



Significant Incident Report No. 236

Subject: Near miss when a pick-and-carry crane rolls over

Date: 21 December 2015

Summary of incident

In November 2015, an articulated, pick-and-carry mobile crane at a mine site was positioning a cyclone tie-down block weighing about two tonne. The crane operator moved the machine with the boom almost fully extended, the hook block sheave in hard contact with the boom end sheave (known as two-blocking), and a swinging load (with no control on the tag line).

As the crane moved backward, was articulated, then moved forward, a front wheel travelled onto soft material on sloping ground and the crane tipped onto its side. The dogman, who was acting as a spotter, had to move quickly to avoid injury as the crane rolled towards him. The crane operator was uninjured.



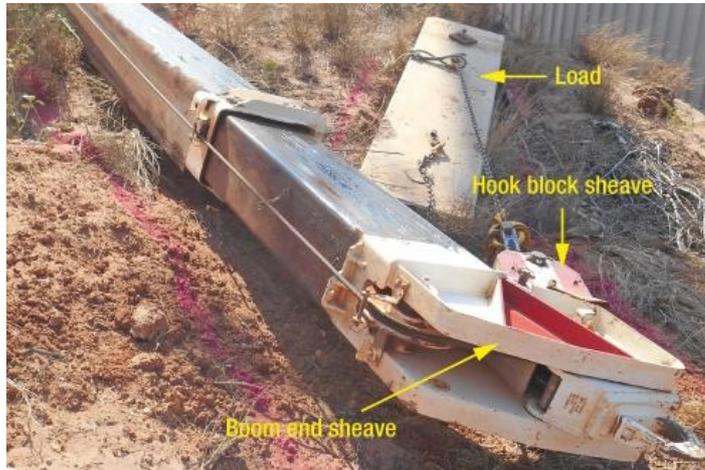
Pick-and-carry crane on its side

Direct causes

- The crane was being operated outside of its design criteria, changing its centre of gravity and destabilising the machine:
 - the boom was almost fully extended and elevated
 - the crane was articulated while travelling, with the load raised and swinging.
- The ground was sloping and uneven (e.g. front wheel travelled from sealed hardstand to uncompacted material).

Contributory causes

- The hazards associated with moving the load were not fully identified or controlled. For example, the boom end sheave and hook block sheave were in hard contact (i.e. two-blocked).
- The mine site verification of competency appears to have been remiss in identifying shortfalls in the competency of the crane operator and dogman.



Extended boom of the crane and the two-blocked sheaves

Actions required

The following actions are recommended to reduce the potential for pick-and-carry cranes to destabilise.

Competency

The following requirements apply under the Mines Safety and Inspection Regulations 1995.

- A person (e.g. crane operator, dogman, rigger) must not do high risk work of a particular class at a mine unless they hold a high risk work licence for that class of work [r. 6.37 (1A)(a)].
- Before commencing work at a mine every worker must be assessed to verify they are competent to perform the tasks assigned and operate any plant or equipment they are required to operate (e.g. pick-and-carry crane) [r. 4.13 (1)(b)].
- Construction work is to be carried out by competent persons [r. 4.20].

Safe systems of work

- Before a crane operation is undertaken, a competent person should conduct a risk assessment.
- A competent person should:
 - formulate a safe work procedure
 - monitor the procedure for its ongoing effectiveness
 - modify the procedure if found to be deficient, the task changes, or associated risks change.

Crane operation

- The requirements of the following Australian standards should be met when pick-and-carry cranes are operated:
 - AS 2550.1 *Cranes, hoists and winches – Safe use – General requirements*
 - AS 2550.5 *Cranes, hoist and winches – Safe use – Mobile cranes.*

- When determining load capacity, ensure the original equipment manufacturer's (OEM's) de-rating instructions for ground slope are available and followed.
- When operating a crane, follow the instructions of the OEM for:
 - determining load capacity
 - extension of the boom (e.g. consider load capacity, articulation and ground slope)
 - articulation, movement and load position
 - movement of the boom and hoisting the load (e.g. at rest)
 - eliminating two-blocking practices.
- Confirm ground conditions are capable of supporting the crane and its load where the crane will be operating.

Further information

- Resources Safety safety alerts, www.dmp.wa.gov.au/Safety/Mines-safety-alerts-13194.aspx

Mines Safety Bulletin No. 102 *Addressing the potential for mobile (pick-and-carry) cranes to topple sideways*

- Resources Safety manufacturer's product safety alerts, www.dmp.wa.gov.au/Safety/Manufacturer-s-product-safety-4998.aspx

Notes to accompany Terex Information Bulletin: Operating on side slopes (May 2014)

Terex Information Bulletin: Operating on side slopes (September 2007)

- Resources Safety Raising the issue hazard awareness videos and toolbox, www.dmp.wa.gov.au/Safety/Hazard-awareness-videos-16435.aspx
- Standards Australia, www.standards.org.au

AS 1418.1 *Cranes, hoists and winches – General requirements*

AS 1418.5 *Cranes, hoists and winches – Mobile cranes*

AS 2550.1 *Cranes, hoists and winches – Safe use – General requirements*

AS 2550.5 *Cranes, hoist and winches – Safe use – Mobile cranes*

- The Crane Industry Council of Australia (CICA), www.cica.com.au/docs/default-source/technical-information/cica-pa-0009-b-position-paper-articulated-crane-operator-requirements.pdf?sfvrsn=2

CICA Position Paper, *Articulated Crane Operator Requirements*

This Significant Incident Report was approved for release by the State Mining Engineer on 21 December 2015