

Greetings all. Today's topic is about safety when lifting or suspending loads near personnel.

Suspended loads pose a very real risk to people on site and while this may sound obvious – crane and site operations are inherently complex, and incidences and near misses occur all too frequently.

According to current literature, between 30 - 42 per cent of all crane-related occupational fatalities have been due to workers being struck by falling objects during a crane's operation.

Video camera systems and computer modelling are being used by industry and constantly developed to remove 'blind spots' and to overcome the challenges that come with numerous vehicles, equipment and people working simultaneously on site.

Technology is wonderful, but it does not replace critical thinking, planning and being aware of the risks at all times.

Having a load suspended high overhead is a major hazard, as it possesses 'Gravitational Potential Energy' (GPE) which is basically a 'height' energy. The higher the object, the higher the GPE and the greater the object's potential to cause harm or damage if it were allowed to fall or is suddenly no longer supported or restrained.

This can be reduced in only two ways: by reducing the suspended mass or by reducing its height.

In lifting a load, the first option is seldom possible, so, minimising the height is the best way to lower the potential damage from a suspended load. Keep loads as low to the ground as possible.

There is another very good reason to monitor load height and that is because of a phenomenon called: "The Fall Zone" - the higher the object is, the less certain you can be about where it will land if it falls.

The fall zone projects out beyond the suspended load and among other factors, is affected by the height of the load as well as its size, shape, centre of gravity, and connection points.

These variables determine the direction and distance the load may swing, fall or roll should an incident

occur. Remember that the fall zone is dynamic because its size changes with different crane load types and heights.

For example, a stillage full of scaffolding poles, if not properly slung and then dropped, will tumble out randomly and any impact with solid objects will cause them to bounce/deflect drastically.

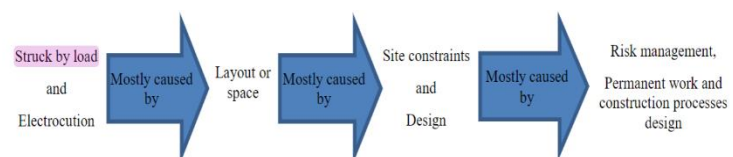
It is imperative that the fall zone be accurately identified for crane operators and workers on a construction site. It is crucial for knowing the area an exclusion zone should be. Planning the load path is also easier if you are certain as to where the fall zone is.

Highly suspended loads will either create too large an exclusion zone or render the smaller exclusion zone useless if the load could easily fall outside of it.

Carry out a risk assessment when setting up an exclusion zone. Use appropriate signage and/or barriers such as perimeter fencing to make sure only those people who are involved with the lift and know what they are doing are in the lifting zone.

The importance of planning, creating and monitoring exclusion zones cannot be understated. Gharaie, Lingard and Cooke in their 2015 article, **Causes of fatal accidents involving cranes in the Australian construction industry**¹, found that:

"Struck by load" accidents involved issues of site layout/space, equipment, and workers' actions. Site layout/space was a common cause ... being a relevant factor in 50% of accidents in which a worker was struck by a load and 100% of accidents resulting in electrocution.



Weather conditions are another factor necessitating a larger exclusion zone. Winds can have a huge impact on the load, which in turn can affect the crane's

¹ Gharaie, E., Lingard, H., & Cooke, T. (2015). Causes of fatal accidents involving cranes in the Australian construction industry. *Construction Economics and Building*, 15(2), 1-12.



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stability. Wind can cause the load to move laterally and can place side loading on the boom which may result in the boom collapsing.

In some wind conditions, the operator will need to reduce the crane's working wind speed for large loads. Some elements may not be able to be lifted if the wind is too strong, so wait until the wind speed reduces.

A tagline can be used for guiding certain loads during light winds. But if the wind force is strong and the dogger cannot manage the load with the tagline, then you need to stop and reassess the lift.

Here are some key things to remember when working with a suspended load:

1. So far as is reasonably practicable, no loads are to be suspended over or travelled over a person.
2. Complete a SWMS, plan all lifts and set up exclusion zones, remembering that exclusion zones are not static but change depending on the crane in use, the size, shape, centre of gravity and load connection points.
3. Ensure all relevant personnel are inducted and know what is happening.
4. Set up safe systems of work.
5. Supervise and ensure exclusion zones and Safe Systems of work are followed.

Crane operators can face scenarios where those working around the load near the load path are not crane crew but other trades with their own job to concentrate on. Their mind may be focused on what they are doing, and they may not have their attention on the activities of the crane and crew. They need to be made aware at the prestart meeting of the hazards involved with working around suspended loads.

Do not assume anything.

WorkSafe has issued a previous safety alert, which can be [found here](#).

Gharaie, Lingard and Cooke's 2015 article can be found [here](#).

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