

# Overturning of pick and carry cranes

This Alert highlights the risks of overturning pick and carry cranes while traveling with a suspended load. It also provides guidance to duty holders (such as employers and self-employed persons) on managing these risks.

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## Background

Overturning pick and carry cranes can expose the operator, dogman, rigging crews and other people (including members of the public) to a risk of death or serious injury.

WorkSafe has attended numerous incidents where pick and carry cranes have overturned while traveling with a suspended load. Contributing factors have included:

- a failure to derate the crane's lifting capacity as per manufacturer's requirements
- excessive boom angle and boom extension
- uncontrolled load sway (pendulum motion)
- moving up, down or across a slope
- changing direction (articulating) or manoeuvring around obstructions
- excessive speed
- under inflated tyres.

The risk of a pick and carry crane overturning increases significantly if more than one of the above factors occur at the same time.

## Safety issues

The lifting capacity of pick and carry cranes is reduced when traversing slopes or changing direction. Reduced lifting capacity should be taken into account when planning a lift to ensure the crane does not become unstable and overturn.

Standard load charts on many pick and carry cranes can only be relied on when traversing minor variations in surface gradient or for minor crane articulation during lifts.

## Control measures

The risks from overturning must be eliminated, so far as is reasonably practicable. If it is not reasonably practicable to eliminate the risk of overturning, it must be reduced so far as is reasonably practicable.

The appropriate duty holder should ensure that a competent person plans the lift. The following matters should be taken into account when planning the lift:

- the load/s to be moved
- the travel path, including slopes to be traversed
- changes in surface gradient (camber, gutters etc.)
- changes in the surface (soft spots, uncompacted material, backfilled trenches etc.)
- any manoeuvres or changes of direction
- the crane manufacture's operating recommendations for maximum slope and deration of rated capacity
- weather conditions and any potential for wind tunnelling by surrounding structures

- crane operator's experience with the specific crane.

In some situations, it may be reasonably practicable to eliminate the risk of overturning by selecting another type of plant more suitable to moving the load (eg move the load on a truck).

If not reasonably practicable to eliminate the risk, you must, so far as is reasonably practicable, reduce the risk by using engineering controls such as a crane with operator aid devices that automatically derate the cranes lifting capacity for slope and articulation or monitor tyre pressures.

Reduce the risk of overturning by ensuring the pick and carry operation is within the manufacturer's specification for the crane. If outside the specifications, ensure the lift is only undertaken as a designed lift.

The crane operator must have an appropriate high risk work licence and also be familiar with the specific crane being used and its operating limitations.

Even when high order controls are implemented they need to be supported by safe systems of work such as:

- checking crane tyres are properly inflated and in good condition
- keeping loads near the ground, close to and up-hill of the crane (eg reverse down slopes)
- keeping the boom tip is as low as possible by using minimal boom extension and the lowest boom angle
- keeping the articulation angle to a minimum by;
  - using large radius or multiple point turns to change direction, or
  - landing the load and reposition the crane instead of traveling with the load through turns or on slopes.
- using tag lines to limit load sway while moving the load.

The duty holder should establish an exclusion zone to keep non-essential people out of the potential overturning area.

If the crane lift is construction work, the hazards, risks and controls must be documented in a safe work method statement (SWMS) which must be followed while the lift is being undertaken.

## Further information

WorkSafe Victoria's Booklet – Working Safely in General Construction

Australian Standard – AS 2550.1-2011 – Cranes, hoists and winches – Safe use – General Requirements

Australian Standard – AS 2550.5-2011 – Cranes, hoists and winches – Mobile Cranes

Crane Industry Council of Australia, Position Paper, CICA-PA-0009-B, *Articulated Crane Operator Requirements* available at [cica.com.au](http://cica.com.au)

### Contact Details

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For more information on occupational health and safety, go to WorkSafe's website: [worksafe.vic.gov.au](http://worksafe.vic.gov.au)

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