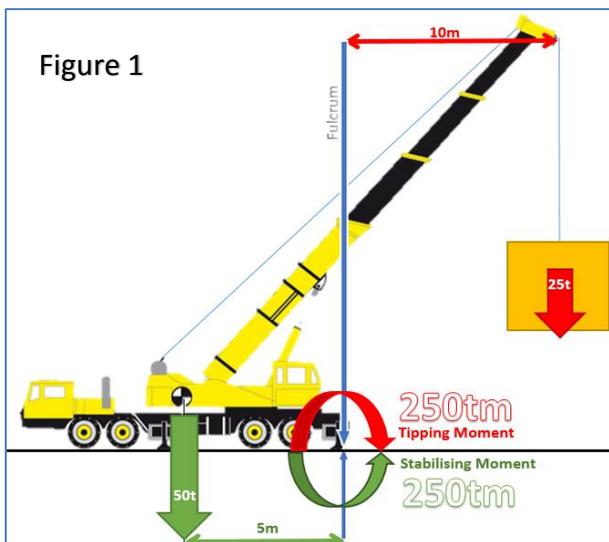


Greetings all. Today's topic is **Load Moments**

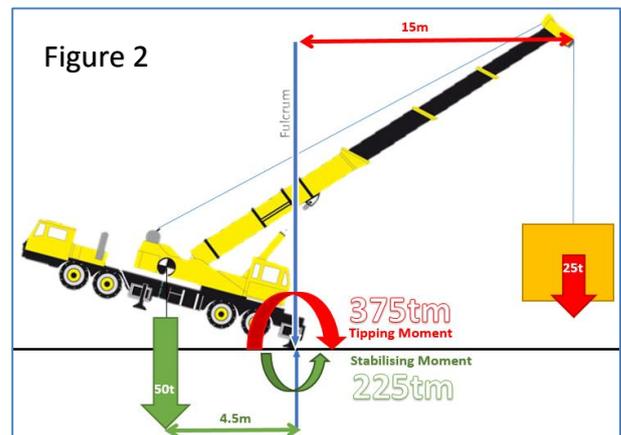
“The Slippery Slope”

Following on from the previous discussions on load moments – the maintaining of stability with a mobile crane is dependent on a unique set of variables in the cranes setup such as outrigger position, boom length / angle and load / radius. As well as contributing external factors like wind speed and ground stability. One common factor that will always remain consistent is the application of PHYSICS. For example, in an overload scenario, the crane may have gone outside the load chart and the outriggers are still on their pads, so one may be fooled into considering all is ok to stretch that little bit further; a practice that is condemned and not encouraged by any means. Rather we provide via this bulletin an overview on what may happen when safety factors are ignored and cranes are allowed to operate at or near the ‘limit’ or tipping point.

For this purpose we adopt a simple review on the crane to our right, operating on the tipping point where the [load x radius] is [25t x 10m] = 250tm and the center of mass of the crane is 50t located 5m away from the pivot point, so [50t x 5m] = 250tm. Clearly we must be outside the load chart here, however the stability is maintained in a static sense.



Consider for a minute if you the ground conditions were substandard and the ground moved slightly beneath the rear outriggers whilst a gust of wind hit. The load shifts, and the boom deflects – thus causing an increase in radius! The crane now tips to the right towards the load side. The next diagram will show an example of this exaggerated so it's clear. But the fundamentals don't change. We see the original calculations have changed for the worst. The crane's center of mass is now closer to the pivot point or fulcrum and the 25t load is now at a greater radius!



Let's look at the numbers again, we have [50t x 4.5m] = 225tm against [25t x 15m] = 375tm. As soon as a crane tips... it wants to tip more. The key factor to consider here is that within chart or comfortably within chart, we must always consider the potential external factors when operating our equipment, as once you go over the edge, there is often little chance of coming back. Safety factors are there for a reason as the load charts represent perfect & ideal scenarios. Stick to your load charts and you should never be in the scenario of Figure 1, let alone Figure 2.

Cheers for this week and stay safe.

www.cica.com.au