Using non-slewing mobile cranes

Mines safety bulletin no. 181 | 10 April 2019 | Version 1

Background

Non-slewing mobile cranes continue to be involved in incidents in the Queensland mining and quarrying industry. They are used regularly around sites and have particular hazards associated with them such as:

- travelling with a load
- lifting loads whilst articulated in combination with being on a side slope
- used in congested areas.

This document provides guidance for when lift plans should be established or considered in order for the risks to be as low as reasonably achievable.

Lift plans

A documented lift plan should be established when:

- the mass of the load is more than 75% of the rated capacity of the crane at the planned boom length, load radius, side slope and degree of articulation
- using spreader bars
- working near live overhead power lines
- lifting workers in a crane workbox
- lifting in a congested area
- lifting shipping containers or dongas
- more than one crane is involved in the lift.

A documented lift plan should be considered when:

- the mass of the load is more than 50% of the rated capacity of the crane at the planned boom length, load radius, side slope and degree of articulation
- the mass of the load is not evenly distributed
- the load has an irregular shape
- it is a non-routine lift.

The template for the lift plan should have provision for documenting the following:

- description of the task to be carried out
- the mass of the load to be lifted
- ensuring the crane has the rated capacity taking into account the articulation and side slope
- use and retrieval of tag lines
- securing items that might fall from the load or be dislodged
- establishing an exclusion zone to exclude workers not involved in the lift
- determining and avoiding an entrapment and/or impact zone
- determining and avoiding the drop zone if the lifting gear fails and the load falls
- checking the stability of the ground
- a spotter if working near powerlines
- identifying any other hazards that need to have controls.

Irrespective of when or who developed the lift plan, it must be reviewed and signed off by all the workers involved in the lift on the day and by the person supervising the lift.

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Version 1, 10 April 2019
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Single point attachment on the hook

Following the introduction of soft slings, one disadvantage emerged - soft slings have no master link. If the risk of a sling detaching from the hook is to be as low as reasonably achievable, there must be a single attachment on the hook. This is easily accomplished by placing the soft slings onto a bow shackle and then placing a bow shackle on the hook with the pin of the bow shackle resting on the hook as shown in the image.

There will be rare occasions when there is limited height available and the only way to minimise the height is to not use a bow shackle. In these circumstances, irrespective of the mass of the load, a lift plan should be developed.

Function of safety catch

The safety catch is not designed to take any load. The purpose of the safety catch is to prevent an unloaded attachment on the hook from coming off the hook.

Drop zones

A drop zone is an area where there is a risk of injury due to a failure of the attachment of the load to the hook, an object falling from the load or a detachment from the hook. The drop zone moves with the load. Workers most at risk are doggers.

Strategies that assist in minimising the exposure to the drop zone are:

- Attaching taglines before the lift takes place. If during the lift they need adjustment, the load should be lowered to a safe position.
- A hook at the end of a steel rod can be used to retrieve the tag line.
- Only attach a tag line when it is needed.
- Attach the tag line to the crane when travelling
- Not raising the load higher than necessary because the closer the load is to the ground, the smaller the drop zone becomes.
- Not approaching the load unnecessarily. Only approaching the load when it is at its final location or close to it.

Exclusion zones

The purpose of an exclusion zone is to keep workers who are not involved in lifting or lowering a load out of the area. For instance the zone would include lifting a load from one location and setting it down at a different location. The zone should have clearly defined boundaries.

Entrapment and impact zones.

Loads can swing wildly and suddenly like a pendulum, entrapping and/or impacting a worker. Controlling the load has to be effective under the following circumstances:

- if the crane was not lifting vertically above the centre of gravity of the load
- when they break free from foundation bolts or a suction force
- due to a change in load radius as a result of boom deflection
- if the load strikes an object during its relocation.