



Coal Inspectorate | Bulletin | No.199 V 2 | 07 August 2023

# Pick and Carry Cranes

## What happened?

**\*UPDATED ON MONDAY 7 AUGUST, 2023\***

Note - Version 1 of this Safety Bulletin was published on 14 December 2021.

Pick & carry cranes (commonly referred to as Franna cranes) are widely used in coal mines, however, they have been involved in several concerning incidents involving rollovers, loads falling, mechanical failures as well as uncontrolled movements and collisions. The Crane Industry Council of Australia estimates articulated pick & carry cranes currently account for somewhere between 64% - 68% of all crane incidents.

In 2021 more than ten high potential incidents including five rollovers involving pick & carry cranes have been reported to the Coal Mines Inspectorate.

Further incidents have been added below.

### Incident 1

On 18 July 2021, a pick & carry crane was unloading an elevated work platform (EWP) from a flat tray truck. As the operator moved the crane to place the EWP on the ground, the left-hand wheels of the crane rode up on a small (150mm) dirt rill as the right-hand wheels moved into a lower area and the crane tipped on its side. No persons were injured.

### Incident 2

On 21 June 2021, whilst lifting a 40 ft container, a fully articulated pick & carry crane reversed over a 150 mm concrete slab, resulting in the crane rolling onto its side (figure 1). It was reported that the crane operator deviated from the planned travel route and the dogman was watching the load, and not where the crane was travelling. No persons were injured in this incident.

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### **Incident 3**

On 11 April 2021, whilst moving a large generator, a pick & carry crane tipped on its side (figure 2). The crane was operating at full safe working load, travelling on uneven ground and articulated. It was reported that the load monitoring system override function was activated multiple times prior to the rollover. No persons were injured in this incident.

### **Incident 4**

Whilst relocating a mobile pick & carry crane on site, the operator lost control and rolled the vehicle on its side (figure 3). The coal mine worker (CMW) was able to exit the vehicle, however suffered injuries requiring hospitalisation.

### **Incident 5**

On 1 August 2023, an articulated mobile crane and three workers were despatched to turn a pump protection cover over. During the lift, the load moved unexpectedly and struck one of the coal mine workers below the right knee. The skin was cut and lacerated to the bone and possible fracture to the leg. The coal mine worker was transferred to the hospital, and the injuries identified included a broken tibia and fibula.

### **Incident 6**

On 31 July 2023, an event occurred at a CHPP train loadout facility, whereby a 25 Tonne articulating mobile crane was in the process of unloading a temporary building off a transport truck. During this process, the Crane rolled onto its side. The crane operator was transferred to the hospital, and the injuries identified included significant bruising.

### **Other incidents reported**

- An uncontrolled fall of a large suspended galvanised culvert occurred when the crane operator jibbed out the boom, snapping the load sensor cable. This caused the main winch to release the suspended load which then fell 7 to 8 metres.
- A pick & carry crane was lifting an oxygen cylinder rack off the back of a truck when the rack became caught on an adjacent rack, resulting in the cylinders falling out of the rack and into the drop zone in front of the crane.
- A parked pick & carry crane rolled backwards approximately 43 metres from the workshop apron, coming to a stop against an earth bund.

- During the installation of a monorail (weighing approximately 100kg) at a coal preparation plant, a pick & carry crane and an occupied EWP were working alongside. Whilst repositioning the pick & carry crane it struck the EWP's front left-hand wheel causing the EWP to jolt.

## How did it happen?

The review of the incident investigations identified multiple common causes:

- The mine Standard Operating Procedures (SOPs), including those for selecting, maintaining & using lifting equipment, didn't include specific risk-based controls for pick & carry crane operations.
- CMWs' demonstrated a lack of familiarity with site requirements specified in lifting and crane SOPs. In particular, site requirements for lift plans and job safety analyses.
- Mine site training competencies did not adequately include and assess pick & carry crane operations.
- Crane operators, whilst authorised and deemed competent, were unable to demonstrate or correctly apply crane load derating tables.
- A crane operator, whilst authorised, did not utilise the load monitoring system correctly, or understand the hazard created when fully articulating the crane under load.
- The crane load monitoring system was not set up correctly to alarm in the event of an exceedance of the crane's lifting capacity.
- Pick and carry cranes involved in rollovers were repeatedly attempting to lift and move loads which were near the rated capacity of the crane on firm level ground. Rated capacities are typically based on freely suspended loads with the crane on firm, level (max 1% slope, 0.57 degrees) and uniform surfaces. Crane operators did not adequately consider load derating factors due to any or a combination of the following:
  - Operating at near rated capacity (based on an even level surface)
  - Extended jibs
  - The travel route and conditions to be experienced along the route, including:
    - articulation of the crane body
    - effects of changing ground conditions (potholes, rills, concrete slabs, uneven road surfaces, increases in slope) and side slopes that can occur whilst travelling carrying a load.

When the above factors were considered, the carrying capacity of the crane may be significantly reduced, resulting in rollovers whilst travelling.

- Operators did not assess travel routes prior to commencing pick & carry operations.
- Uneven ground conditions were not immediately rectified once identified.
- The crane operator deviated from the plan, fully articulating the crane in an attempt to navigate around obstacles in the travel path, resulting in a rollover.
- Alternative travel routes were not considered by CMWs completing the task.
- The dogman was focused on the load and did not observe the travel path while the crane was reversing.
- The crane operator did not stop the task when it did not feel right.
- The crane operator repeatedly used the load monitoring system override switch to continue crane operation prior to rollover.

- Alternative methods for equipment relocation were not considered.
- The crane's speed was not suitable for the surface conditions although less than posted speed.

## Recommendations

It is recommended that the Site Senior Executive:

- Review the Mine Safety & Health Management System including SOPs for selecting, maintaining & using lifting plant and ensure specific risk-based controls for pick & carry crane operations are included and documented. Consideration should be given to:
  - very few areas on a mine site where pick & carry cranes are utilised can be considered to be firm, level and uniform. Consider reducing the allowable crane load capacity to cater for wheel ruts, potholes, protrusions and depressions found on "flat" mine surfaces
  - review the selection process used for lifting equipment to ensure the most suitable plant is selected i.e. is a forklift better suited to the task than a pick & carry crane?
  - if no derate chart is available, pick & carry cranes should not be operated on a side slope
  - avoid travelling loaded pick & carry cranes across slopes or over potholes, soft ground, road chambers or shoulders, rills or any objects as these could destabilise the crane or load
  - implementing lift plans which minimise or eliminate the need to travel whilst carrying a load (i.e. take the transport to the item instead of taking the item to the transport)
  - revision of speed limits for cranes travelling on-site.
- Implementation of a site-specific pick & carry crane form or permit that includes:
  - assessment of site conditions and load derating factors to be applied in determining the carrying capacity of the pick & carry crane
  - a site inspection of the travel route; including demarcation of areas a pick & carry crane is not to be used.
  - identify and implement no-go zones and drop zones.
- Review site authorisation processes for lifting and crange. Ensure operators are trained and experienced and can demonstrate details of the cranes limitations, use of derating charts and monitoring systems
- Review the use of crane load monitoring systems. Consider fitting if not currently installed
- Ensure the training and assessment material for operators includes the understanding of the use and function of the load monitoring systems, alarms and system triggers
- Refer to the documents listed under References and further Information for more detailed guidance.

## References and further information

1. Mobile crane - Code of Practice 2006 (PN11180): Workplace Health and Safety Queensland;
2. Safety Bulletin – Operation of articulated cranes SB – 2021 – 02 Issued: September 21 National Heavy vehicle regulator
3. CICA – Vic / Tas Branch Crane Safety Bulletin #290 August 2021
4. Federal Safety Commissioner's Hazard 2020 Safety Campaign Webinar – Articulated Cranes – 28 July 2021

5. Using mobile cranes in 'pick & carry' operations safety alert. Safework NSW 2013

6. Prevent pick and carry cranes from overturning Work Safe Victoria 12 Oct 2021



**Figure 3**



**Figure 2**





## Authorised by Jacques le Roux - Chief Inspector – Coal

**Contact:** Anthony Logan, Senior Inspector of Mines (Mechanical) , +61 7 3199 8001  
[QldMinesInspectorate@rshq.qld.gov.au](mailto:QldMinesInspectorate@rshq.qld.gov.au)

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All information on this page (Pick and Carry Cranes - <https://www.rshq.qld.gov.au/safety-notices/mines/pick-and-carry-cranes>) is correct as of time of printing (Sep 3, 2024 1:45 pm).