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Gotcha!

Following on from last month's article on harnesses and lanyards, Ed Darwin looks at points to consider when rescuing those trapped at height and stresses the need for contingency planning.

When working at height it does not matter how safety conscious or well-trained you are there is always a risk, no matter how small, that something will go wrong and you will need to be rescued, either because you are stuck in a platform, or you have fallen and are left dangling in your harness.

EU Directive 2001/45/EC - the Temporary Work at Height Directive - (the Work At Height Regulations in the UK) places a legal obligation on employers to ensure that any work at height is properly planned. This includes planning for emergencies and rescue procedures which ensure that appropriate rescue equipment is in place or at least readily available. And yet this area is very often completely overlooked or ignored.

When it comes to planning emergency rescue procedures, all reasonably foreseeable circumstances should be considered. It is therefore important to take the time to work out what may be required if things go wrong. For example if using a very high boom lift, what happens if it breaks down? How practical is the machine's emergency descent system to use? If it uses an electrically powered auxiliary system, is it fully charged? How high can the local fire service reach if they are called out? If all else fails is an abseiling device of some sort available?

A rescue by its nature is carried out under extreme pressure, so extra consideration should be given to the demands placed upon those who have to carry it out, the training and equipment required, as well as how effective the rescue procedure is likely to be when everyone is under pressure and emotional. The key is to get the stranded person down safely, in the shortest time possible



- it is not acceptable to simply rely on the emergency services. Everyone involved with carrying out work at height - including those working on the ground in the immediate vicinity - should be fully versed with the rescue procedure and be capable of following it confidently should an incident occur.

Stranded in an aerial work platform

If stranded while working from an aerial work platform the machine's built-in emergency lowering system, usually located on the chassis, can usually be used to bring the platform

back down to ground level. It is important that employees are shown the different emergency lowering systems for the different makes, models and types of machines being used on site, as the systems on each can and do vary in terms of location and design. The emergency descent system on a scissor - or any type of vertical lift - is far simpler than on boom lifts, but everyone needs to know a) that the machine has one b) where it is and c) how it works. Boom lifts may use a combination of gravity and a hand pump or an auxiliary power system.

Their operation is rarely self-evident and often far from being user friendly. It is unusual for these systems to fail but they should be checked out every day before the machine is used, and any problems reported and a technician called to fix it.

In the case of an emergency descent system failing with people trapped in the air, a basket to basket rescue needs to be carefully considered, and might be best left to the emergency services, much depends on the state of those stranded.



A basket to basket rescue carried out in Southend, UK, due to an overload cut out

However when performing such a rescue the machine must be positioned without compromising the safety of those carrying out the rescue. The platforms of both lifts must be adjacent to each other, with as small a gap between them as possible. A second lanyard should be attached to the person being rescued before the transfer takes place and then the original detached once the new one is secure. Care must also be taken not to overload the rescue machine - which might involve making more than one trip to complete the rescue. Finally, should all of the above fail and no alternative is available, consideration should be given for the use of a controlled descent system or a crane basket rescue.

Suspension trauma

If a fall occurs and the user is wearing a harness and lanyard, the danger is far from over. Not only is there the problem of retrieving the dangling person, but there is also the added risk that they may suffer orthostatic intolerance or suspension trauma, as it is more commonly known, which occurs when a user is left suspended in a harness for too long. Blood accumulates in the veins (venous pooling) leading to the user becoming unconsciousness. While uncommon, depending on the nature of the fall and the length of time the user is immobile, the subsequent effects can result in death.

It is important to remember that if the suspended person is able to move or relieve the pressure points then the effects can be dramatically reduced. Devices such as suspension loops, can also help alleviate the effects, however it is possible that the person might be unconscious or in shock, rendering them ineffective. ZT Safety Systems' zero trauma harnesses takes a completely different approach and eliminates the use of groin straps, using calf gaiters instead, to pull the legs into a



Gordon Leicester demonstrating the ZT Safety Systems ZT harness



Suspension loops can be used to alleviate the effects of suspension trauma.

comfortable seated and unrestricted position. Although a subject of debate, due to the relatively unknown degrees of the effects which vary greatly from person to person, the risk of suspension trauma makes having an effective rescue plan ready and implementing it as quickly as possible essential.

Last month Vertikal.net reported on an incident involving the eventual rescue of two men who were stranded in a 120ft JLG Ultra boom, whilst working on a large water tower in Massachusetts, USA. The lift had for some reason stopped working, stranding the two at a height of around 35 metres, in cold, wet and windy weather conditions.

Co-workers failed to retract the boom using the ground or emergency descent controls, so the emergency services were called. They arrived with a ladder platform, but it was nowhere near high enough to reach the elevated platform. Eventually the brother of one of the stranded men climbed to the top of the water tower and abseiled down to the rim near to the platform. He then used additional ropes to allow the two men to lower themselves from the platform to the ground, touching down over four hours after they had become stranded.

Although the men were successfully rescued it revealed a lack of planning, with both the employer and employees clearly failing to consider a rescue procedure. Apparently after the rescue took place a service engineer was able to lower the platform and drive it away under its own power. One has to wonder if anyone on site even knew the emergency lowering method for the machine or not?

What should have been a routine emergency lowering procedure turned into a high risk improvised recovery, putting three men in a high risk situation. Had the incident been more severe, for example had one of the men been hanging from his harness, a four hour rescue might have ended with much more serious consequences.



A successful rescue but far from ideal



Spanset training and rescue

As part of this article I attended a Spanset harness and rescue course which, while reiterating much of the content from the IPAF's MEWP harness course that I took last month, also covered safe rescue procedures for those who have fallen and are suspended in mid-air.

A rescue can be carried out in many different ways, depending on the circumstances, location and nature of the fall. Obviously the rescue procedure for someone working in a 20 metre aerial lift and someone working on the jib of an 80 metre tower crane or off the side of a 40 storey building varies enormously. A risk assessment should identify potential hazards and take into account all possible circumstances,

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Spanset's pre-assembled self-contained Gotcha rescue kit.

before determining the most suitable system to be used. Spanset provides a range of rescue systems, alongside its practical-based training modules, targeted at the construction, offshore/oil and gas, crane, powered access, scaffolding, telecoms and utilities sectors. Its Gotcha Rescue kit for example is a pre-assembled self-contained system designed to recover a suspended person whether conscious or unconscious.

In the event of a fall a rescuer, working from distance, can attach a safety line to the suspended person and raise them high enough to release their original lanyard, before either raising or lowering them to safety. The kit is fully assembled and comprises a three fall pulley-system for a 3:1 mechanical advantage. The double pulley end is attached to a suitable anchor point using a sling and the other end is attached to the suspended person's harness attachment point. The rescuer can now raise the person up sufficiently to allow the fall arrest lanyard to be disconnected. The pulley system incorporates a brake – gri-gri or belay device – so there is no chance of a free fall should the rope slip. The stranded person can now be lifted or lowered to safety.

Should the person be unable to assist in the rescue, for whatever reason, and they are beyond the normal reach of the rescuer, the system can be attached using the 3.5 metre extendable pole that is included in the kit. The specially designed 'frog' clip which attaches

the safety line to the harness, works easily from the end of the pole. The Gotcha rescue kit allows a trained user to carry out a swift and uncomplicated recovery in a wide range of situations without needing direct access to the person being rescued.

When we practised the procedure during the training course we managed to complete the rescue within two or three minutes and without too much difficulty.

A slightly different personal rescue system that has come onto the market recently is Latchways' self-rescue harness. The device is built into the harness in the form of a back pack. If the wearer is left suspended in his harness following a fall, a parachute type 'rip cord' is pulled lowering the person in a controlled descent up to 20 metres to the ground. Suitable for when working alone, its ease of use coupled with minimal training makes it an attractive option. It is worth noting that if the user is unconscious it becomes ineffective, although it could still help a rescue to lower them if they have the assistance of another lift to follow the descent.

What to do after a rescue

The emergency services should be notified as soon as possible regardless of the rescue procedure intended to be used. This will give them the maximum time to remotely assist with the rescue as well as travel to the location, whetherto help with the rescue itself or provide medical attention afterwards. Once a rescue plan has been successfully completed, if suspension trauma is a possibility the emergency crew needs to be informed and told of the circumstances surrounding the incident.

Current thinking is that no change should be made to the standard first aid guidance for the recovery of a semi-conscious or unconscious person in a horizontal position, even if they may be at risk of suspension trauma. The sometimes quoted suggestion of recovery in a semi-recumbent or sitting position is now considered to lack any evidence base and may prove dangerous through prolonging the lack of blood return to the brain.



Spanset instructor Steve Ashley demonstrating the Gotcha rescue kit



The extendable pole and special 'frog' clip enable the rescuer to carry out the rescue from a point of safety



Latchways' self-rescue harness in the form of a back pack