

Greetings all. Today's topic is: Doing your bit to mitigate risks when using articulated steering cranes.

On 16 September 2013, Christine and Samuel Leonardi's car was [struck by an articulated steering crane](#) while on their way to school. The result was devastating. The damage to Mrs Leonardi's vehicle was so extensive that the make and model of her vehicle were unrecognisable.

Coroner John Hutton [delivered his findings of the coronial inquest](#) on 11 October 2017.

In the coronial review it was determined that articulated steering cranes have unique characteristics that make it difficult to re-gain control in the event of a loss of control at speed.

The Coroner¹ found that these unique characteristics include:

Frame steering results in the driver rapidly rotating in the direction of steering.

Trucks, buses and cars have 'Ackerman steering', meaning that they are steered by turning the front wheels. The body of these vehicles do not rotate, only the front wheels. Therefore, the driver stays with the body of the vehicle when the wheels and vehicle turns.

Whereas, mobile articulated cranes have 'frame steering'. They steer by pivoting (articulating) the crane in the middle, which in effect turns the front wheels in relation to the rear wheels.

A driver of a mobile articulated crane does not steer with the front wheels. The driver is physically rotated with the front half of the cabin in the direction of steering. This leads to a different sensation by the crane driver.

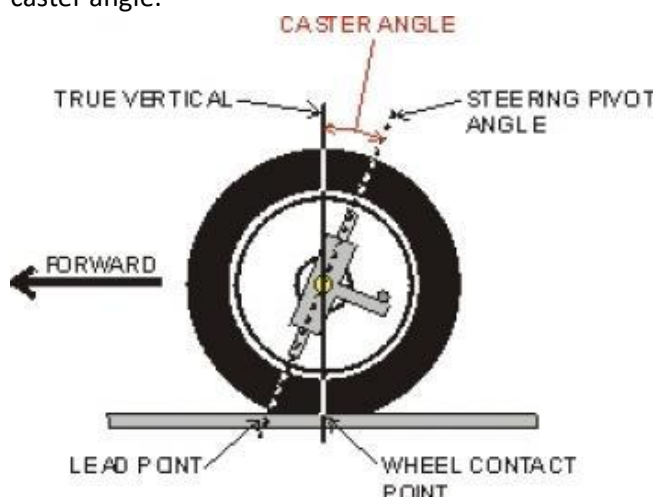
Hydraulic cylinders and lack of feedback leads to 'twitchy' steering

The lack of feedback in the steering wheel means that the steering wheel can be turned very quickly

with little effort. This can lead to over-steering (i.e. where the driver's steering over-corrects and turns too far).

Front wheels do not naturally straighten up

The front wheels of trucks, buses and cars have caster angle.



This means that they tend to act like the caster wheels on a shopping trolley. When the steering wheel is released after a turn is completed, the caster effect tends to bring the wheels back into a straight line.

Whereas, in mobile articulated steering cranes, when the steering wheel is released, the steering does not tend to naturally straighten up. This means that the driver must always remain very attentive and active with their steering.

Stiffly sprung suspension

The suspension on some mobile articulated steering cranes is stiff to support the lifting rated capacity. This means when driving on-road bumps and undulations in the road are felt by the driver.

The stiff suspension comes about because when the crane is being used as a crane, it needs to lift up a heavy load at the front. The entire load must be supported by its front suspension.

¹ 11 October 2017, [Findings of Inquest into the deaths of Christine Nan Leonardi and Samuel John Leonardi](#)

Mobile articulated cranes are specifically intended to drive around work sites with the load suspended at its front. This stands in strong contrast to other mobile cranes, which rarely travel while suspending a load. Other mobile cranes use outriggers to deal with the large, lifted loads and use dedicated road suspension when travelling along roads.

Coronial recommendations

The Coroner made several recommendations, including to amend the national licensing scheme so that before a driver is authorised to drive a mobile articulated steering crane on a public road, they must undergo a:

1. Practical assessment on a public road in a mobile articulated crane; and
2. Theoretical assessment addressing the unique handling characteristics of mobile articulated cranes and emergency procedures in the event of a loss of control.

Current driver training on offer for heavy vehicles (prime movers and trailers) is the opposite to a safe response with an articulated steering crane.

The recommendation was for a government agency to develop the practical and theoretical assessment; however, The Crane Industry Council of Australia (CICA) was approached to deliver it instead. CICA received a grant from the Federal Government through a Heavy Vehicle Safety Initiative through the NHVR to develop this program.

It is important for employers / managers, to understand that their role is to do what is 'reasonably practicable' to ensure the health and safety of their crane operators and others on construction sites and on the roads.

CICA's On-Road Articulated Steering Mobile Crane Training Course

For the theoretical component, CICA partnered with Area 9 Lyceum, the global leader in Adaptive Learning to use their AI technology, to develop an online training program that can assess the operator's

familiarity with the driving behaviour of articulated cranes.

This training program uses an Adaptive Learning model, so for experienced operators, the training and assessment will be accelerated; for inexperienced operators, however, the training will be more thorough. This variation in training that credits the industry for existing knowledge while providing additional training for those not yet competent.

The online 'adaptive learning' component also provides flexibility, so operators can complete that aspect of the program individually during down time.

This model provides excellent feedback on what the crane operator does and doesn't know, which also means the solution is tailored. The course is not 'one size fits all', so an experienced operator with a good understanding of how to safely operate a pick and carry crane won't be required to complete modules when they demonstrate they already know.

The online component is then followed by a practical assessment using the CrewSafe app. This app. takes the assessor through a checklist of how to assess an operator's competency, it also involves the video recording of task completion.

All training and assessment data is recorded and can be anonymously aggregated to see where gaps in the industry exist. Individual participants have a unique learning profile and can receive customised refresher training through their login profile.

This program aims to make drivers and their employers aware of the knowledge and skills gaps that exist and to substitute or replace them with sound knowledge and understanding of the crane, how it operates in certain circumstances and how to mitigate the risk of an adverse event.

Outstanding Solution

On 1 December 2022, CICA's On-Road Articulated Steering Mobile Crane Training Course won the award for **Outstanding Solution for Members managing WHS Risk** in SafeWork N.S.W. Work Health and Safety (WHS) Excellence Showcase, which



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recognises businesses and individuals for excellence in work health and safety.

While we celebrate this achievement, we are also acutely aware that the reason this course came about was because of a coronial recommendation.

Crane safety is serious, the fact that most pick and carry crane operators have never been properly trained or assessed, is deadly serious.

This is why CICA is offering 100 free sign-up's to the online component of the course to get you started (saving you \$250). To qualify, you must complete all aspects of the training and assessment with 18 months of sign up.

To find out more about the CICA On-road Course, click [here](#). To receive your code for the free sign up send Paul an email (paul@cica.com.au). To start the course, [click here](#).

Stay Safe - CICA