Rope Access - Case Studies
Presented at the 7th Annual Hazardous Area Conference 2018

Abstract

Falls from height are a major cause of death and serious injury in Australia especially in the construction industries. Reports produced by SafeWork Australia indicates 26 workers died and 6800 incident claims recorded for serious injury due to falls from height in 2014-2015. Rope Access provides alternative means of access and is considered as one of the safest forms of working at height. With adequate training, fit for purpose equipment and correct implementation, potential risks in working at height can be significantly reduced. This paper will discuss about Rope Access training, equipment, accreditation/training and its role in offshore Oil & Gas facilities.

Introduction

In every Oil & Gas facility, there are electrical equipment placed in areas which are considered 'difficult to access', whether it's on a vessel, crane, flare towers or pipe bridge. Generally working at height using special access equipment will be required to provide direct access to this equipment. However, in some cases, the erection of access equipment may not be possible, leading to the requirement of rope access technicians.

Rope Access – Personnel, Training and IRATA Accreditation

Rope Access is a safe method of working at height based on work positioning where ropes and associated equipment area used to gain access to and from the work position and to be supported from there.

It allows workers to access difficult to reach locations without the need for special access equipment such as scaffolding, fixed or mobile work platform. Similar to other methods of working at height, application of rope access includes proper planning, management, selection and fit-for-purpose equipment and competence to ensure a safe system of work.

IRATA (Industrial Rope Access Trade Association), one of the internationally recognized rope access association, have been developing safe work procedures and

guidelines for rope access named IRATA International Code of Practice (ICoP) since its inception in late 1980's. Members of IRATA are audited regularly to confirm that the rope access work meets the guidelines and code of practice.

In Australia, the following standards are relevant to the implementation of rope access work:

- AS/NZS 4488.1: Industrial rope access systems: Part 1: Specifications
- AS/NZS 4488.2: Industrial rope access systems, Part 2: Selection, use and maintenance
- ISO 22846.1: Personal equipment for protection against falls - Rope access systems - Part 1: Fundamental principles for a system of work
- ISO 22846.2: Personal equipment for protection against falls - Rope access systems - Part 2: Code of practice

There are three levels of competencies for Rope Access:

- Level 1 Rope Access - Beginner
  This is the entry level into rope access. Level 1 technician will be able to perform a limited range of rope access task under supervision of an IRATA approved Level 3 safety supervisor. Certification as Level 1 is valid for three years.

- Level 2 Rope Access - Intermediate
  Level 2 technician will be capable of rigging working ropes, undertaking rescues and performing rope access tasks under the supervision of an IRATA approved Level 3 Supervisors.
  To apply and qualify for level 2, a level 1 technician must log at least 1000 rope access hours and work for a minimum of 1 year.

- Level 3 Rope Access - Safety Supervisor
  Level 3 safety supervisor holds overall responsibility for work projects as well as supervision of Level 1 and 2 rope access. A safety supervisor is expected to be conversant with relevant work techniques & legislation, and to have comprehensive knowledge of advanced rescue techniques.
  To apply and qualify for level 3, a level 2 technician must log at least 1000 rope access hours and work as level 2 for a minimum of 1 year.

Rope access technicians generally work in a team of two or more, one of which must include a Level 3 safety supervisor. No Rope Access work is to be performed on any site where there is no adequate supervision by an IRATA Level 3 Safety Supervisor. Level 3 Supervisors are to be briefed on the type of equipment to be used and training will be given to familiarize all technicians with the equipment and documented records are to be maintained.

Rope Access - Equipment

Rope access equipment must conform to relevant national and international standards. Prior to use, each item must be inspected to ensure that it is in safe condition and operates correctly.

Rope access equipment consists of the following:

- Full Body Harness
- Work Seat
- Connectors (Karabiners) & Maillon Rapide
- Rope Adjustment Devices (Descenders and Ascenders)
  Descenders are manually operated, friction inducing, rope adjustment device, which when attached to an anchor line of appropriate type and diameter, allows the user to achieve a controlled descent and to stop with hands off anywhere on the anchor line.
  Ascenders is a rope adjustment device which, when attached to an anchor line of appropriate type and diameter, locks under load in one direction and slides freely in the opposite direction.
- Rope Adjustment Backup Device
  Device attached to a safety line of appropriate type and diameter, which accompanies the user during changes of position or allows adjustment of the length of the safety line, and which locks automatically to the safety line, or only allows gradual movement along it, when a sudden load is applied
- Ropes (Low Stretch Rope and Cow's Tails/Lanyards)

Rope Access – Implementation

Rope access procedure includes the use of twin ropes and two point of contacts. Second "safety" rope will act as a back up to the primary "working" rope in the event of a failure or damage.

The ropes are anchored onto suitable fixed structures with a minimum rating of 16KN allowing the operator to move around freely underneath. In some cases, the ropes may be attached to multiple anchor points to minimize the risk of a single point failure.

Once the ropes are secured and in place, the technician will be able to ascend and descend vertically and horizontally with the use of rope adjustment device.

On all work sites, the team will be supervised by a level 3 who will be trained in advanced rescue techniques. All work scopes will be planned and a in depth rescue plan/method statement will be formulated this will consider the scope and type of rescue required the number of personnel that will be needed to ensure a safe and sufficient rescue.

As No two rescue scenarios are the same, Level 3's are highly experienced in their field and can call upon their industry knowledge and skills when planning work scopes to ensure this work is completed as safe as possible.

When works scopes are being undertaken, it is key that all rope access technicians are fully briefed and aware of their roles. The level 3 will be constantly reviewing the work scope to ensure he is fully aware of any hazards that maybe become introduced to the work scope either by his technicians or a third party. If he feels that the something has

changed, he will stop the job and have job site reviewed with the entire team before proceeding.

This vigilance, experience and training are what makes Rope Access one of the most relied upon and safest means of access in the industry today.

Rope Access – Advantages

The following are some of advantages Rope Access offer

- Access to difficult and narrow locations
- Self-sufficient.
- Minimal impact on other operations, surrounding areas and the environment
- No downtime waiting for access equipment.
- Versatile workforce – can be the 'ground' team and 'working-at-height' team
- Reduced SIMOPS in high risk areas due to less equipment involved
- Reduced manning/POB 'Personnel on Board' – the reduction of the combination of the total man-hours and perceived level of risk for a particular task (man-at-risk hours) when compared with other means of access and their associated risks and costs.
- Reduced cost and time - minimal set up and dismantle compared to scaffolding.

Case Study 1: Crane Boom Ex Lighting Installation

Objective:
Repair/replace light fittings on offshore rig's crane boom.

Issue:
Traditionally, scaffolding would provide a safe and stable platform for worker, however considering limited mobility as well as locations of each light fitting, this type of access would not be a time and cost-effective solution. Access to the equipment will require a scaffold to be built for each light fitting. It would take 3 scaffolders and a total of 28 man-hours to erect and dismantle each scaffold.

Solution:
Rope access EEHA inlecs were selected for this application, as it would enable worker to reach each light fitting, providing the flexibility to move around the structure. It also provides a very cost and time effective solution as there's no longer a requirement to mobilize and demobilise 3 scaffolders offshore.

A team of only two rope access EEHA inlecs is required for the project. Rope systems can safely be rigged within an hour. Installation and initial detailed inspection can be completed by the technician whilst on ropes.

Crane Boom Lighting Installation (Per fitting)	Scaffolding	Rope Access	Savings
Number of People Required	3	2	1
Total Man hours	28	4	24

Case Study 2: Gas Monitor Installation/Upgrade

Objective:
Improvement notice issued by regulator for insufficient fire and gas detection on an offshore installation. New fire and gas detection units will need to be installed in several locations and new cables are run from the fire gas panel to each field device.

Issue:
Access to the equipment will require a scaffold to be built for each device as well as for whole cable run required. It would take 4 scaffolders and a total of 75 man-hours to assemble and disassemble scaffold.

Solution:
Rope Access EEHA Inlecs were selected to upgrade fire and gas detection unit, including running of cables through multiple levels from panel to each device. As the result, 22% reduction in total project execution cost totalling over 80k savings and over 16 man days reduced throughout the project cycle.

Gas Monitor Replacement (Per device)	Scaffolding	Rope Access	Savings
Number of People Required	4	3	1
Total Man hours	75	12	63

Case Study 3: HA Inspection on high level lighting

Objective:
Inspect Ex light fittings located at heights in location such as crane, towers, edge of the rigs/structures.

Issue:
Electrical equipment and installations located within the explosive atmospheres must be inspected on regular basis to ensure the integrity of Ex protection afforded to each Ex equipment is preserved throughout. It is common to find that the equipment is located at height and in difficult to reach locations. This equipment is rarely inspected and maintained. It is often the case, they ended up being only visually inspected or not inspected at all.

Solution:
Rope access inlecs with EEHA competencies are used for this project. They can reach each equipment on ropes, performing close or detailed inspection, as well as any remediation/repair or re-lamping at the same time.

HA Inspection on High level Lighting (per light)	Scaffolding	Rope Access	Savings
Number of People Required	4	2	2
Total Man hours	52	8	44

Summary

Rope access in Australian have grown in recent years, showing consistent increases in work hours across the industry. In offshore Oil & Gas facilities, it has been proven to provide significant savings and advantages in working-at-height related projects, when compared to traditional scaffolding, especially when rope access EEHA inlecs are utilized. As one of the safest forms of working at height, it provides alternative means of access at a much smaller workforce and less man hours.

References

Safe Work Australia. Work-related injuries and fatalities involving a fall from height, Australia. Canberra (AU); 2013. 60 p.

IRATA website. https://irata.org/