
<b>Print name:</b>		<b>Signature:</b>	
<i>Continue overleaf (where necessary)</i>			
<b>Matters raised by employees:</b>		<b>Action taken as a result:</b>	
<i>Continue overleaf (where necessary)</i>			
<b>Briefing leader</b> <i>I confirm I have delivered this briefing and have questioned those attending on the topic discussed.</i>			
<b>Print name:</b>		<b>Signature:</b>	
			<b>Date:</b>
<b>Comments:</b>			