

Greetings all. Today's topic is about Crane Accident Analysis. Crane accidents occur for several reasons. These incidents are all unique but often have similar contributing factors. When we understand these factors, we are best place to prevent incidents occurring again.

In 2015 a paper was written at RMIT entitled.

"Causes of Fatal Accidents Involving Cranes in the Australian Construction Industry"

The paper studies a 10-year period from 2004-2013 where 359 workers died in the Australian construction industry because of work related causes. Of these there are 258 'closed cases' of which 22 involved a crane.

The RMIT paper investigates crane-related fatalities in order to find the upstream causation of such accidents. The National Coroners' Information System (NCIS) database was searched to identify fatal accidents in the construction industry involving the use of a crane. The narrative description of the cases provided in the coroners' findings and associated documents were 'content-analysed' to identify the contributing causal factors for each case.



The Majority of the incidents involved concrete loads

The "Loughborough Model" posits that three levels of accident causes can be identified. These are:

1. Immediate circumstances
2. shaping factors
3. originating influences.

Immediate circumstances of accidents include the suitability, usability and conditions of Crane/rigging equipment, the behaviour, motivation and

capabilities of workers, and features of the physical site environment such as layout, lighting and weather conditions.

Shaping factors are the factors that precede the immediate circumstances, and include factors such as the level of supervision, site constraints, worksite design, poor communication within work team, the state of workers' health, and fatigue.

Originating influences which can include the economic climate, the prevailing level of construction education, design of the permanent building/structure and the quality of project management, safety culture, and risk management in the construction project.

The 22 accident cases are individually summarised, and the findings show that the most frequent crane-related accident types were those that were **struck by load**, and **electrocution**. I've written bulletins on electrical safety previously and Lifting Matters is running a [feature](#) on this topic currently.

Interestingly the **struck by load incident category** refers more to loads falling or becoming dislodged and has a very high representation of precast panels, beams and concrete loads. Why these loads strike personnel were due to many reasons ranging from inadequate slinging, unstable stacking/dunnage, booms breaking, cranes tipping, rigging failures and even cranes striking and dislodging stacked material. There were no winch or rope failures.

The most prevalent immediate circumstance causes were **worker actions and restricted space**. The two most commonly identified shaping factors were **physical site constraints** and **design of construction process**. **Inadequate risk management system** was identified as the main originating influence on the accidents.

What this tells us is when you look at root causes, Risk Management and skill/training are paramount. There are always going to be physical constraints and planning challenges, but these need to be managed. Further to this when heavy loads like concrete are involved, the incident consequences are greater and now more than ever we need to ensure we have qualified and competent workers, safe and suitable equipment and the space and environment to work safely.

Look Out for each other -CICA