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A+A 2017: Background Article on PPE: Fall Protection

Aiming high – and aiming safely

Working at high altitudes is considered to be extremely dangerous. Fire services, for instance, need to conduct safe rescue operations, yet they are by no means the only ones. Safe working conditions are equally vital for anyone working at solar or wind farms, in the forestry industry or at a brewery. Technical regulations are therefore in place, ensuring the provision of suitable equipment and training. The complete range of innovations in fall protection on the PPE market can soon be viewed at A+A, the world's leading trade fair and convention on occupational health and safety in Düsseldorf from 17 to 20 October 2017.

Transmission poles, bridge pylons, industrial stacks, giant trees, rescue operations in the mountains – it may well seem that the higher a person has to climb, the more they need to be protected from falling. Yet there is no need to aim quite so high. Even a fall from a relatively low height can lead to severe injuries or death. The same applies to depths, for example in a well. "Anywhere a person might need to enter and where they are then completely enclosed," says Klaus Bornack, President of Düsseldorf's A+A – the world's leading trade fair on personal equipment, corporate safety and safety at work – and Board member of IVPS, the German Association of Manufacturers of Personal Protective Equipment. "Take a brewery, for instance, where barrels need to be cleaned at regular intervals. Sadly, it keeps happening that an employee faints while performing such work. This may be because they're short of oxygen, or it may be because of toxic gases descending to the bottom of the barrel. Anyone rescuing them and letting themselves down into the barrel would then also faint." This makes it essential to use rescue equipment with proper fall protection where a person can be suspended in an upright position if they faint.

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In Germany alone, says Bornack, manufacturers are selling about EUR 1.8 billion worth of personal protection equipment. Alongside protective gloves, footwear and clothing, about 25% of the revenue comes from life-saving products, such as respiratory protection, fire protection and safety ropes as important equipment to keep down accident figures. Such products are based on technical standards and the accident prevention regulations set up by Germany's accident liability insurance associations, thus warranting compliance with minimum safety requirements. Moreover, thanks to EC directives, the regulations are applicable across borders, throughout Europe, and an important new element will be the upgrading of the former PPE directive 89/686/EEC to the level of an EC regulation from 2019.

Indispensable: training and seminars

Under the law, it is basically the job of each company's health and safety officer to ensure compliance with minimum standards. They therefore need to receive training as multipliers, so that they can be contacted about any questions that might arise and provide information and the necessary details about fall protection. A health and safety officer can demonstrate how to wear a belt or harness correctly, and they are also familiar with issues such as load safety. Furthermore, they are trained in the regular checking of PPE for operational reliability. Training in the checking and practical use of PPE is provided by companies such as Bornack (which has three training centres, including a large high-altitude facility in Marbach on the river Neckar), DWS Pohl, Edelrid, MAS and ABS Safety – all of them exhibitors at A+A 2017.

Training courses are indispensable for the proper use of protection equipment. Good equipment is essential, but the better a user is trained, the more they are protected. After all, any work on radio masts and bridge piers is risk-prone, and when a person is in danger and needs to be rescued, this can never be described as an everyday situation. Even professionals such as special command units, fire

services, the police and Germany's Border Protection Group 9 can reach their mental and physical limits. This makes it all the more important for such workers to receive regular training in handling special situations and therefore to attend courses held by suitable service providers. Anyone requiring rope access in their work needs to be fully familiar with their workplace. This is the only way for them to understand the risks and to take suitable precautions. Moreover, technology always has its limits – and the same is of course true for safety technology. A rope access worker needs to be made aware of both these circumstances through suitable courses and must be trained in the correct use of their equipment. "This means providing a realistic environment," says Bornack, "where they can learn to master high altitude situations – not just physically, but also mentally." A+A 2017 will feature a special show entitled "Safe Rescue Operations from Heights and Depths" with an impressive live glimpse of certain training situations. A large activity space will be set up in Hall 6 where the German Federal Agency for Technical Relief (THW) and the German Life Saving Organisation (DLRG) will demonstrate the rescuing of accident sufferers in extreme situations, using diving pools and indoor climbing facilities. The focus of this fascinating special show will be on the safety of helpers and appropriate personal protection equipment (e.g. fall protection).

If anyone feels unsure about the selection of a suitable training company and the relevant training courses or seminars, they can take their cue from the relevant standards. "To establish rope access as a legitimate working method in Germany, our members have decided to define a set of safety and training standards," says the German Industrial Rope Access Trade Association (FISAT) as it comments on its foundation. A similar focus is maintained by the Global Wind Organisation, an association of companies catering for the offshore market. This organisation, too, has formulated regulations for equipment and training content which are applicable throughout the EU. Another industrial rope access workers' organisation with certification as a

training facility is IRATA (Industrial Rope Access Trade Association). (See info box)

From an alpine world to a working environment

The history of fall protection at work is not as long as it might seem. Scaffolding is not always suitable as an access method, and a crane is often too expensive and cannot be set up everywhere. While the cost and benefit of construction projects were often still manageable, inspections and repairs – particularly in exposed places – increasingly required new and secure access options. According to the German Industrial Rope Access Trade Association (FISAT), the scope of the work originally covered maintenance and repairs of defective spires, sculptural architecture, certain high-altitude works of art, as well as offshore oil rigs and onshore wind farms. The association further explains: “Germany experienced an increase in public awareness about rope access work in 1995, with the shrouding of the Reichstag in Berlin: to realise the design of the artist couple Christo and Jeanne-Claude, over a hundred rope acess workers had to be employed. At the time, such work was still not generally permitted, but after long negotiations with the employers’ liability insurance association of the construction trade, a special licence was eventually issued for the art project.

“Initially this work had a lot in common with mountaineering, both in terms of the work itself and also the kind of people who performed it,” says Oliver Hirschfelder from Edelrid. Techniques were taken over and were enhanced in safety. They were then applied to activities where a workplace could only be accessed with the use of a rope.

Over the last ten to 15 years this has led beyond some of the typical applications for harnessed access, resulting in a major development towards a special user group now known as rope access workers or industrial climbers. Harnessed and suspended from a rope, a worker spends limited periods of time conducting certain simple activities, i.e. inspections, cleaning and low-level assembly work. Rope work is

especially suitable for areas on façades and machinery which are difficult to access. Although such work “on the rope” looks highly precarious, it is actually very safe and, according to IRATA and FISAT, has very low accident statistics. As well using a working rope that is continually weighed down by the person’s body weight, the worker is also secured by a second, independent safety rope.

Special developments for different industries

Fall protection generally covers individual PPE with ropes and harnesses and collective protection such as scaffolding and a safety net. Quite often, however, it is not possible to set up collective protection, making it indispensable to use customised safety ropes and to apply a professional approach to the issue. A number of global high-tech companies have become established as safety rope specialists, including the A+A exhibitors 3M, MSA and Honeywell. However, the world's leading trade fair for personal protection, corporate safety and safety at work features not only these major corporations, but also numerous medium-sized, often family-run specialist companies, such as Edelrid, Bornack, Ikar, Mittelmann, MAS and Zarges (a company that is also famous for its ladders). Edelrid, for example, is particularly represented at wind farms and in arboriculture: “It’s a strong and growing market,” says Hirschfelder, “as there is an increasing interest in safety on trees.”

Today’s safety rope industry uses new materials and state-of-the-art production processes. It is also technically creative and innovative. Working closely with users, experts at the various specialist companies endeavour to create solutions that are focused on their customers’ requirements. After all, workers in the mobile phone industry have different needs as they climb transmission poles compared with workers in the solar industry or at a brewery. One area that is clearly in a state of flux is the work of a fire fighter. Fire services are turning increasingly into “universal” rescue services as they often respond to emergency calls requesting rescue operations or technical assistance.

PPE products must be checked regularly for operational reliability. Wear and tear is caused not only by general use, but also by environmental impact. This may include acids, alkalis, sparks of fire and sunlight – influences which impact the material properties of personal protection equipment, making it essential to check and assess the state of the equipment at regular intervals. Proper storage can definitely have a positive impact on the lifetime of PPE. Plastic, for instance, should be kept dry, at room temperature, and should be protected from UV radiation. Based on experience values, the employers' liability insurance associations specify a lifetime of six to eight years for the straps of a full body harness or rescue harness. The recommended period for straps and ropes is four to six years. Once an accident has happened, the entire equipment must be replaced.

Risk of suspension trauma

EU regulation no. 2017/425 requires a further reduction of hazards after the equipment has actually been used and has prevented a fall. One reason is to avoid the risk of suspension trauma. The PPE must ensure that, after a fall, the user can be stabilised in a position where they can wait for the rescue. This is because any lengthy motionless state of suspension will obstruct the flow of blood and/or stop the reflux of blood from the person's legs. Such an obstruction may lead to suspension trauma which can cause circulatory shock with severe or even lethal consequences. Research by the University of Frankfurt has shown that the length of time that a person can survive unharmed while suspended in full body harness is usually no longer than half an hour. To reduce the time pressure a little, harnesses are now available with vein padding. The padded spacers on the leg straps around the veins effectively form a bridge that prevents constriction. Alternatively, it is possible to attach rolled-up foot loops to a harness, allowing the victim to stand and thus to avoid suspension trauma.

According to the German Social Accident Insurance Association (DGUV), 877,071 reportable occupational accidents occurred in Germany in 2016, of which 425 were fatal. There are no figures documenting the proportion of falls. DGUV emphasises, however, that the building industry, in particular, is increasingly using fall protection systems, especially in roofing, carpentry and work on scaffolding. “Although rope access work is increasing – a job which is highly risk-prone by its very nature – we are only seeing isolated accidents now,” says Bornack. This development is helped by industries such as wind power, mobile phones and arboriculture. All fall protection equipment suppliers confirm that their products are highly sustainable in terms of user safety. They unanimously agree that “working together with employers, we are doing our best to ensure that rope access workers are healthy and well when they return to their families.”

Up-to-date details of A+A 2017 and its exhibitors, e.g. fall protection suppliers, are available at www.aplusa.de.

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Info box:

Associations

FISAT is the German Industrial Rope Access Trade Association, covering all companies that deal commercially with the use of ropes at work and in rescue operations. Courses at levels 1 to 3 under FISAT standards are offered to rope access worker by training companies that operate on their own responsibility and which are economically independent of the association. FISAT was founded in 1995. // www.fisat.de

Certification as a training company is also provided by the Global Wind Organisation (GWO), which represents wind farm owners and turbine manufacturers. Its aim is to ensure accident-free work in this industry through common standards and safety training. GWO was founded in 2014 and is based in Denmark. // www.globalwindsafety.org

IRATA, the International Rope Access Trade Association, is nearly 30 years old now and therefore has the longest history. Its focus is on offshore projects in the oil and gas industries, though also in construction and nature. IRATA prides itself in its training courses and strict working guidelines which, it says, have helped towards an annual reduction in the number of accidents. IRATA teams have assisted on the Eiffel Tower, the London Eye and the Emirates Tower in Dubai. // www.irata.org

Legislation

In the European Union rope access work is specified in Regulation No. 2009/104/EC, implemented in Germany through the country's Industrial Safety Regulation (BetrSichV). Rope access work is only permitted "if the risk assessment shows that the relevant work can be carried out safely". According to DGUV 312-906, personal protection equipment must be serviced by professionals who have been "selected, trained and certified as experts in PPE used for the purpose of fall protection".

Health and safety regulation BGR 198/199 stipulates that fall protection equipment must be serviced at annual intervals.

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