Riggingcall #5

A look at things (impartially, of course) from a rigging point of view.

Walking around during the build-up of a well-known entertainment industry trade show this year showed that a great many people use Personal Protective Equipment (PPE) when working at height. Sadly, most of these folks were climbing on trusses. This may seem to be a good thing - under certain circumstances.

The general principles of prevention in legislation state that PPE is the lowest tier in a hierarchy of control measures. For example, hard hats may be used to protect workers from falling objects in a work place, but only after other more effective methods are in place or are not possible - such as preventing access to the hazardous area, providing covered traffic routes and so on.

The falling objects only affect the people who need to be there, they use the hard hats. Other people are excluded and therefore do not need to use PPE; this requires planning and supervision to ensure the method chosen is applied and adhered to.

In basic terms, the Work at Height Regulations require employers and the self-employed to ensure that the method exposing workers to least risk of falls is chosen for tasks that must be carried out at height, subject to the duration and nature of the task.

You could argue that it feels safer scampering around a truss than being on tip-toe up a ladder, but that would be accepting the risk of serious injury, or worse, when safer options were available. In light of the potential severity of a fall from a height, any measures that need to be taken to guard against them may need to be proportionally stringent.

Using the falling object analogy again, the hazard needs to be controlled by designing the work to minimize the possibility of falling objects where possible, and if not to enclose the danger area and as a last resort to physically guard or at least delineate the danger area and clearly sign the hazard to those who need to enter.

I watched a chap sitting up on a lightweight triangular (apex down) truss structure, approximately 4.5m above the floor. He was wearing a basic industrial fall arrest harness with a 2m lanyard connected to one top chord of the truss he was sitting on. He had climbed up the truss tower and hooked up to the top chord of the horizontal truss. He climbed up past it and sat above it, ready to receive the moving light his colleagues were hauling up with a rope and pulley also rigged to his spot on the truss!

Should our PPE'd friend slip and fall (easy on a sweaty afternoon) he would have fallen, possibly on top of the moving light but certainly onto the various flightcases and production detritus beneath.

Why? Because even if the energy absorber didn't deploy, the 2m lanyard, plus the distance from the harness attachment point to his feet would have allowed only about 500mm clearance; this before allowing for any deflection in the truss, the height taken up by the equipment and possibly poor fit of the harness allowing a further distance to be fallen. If the energy absorber did deploy - even only 200-300mm - he would have hit the ground. I don't have space to discuss the force on the truss, possibly between 2.5kN - 6kN . . .

The thing that bothers me is that he thought he was safe because he was using 'safety' equipment. His manager regularly gives him grief about using his harness, so it's understandable for him to think it important and necessary - so he complied. Why don't people using structural systems - usually practical people - get it? They certainly can't have much understanding of the equipment they use, and haven't read the instructions that a (Category 3 PPE) product bearing a CE mark must be provided with.

The really interesting part is that in the middle of the stand in question were the Zarges they had used to rig everything else with . . .

As a point of interest, the maximum allowable extension of an energy absorber (using 'tear web' as the absorbing element) in Standards used for fall arrest is 1.75m. With a standard 2m fall arrest lanyard, this means the total deployed lanyard length could be 3.75m. To that you need to add the distance from the attachment point to the wearer's feet - maybe another 1.5m - meaning that the anchor point for the lanyard should allow at least 5.25m to fall into, before taking into account the other factors such as deflection of the supporting structure, objects beneath the fall area, and so on.

The further the distance fallen, the greater the force that needs to be absorbed, resulting in a greater extension of the lanyard. This is of particular importance when the fall may occur above the anchor point - although it is possible that the energy absorber may deploy fully in a short fall, it certainly could in a longer fall. (Another good reason to use a short lanyard).

Another sighting was a lampie, with spanking new kit, lying face down on a truss focussing. His shiny new climber's helmet clipped to his harness, his lanyard neatly wrapped around his waist - around £300 worth of PPE - is it just a fashion statement? If he'd decided that there was little point attaching himself to the truss (agreed) then why not remove the grass skirt of lanyards, slings and other things people seem intent on snagging themselves with?

The argument about attaching fall arrest to trusses is a moot point - there aren't many trusses that when loaded will sustain a dynamic 6kn point load on one chord. In the cases above, ground-supported exhibition stand truss structures would almost certainly be pulled over or suffer some kind of progressive failure in such situations.

The industry needs to recognize that providing a suitable means of access for the work being carried out is a legal duty of the employer, even before the introduction of the Work at Height Regulations this year. It may cost more, it may take longer, but using appropriate access equipment is necessary; climbing on trusses is not generally a safe

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system of work. Sadly, a prosecution is probably the only thing that will bring this home to people.

Using a set of Zarges to hang a few 500W fresnels is probably entirely justifiable, as is their use in set construction - but climbing on structures not designed for human support is no longer an option, much less attaching a fall arrest device that may impose a significant force on the structure. There were several stands that were using mobile access towers of various sizes, so it can be done. There was one contractor using a single width tower with a platform at over 3m with no outriggers.

As a final observation - the house riggers were using work positioning lanyards in their access machines, peak-less hard hats with chin straps at all times during the day and used 'banksmen' on the ground to act as sentries and a second pair of eyes. As sure as eggs are eggs, some will not have adhered to procedures as they should, but as a practical illustration of safe systems of work it demonstrated it is possible, and without vast expense or over implantation of regulations.

There is an assumption made by many suppliers that using PPE as a system of work is the preferred or only way to do the work.

The principles of work at height are the same as in any area of risk: reduce risk by designing work to eliminate hazards, and where that isn't possible reducing exposure to hazards, dealing with the remaining hazards according to the same hierarchy.

Many suppliers of 'height PPE' have built their businesses servicing the construction and engineering sectors where such techniques are practicable and justifiable.

The advice available to the entertainment industry from those suppliers may therefore assume factors with which the suppliers are familiar but our industry historically never consider; in fact, there often isn't a risk assessment in place, let alone method statements or company procedures.

Yes, a competent person would consider rescue plans, but we are an industry that, by and large, still believes wearing a harness makes work 'safe'. We are not alone in this view, of course. Since we are also an industry dedicated to what we do, we perhaps ought to apply the same rigour to work at height as we do, say, to electrical safety. (Some may also add rigging to this list…)

A safe system of work can be defined as "the integration of people, articles and substances in a suitable environment and workplace to produce and maintain an acceptable standard of safety. In this system, due consideration should be given to foreseeable emergencies and the provision of adequate facilities".

Therefore, the provision of PPE for work at height - harnesses, lanyards, helmets and so on, is not end of the story. Very often employers allow employees to select and purchase PPE themselves. This can lead to a lampie being sent off to the nearest outdoor shop with £200 from petty cash. Bringing their own climbing gear in to work - even if self-employed - may mean that equipment that does not meet the standards of the PPE Regulations is being used in situations where compliance with standards is necessary. This might have serious repercussions in the event of an accident, practically and in terms of insurance cover. Even when such PPE is compliant, the employer should be able to check and approve the PPE for use in his business, rather than assume the user is an expert.

Selection of PPE should take place after a risk assessment has been made and eliminated hazards at source wherever possible: controls can then be designed for the remaining hazards, suitable PPE being selected for hazards that cannot be controlled in any other way.