

LIFTING MATTERS

ADVANCES IN CRANE TECHNOLOGY WITHIN THE INDUSTRY AND BEYOND

THE INNOVATORS IMPROVING
EVERYDAY SAFETY OUTCOMES



EDITION 21

Thanks to this
edition's contributors



CALL FOR CONTENT

We want to hear from you.

Are you an aspiring author? Are you passionate about the safety of your workmates? Do you have an idea for improving safety or efficiency in your workplace? We want to hear from you.

Contribute to Lifting Matters' vision of a safer industry by submitting your ideas and articles to editor@liftingmatters.com

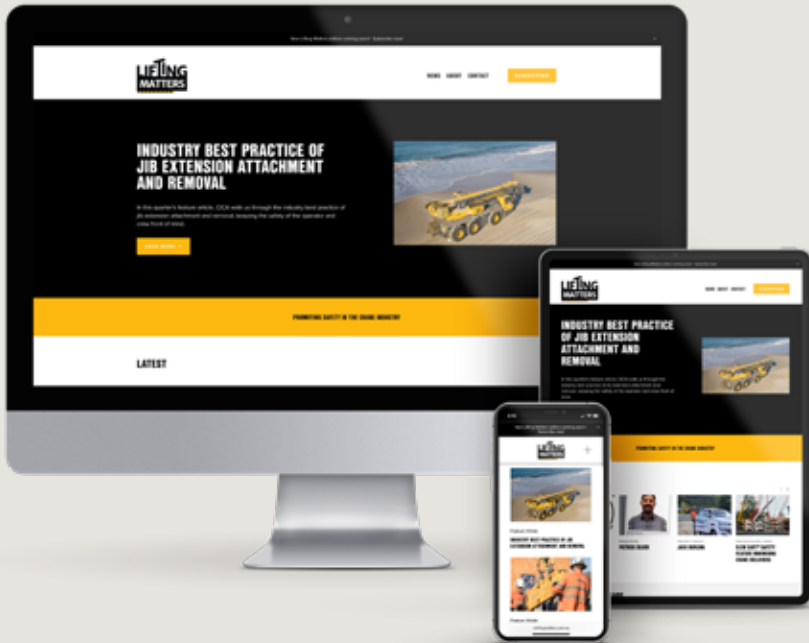
We are seeking stories about recurring or significant incidents, any prevalent issues, ideas about safer and more efficient ways of working, important reminders, or anything else relating to safety in the industry.

You can either submit a full article (from 200 to 1000 words), or let us know what you would like to read about in future issues of Lifting Matters. If you're from a business, we will mention you as a supporter and publish your logo at no cost to you.

We can't wait to hear from you!

STAY UP TO DATE

Visit our website to read current and previous articles.
You can subscribe for up to date content or
submit an article for next edition as well!



LIFTINGMATTERS.COM.AU

FROM THE EDITOR

EDITION 1



2022: here we are! This year, we have decided to focus on bringing you two outstanding issues of Lifting Matters. So, moving forward, we will be issuing the magazine twice per year, once in March/April and once in September/October.

Never fear, you will still be able to access plenty of Lifting Matters content on our NEW WEBSITE. We are excited to launch our brand new site, designed to highlight online articles and provide a catalogue of prior issues for download. Check it out at liftingmatters.com.

In this issue, we are revisiting the role of technology in the crane industry. Since we last explored the topic in 2018, industry innovators have developed numerous ways to leverage technology

for safer outcomes. Whilst we don't have the data on the quantifiable differences these technologies are making, we know the positive impacts are felt throughout the industry - like the number of overhead power incidents the 'Look Up and Live' app has prevented, or how many potential instabilities Crane Anti-Swing Technologies have avoided.

Sound interesting?

Well, read on to get more information on these innovations, plus insights into other advances making an everyday difference in the safety of our people.

If you prefer printed glossy copies for your crane cabs, cribs, mess hall, or reception, please send your postal address and the number of copies you require to editor@liftingmatters.com.

Lifting Matters is available to view at www.liftingmatters.com.au or you can subscribe to receive an email copy each quarter.

Stay safe, and see you next edition!

A handwritten signature in black ink that reads "Dashelle".

Dashelle Bailey, Editor
editor@liftingmatters.com

CONTENTS

FEATURE ARTICLE

- The smarts taking our industry to new levels of safety performance 6

INDUSTRY INNOVATION

- Crane Anti-Swing Technologies 14

INCIDENT REPORT

- Victoria, Australia 20
Auckland, New Zealand 24
Earlwood, Australia 26

SPOTLIGHT ON

- Look up and LIVE 29
Tadano technology innovations – IC-Remote and IC-1 Plus, Control Systems that optimise performance and versatility 32
CICA's Outrigger App 36
Multiplex sets the new benchmark for crane operations with the use of Roborigger 40

OPERATOR'S OPINION

- Kingys Diesel Industries 42

PEOPLE PROFILE

- GoUpSafely - High voltage proximity sensing for heavy machinery 44

TRAINING & DEVELOPMENT

- 7 Crane Operator Skills You Can Practice On A VR Crane Simulator 46
Come in VR: Revolutionising professional training 49
Mobile Crane Simulator 52

HEALTH & WELLBEING

- We need to talk about mental health in the construction industry 56



INNOVATIONS IN CRANE TECHNOLOGY AND BEYOND: THEN AND NOW

Author: Albert Smith

Cranes have been around since the Ancient Greeks, yet we are still finding ways to enhance, modernise and revolutionise this simple piece of machinery. For such an old piece of machinery, I am amazed at the engineering solutions and technological innovations that continue to offer opportunities to advance as an industry, particularly in keeping our people safe. I wrote an article for Lifting Matters about crane technology in 2018, and already there have been many advancements which I will touch on in this article.

“

Approximately 67 machinery operators and drivers were involved in worker fatalities in 2020-2021.



Universal Cranes using Liebherr remote.

THE DATA

We are developing a safer and more productive industry through technology such as remote automated operations, robotics, VR training and digital procedures generated in programs. However, with more than 194 serious incidents recorded in Australia in 2020-2021, we still need to improve as an industry. Approximately 67 machinery operators and drivers were involved in worker fatalities in 2020-2021. Although these numbers have decreased by 50% from the peak in 2007, we have a responsibility to work towards reducing

those 194 serious incidents per year to zero. The crane industry must work together to eliminate the challenges and incidents that arise in lifting operations. If we can leverage advances in technology, we have an opportunity to improve site conditions, cut down lifting cycle times and improve safety outcomes.

So, what technologies and innovations are available? And how should we be using them to provide a safer workplace and better safety outcomes?



LIEBHERR LEADING THE WAY

Technology can't be discussed without mentioning Liebherr, who lead the charge in manufacturers introducing new technology into production model mobile cranes. Over the years, they have added many innovations and enhancements to their cranes to maximise performance and ensure safer working conditions.

Recent innovations include:

- ▶ Battery-powered crawler cranes – The innovation that I am most excited and intrigued about are the Liebherr Battery-powered unplugged cranes. Developed in 2020, the LR 1200.1 and LR 1250.1 were the world's first battery-powered crawler cranes. Battery-powered means these machines are zero-emission, quiet in operation and can last up to 4 hours. This technology provides sustainability and environmental benefits and allows the cranes to operate in areas that are sensitive to noise and require environmental considerations. This technology will undoubtedly continue to evolve and be integrated into more cranes and mobile vehicles.
- ▶ LICCON computer system - In 2007, Liebherr released the Liebherr Computer Control (LICCON2) to the market. This technology enables crane movements to be controlled safely from outside the cab with



With the aid of Bluetooth technology, a crane driver can remotely control the majority of crane setup and crane operation.

greatly improved visibility. With the aid of Bluetooth technology, a crane driver can remotely control the majority of crane setup and crane operation. Since then, many iterations have come about as the team continues to work on developing the control's architecture to meet the ever-growing demands of the market.

- ▶ BTT Remote control – The BTT features a display and function keys making it possible to level the crane, start and stop and adjust the engine speed automatically and remotely. All cranes with the LICCON2 are integrated to work with the BTT and can work on all crane types, from the LTM 1030-2.1 to the LR 13000.
- ▶ Rear axle steering - The front axles are steered mechanically via the steering wheel. The rear axles are electrohydraulically actively steered depending on the steering angle and speed.
- ▶ Vario-Ballast and Vario-Base – In 2013, Liebherr introduced the Vario-Ballast and Vario-Base feature to many machines. Using

standard mechanically adjusted ballasting cylinders, Vario-Ballast features an easily adjustable counterweight radius. This solution enables flexible use for constricted conditions and large radii. An update in 2018 to the Vario-Ballast was the VarioTray ballast system, allowing the simple unbolting of the central section of the suspended ballast. This unbolting technology allows for faster, safer work on site. The Vario-Base enables each individual crane support to be extended to an arbitrary length, allowing for safe crane operation in construction locations. This innovative technology enables teams to enter tighter spaces in a safer way. I still believe this technology is relevant and important to note, and I look forward to seeing developments and enhancements to both the Vario-Ballast and Vario-Base.

All of these features significantly improve the capacity, productivity, and safety of mobile cranes and will become standard features of all mobile cranes over time.

The crane industry must work together to eliminate the challenges and incidents that arise in lifting operations.



TAGLINE TECHNOLOGY

I'm proud and excited to share two Australian companies, Roborigger and Verton, who have utilised technological savvy and safety initiative to develop devices that eliminate the risky business of hanging loads and taglines.

Roborigger, the crane automation start-up, is featured in this edition of Lifting Matters, so I will elaborate on Verton. Verton is a Brisbane-based technology company that developed the world's first remote-controlled electromechanical under hook load rotation system. We worked with Verton in 2018 to provide a solution to remove and replace a chiller unit situated on the 28th floor of a popular and centrally located hotel in Brisbane's CBD. The device, R-Series, is remotely controlled, improving safety outcomes by removing Riggers from the lift zone.

Universal Cranes' rigging solution incorporated the R-Series spreader, which enabled the Riggers to stand clear of the suspended load using a mobile device with a user-friendly interface and focus on making critical in-flight lift decisions. At approximately 90m from the ground, controlling the rotation of the load would be difficult, but with R-Series, the loads were able to be lifted from and delivered to precise GPS coordinates.

Verton's work in under hook device R-Series is an excellent example of technology aiding crane safety and compliance.

Since 2018, they have brought out more products that have helped solve lifting issues, such as:

- ▶ Everest series – A remote-controlled load management system including a variety of different gyroscopic modules -
- ▶ Verton dashboard – Allowing machine connectivity for data visualisation & insights
- ▶ Windmaster – Remote-control load-management system for wind turbine installations
- ▶ Pipe handling solution – Verton and Global Gravity partnered to create an all-in-one solution for a tubular transport and running system. Combining Verton's Everest Series with Global Gravity's TubeLock, this technology allows a single rigger to be operated safely and from a distance.

Verton's products negate the need for human held taglines and for workers to stand under loads. Similarly, Roborigger

eliminates taglines and labour fatigue with their Roborigger units, wireless release hooks, and specialised spreader and lift frames. They also provide valuable data and analytics through their cloud-based IoT customer platform.

We've always had strict and safe labour protection laws, and our nature to 'just do it' means Australia can be at the forefront of safety and innovation in this space. That's the Aussie spirit!



“

Maxspeed is an automation that adjusts the speed drives to deliver unmatched control speed and direction.



CRANE AUTOMATION

Crane automation is not new, and manufacturing industries have led the charge in integrating automation. We are seeing automation in overhead cranes, rail-mounted gantries and cranes in warehouse automation.

Fully-automated gantry cranes are revolutionising the maritime industry and container handling practices.

This has improved safety outcomes for the personnel involved in these works and facilitated the elimination of manual handling.

For example, Toshiba Mitsubishi-Electric Industrial Systems Corporation (TMEIC) cranes control system, Maxspeed automatically adjusts the speed drives to deliver unmatched control of speed and direction. Used in gantries, trollies, cable reels and hoists, this system offers faster reaction time and increased productivity. Whilst we can implement automation such as this into industries that involve standardised and repetitive processes, we are yet to fully harness remote operation and/or automation software capabilities when it comes to more diverse and complex construction activities.

IN SUMMARY

Our company is about to embark on an exciting venture in the Wind Industry. Across Australia and beyond, onshore and offshore wind farms have experienced unprecedented activity. There are already 105 renewable energy projects under construction in Australia. We are looking at ways to innovate using craneage for this industry, which often faces remote and restricted site challenges, and it's an area that we will continue to explore into the future.

In this edition of Lifting Matters, I hope to see many more innovations and safety initiatives shared across the industry. By simultaneously improving productivity and focusing on the safety and well-being of our workers, we will not only thrive as an industry but prepare ourselves for the future of construction.



CRANE ANTI-SWING TECHNOLOGIES

Author: Richard Skiba - LRES Training Management

Cranes come in various forms, and most work by using wire ropes to suspend loads subject to swaying. This method of operation can restrict the working efficiency of the crane and cause accidents. Overhead cranes and gantry cranes are particularly subject to load swing. Due to the flexibility of the wire ropes, loads will sway with crane motion or external disturbances loads, and active and passive methods are implemented to carry the load to the desired position.

Preventing and eliminating crane load sway is a technical difficulty that people have been eager to overcome since the creation of cranes. Thankfully, the advancement of electrical control technology, particularly the application of advanced programmable controllers and variable frequency speed control technology, provides a unique opportunity to tackle this issue.

LOAD SWING (OR SWAY)

The load's swaying is a type of simple harmonic vibration. When the load lifted by the crane begins to sway, it must be gradually eased, which can be time-consuming and decrease operating efficiency. Swaying can also cause safety issues when carrying loads of great mass. The swinging presents a hidden danger to the load itself, the surrounding goods, and the personal safety of the field operators. The operator, controlling a critical or easily damaged load, must anticipate the load's motion while it is swinging dangerously from side to side.

When working with a swinging load, the crane operator must constantly divide their focus between manoeuvring the crane and reducing sway. With an inexperienced operator, the risks to people, products, and equipment are significant. As confirmed by a study conducted by Konecranes using data from OSHA, more than 37 percent of crane-related accidents happen due to unbalancing while swaying the load.

Even with an experienced operator, productivity can be dramatically reduced due to the requirement to slow the travel speed in anticipation of the swinging and waiting for the load to stop swinging before lowering it.

Using conventional crane and trolley motion controls, the load suspended on the hook will pendulum due to travel acceleration or deceleration. As

depicted in Figure 1, a typical overhead crane is a 3-axis piece of equipment with a bridge (X-axis), trolley (Y-axis), and hoist (Z-axis). The load is suspended by cables from a moving trolley and acts similarly to a standard pendulum.

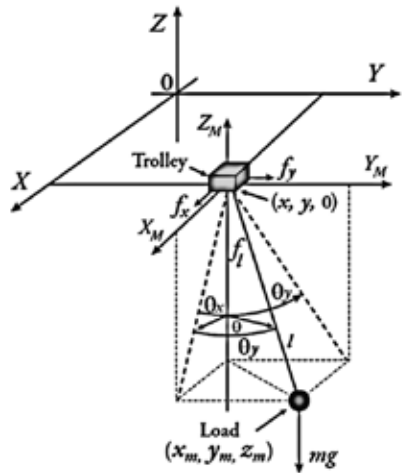


Figure 1 - Bi-axial swing of the load caused by the simultaneous motion of both trolley and bridge, adapted from Cho, Sung-Kun, and Ho-Hoon Lee. "An Anti-Swing Control of a 3-Dimensional Overhead Crane". Proceedings of the American Control Conference, Chicago, IL June 2000.

When shifted to an initial angle and released, the pendulum will swing back and forth with periodic motion until it is subdued by gravity or other external forces. The pendulum period is the time it takes to complete one full swing. Under certain conditions,

such as when long slings or a lifting attachment are used, the pendulum dynamics become complicated by the creation of a double pendulum effect.

A sway control system (SCS) can be developed if the following variables are known: Acceleration rate of the trolley or angular displacement of the load caused by the trolley motion; Acceleration rate of the bridge or angular displacement of the load caused by the bridge motion; and, Distance to the centre of gravity of the load (L1) plus the C.G. Offset (L2) to compensate for slings, attachments or large loads.

SWING CONTROL MECHANISMS

Sway control on a crane allows operators to use full speed commands for all movements, resulting in shortened cycle times. Field testing has shown that a crane with sway control can improve productivity by 25 to 50 percent. A properly designed and adjusted sway control system can reduce load sway by 85 to 95 percent. As a result, sway control systems can significantly improve the production efficiency of crane use, improve the safety of its use, and reduce the risk of damage to loads and injury to personnel. A further benefit lies in the reduced point of operation, thus extending the crane's service life.



Sway Control works by stabilising the load during trolley traverse and/or bridge travel motions. This smart feature works automatically, allowing the operator to accelerate and decelerate the crane as required while minimising the load's sway.

Sway can be controlled either passively, such as through the crane operator, mechanical guides and anti-sway reeving, or actively with an electronic system, including Closed Loop with Optical or Inertial Feedback and Open Loop systems.

CONTROLLING LOAD SWING PASSIVELY

A crane operator has numerous methods to manage a swinging load. One is to place the burden precisely over the goal position, then wait until the sway dampens to an appropriate level. Another technique is to pick up the load and move it at a rate at which sway never occurs. Both methods are viable, but they are also inefficient and slow down productivity.

Some experienced crane operators are able to place delicate loads manually in short order and control load movement using only standard control switches and specific techniques where they rapidly reverse the crane and trolley motors to develop reverse torque. This slows or even stops the crane. In addition, a drift point is often used on the motion control unit to

release the electric brake, allowing the bridge or trolley to coast until it is stopped by friction or the foot brake.

Highly skilled, experienced crane operators counter sway by driving into the swing to dampen it. After lifting the load, the operator starts the crane slowly to gauge how the load sways. If the operator momentarily stops or slows the crane and waits for the load to swing forward, they can again start the crane



Sway Control works by stabilising the load during trolley traverse and/or bridge travel motions.

moving at the same speed as the load once it is directly under the trolley. The operator repeats this manoeuvre until achieving the desired speed. When the load approaches the target position, the operator reduces the speed, drifts, or even applies a negative braking force (reverse plug), thus inducing a forward swing. As the load approaches the target position, the operator increases the speed slightly to place the load point on the trolley above the target position.

These manoeuvres are complicated and dependent on both the operator's skill and the speed and acceleration of the crane. It is also affected by the responsiveness of the crane's control system.

Mechanical guides can also be used to minimise sway. A structural frame mounted to the underside of the crane is typically used in conjunction with a guided load bar or hoist to limit vibration and aid positioning. This type of mechanism is generally used in dipping operations. However, the guides and guide mechanisms are expensive, add weight to the crane, and exert a bending moment on the crane structure.

Various anti-sway reeving systems have also been developed to stabilise loads, commonly used on container handling cranes.

Most involve diagonal reeving and a spreader bar. These systems tend to be complex, require additional headroom and more maintenance, and are more expensive than most electronic means of sway control.

CONTROLLING LOAD SWING ELECTRONICALLY

Closed-loop systems typically include feedback from a high-resolution Load Position Sensor consisting of a camera

mounted on the trolley and a reflector target mounted on the load block or spreader. The camera records images directly below, including the location of the target. From these images, the position of the load relative to the trolley can be determined by an image processor and then reported back to the pendulum controller.

These systems correct the actual sway in real-time and, in contrast to systems with an open control loop, can correct for existing initial sway and sway induced by external forces such as wind or picking up an off-centre load. However, such feedback systems tend to be a little slow because they are reactive rather than predictive. Their cameras, defoggers, complex reflector mechanisms, high-intensity lights, and image processors required to determine sway also make them more expensive than other methods. Other closed-loop electronic systems may use inertial feedback from accelerometers and/or gyroscopes to measure sway.

In open-loop systems, sway control uses an algorithm that dampens load sway fluctuations by controlling the acceleration and deceleration of the bridge and/or trolley movements through the crane's adjustable frequency (AFD) motion controls. The system generally changes the frequency converter's output frequency to attenuate the system's harmonics. In essence, it modifies the command signal to the system so that all movements,



These manoeuvres are complicated and dependent on both the operator's skill and the speed and acceleration of the crane.

regardless of length, are fluctuation-free. As such, the controller reduces oscillation in a predictive manner.

PaR Systems' EXPERTOPERATOR™ is a hardware module that intercepts pendant commands, modifies them, and issues the modified commands to motor drives. Konecranes DynAPilot system uses load height information integrated with the driver's controls to calculate the optimal acceleration path.

The open-loop system is similar to the approach used by experienced crane operators. The crane is accelerated to bring the load into motion, a constant speed is maintained for a short interval to allow the load to catch up, and the process repeats several times until the commanded speed is achieved without sway. The crane is decelerated and stopped similarly.

CONCLUSION

Anti-Sway technology is a very popular safety upgrade in crane modernisation projects. A sway control system can improve productivity by allowing the

crane operator to focus on engaging and disengaging the load rather than on minimising load oscillation. An SCS can also improve load distribution accuracy and reduce material damage caused by accidental contact with vibrating loads. Most open-loop sway control systems available on the market today are based on the dynamics of a simple pendulum and dampen load swaying using algorithms that continuously adapt the acceleration/ deceleration profiles of the bridge and trolley adjustable frequency drives.

When choosing an SCS, systems that offer the crane user the highest level of safety, functionality, simplicity, flexibility, and efficiency should be considered. Open-loop systems have an economic advantage over mechanical means. Closed-loop systems with feedback are best used in outdoor systems with high cycles, such as container cranes exposed to external influences such as wind, justifying the higher acquisition and maintenance costs.



VICTORIA, AUSTRALIA

12.04.21 | 27.04.21 | 30.04.21 | 04.05.21

Project	Equipment	The Outcome
Various jobs across Victoria	Crane truck, grain auger, tipper truck and excavator	Each of the listed incidents resulted in serious injury, substantial costs and reputational damage. Human error is common factor in all these incidents.

Key Learnings

PROTECTIVE ENGINEERED SAFETY - WORKING SAFELY WITH HIGH VOLTAGE ELECTRICITY

Each year, roughly 2100 deaths result from powerline incidents with 60% of these Each year, powerline incidents result in roughly 2100 deaths, with 60% from contact (or close contact) with powerlines by heavy machinery. That equates to 1250 preventable deaths per year through innovative technology that is currently available.

For example, in a stretch of 3 weeks in 2021, four incidents involving heavy machinery hitting power lines were recorded in Victoria. These incidents were all preventable using Protective's engineered safety solution, GoUpSafely™.

INCIDENT TIMELINE:

12 APRIL 2021

On Monday, 12 April 2021, the arm of a crane truck offloading building material hit high-voltage powerlines in Dromana. Two men were injured, and one was left in a serious condition in hospital.

27 APRIL 2021

On Tuesday, 27 April 2021, a man was left in critical condition after the grain auger he was transporting hit high-voltage powerlines at a property in Harston, southwest of Shepparton. The man received a severe shock and third-degree burns after the grain auger being towed by a forklift on which he was standing hit one of the bare overhead powerlines above. The man was airlifted to the Alfred hospital.

30 APRIL 2021

On Friday, 30 April 2021, a tipper truck hit a high-voltage powerline at Trafalgar South, with the driver taken to hospital in a stable condition.

4 MAY 2021

On Monday, 4 May 2021, an excavator sitting on top of a truck made contact with high-voltage powerlines in Pakenham, in Melbourne's southeast. The truck driver was placing ramps on the truck at the time, and consequently received a shock. A workmate quickly carried out CPR to revive the driver before he was taken to the hospital in a critical condition.

These incidents resulted in serious injury, substantial costs and reputational damage, with human error the common factor in each. The GoUpSafely™ solution from Protective significantly reduces the human error factor, ultimately saving money, reducing costly productivity loss and, most importantly, protecting human lives.

This Australian owned and designed technology provides indication alarms and optional motion-stop technology offering safer working conditions when operating near high voltage electricity sources, keeping personnel and machines safe.

Protective's patented GoUpSafely™ (GUS™) system comprises one or more wireless E-field sensors coupled to a Base Controller. The system is designed to detect the proximity of energised overhead AC 50Hz or 60Hz electrical transmission lines, preventing inadvertent contact with hazardous and potentially lethal voltages. GUS™ was

created to stop machinery from coming into contact with energised overhead high-voltage transmission lines when a dangerous situation is detected. This is achieved by stopping the machine in the current direction of movement and only allowing movement away once the hazard is cleared.

The sensors are capable of detecting E-fields surrounding energised distribution and transmission lines. They are mounted strategically on the boom of a crane or onto an elevated area of the basket or boom of an elevated work platform. Each sensor is paired to and communicates with the Base Controller, which can be hard-wired into the machine's control system. Depending on the application, the Base Controller can either directly control hydraulic solenoids utilising solid-state switching or use a J1939 CAN Bus connection. 'Indication only' versions are also available, should this be the most suitable configuration for the working environment.

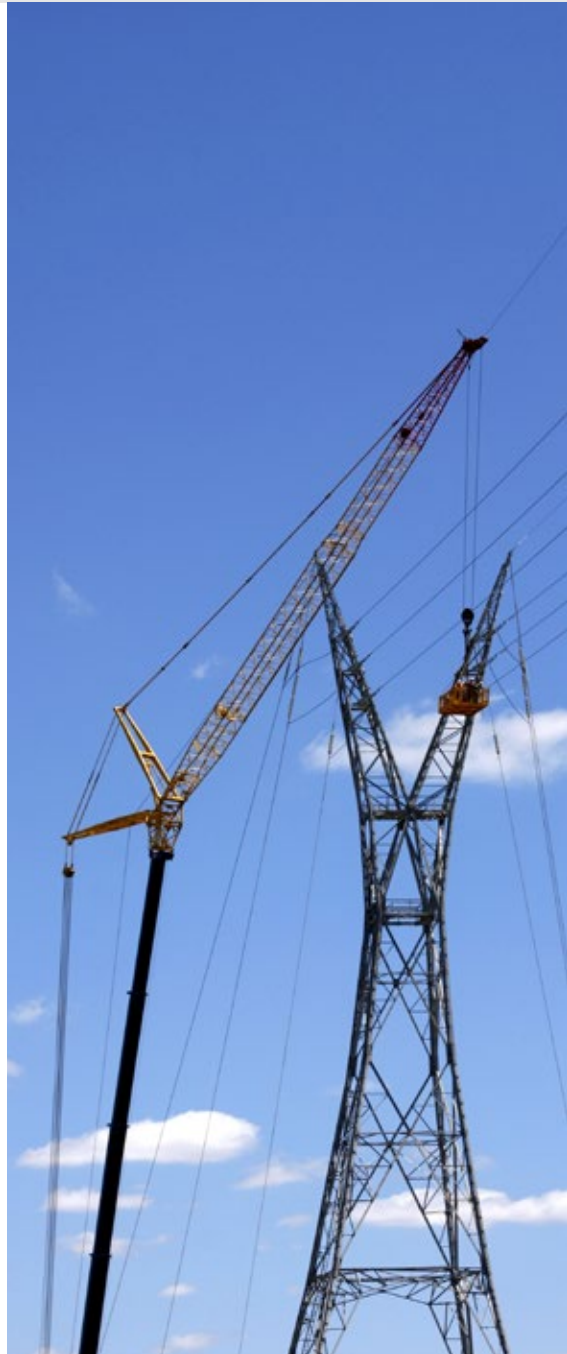


The system is designed to detect the proximity of energised overhead AC 50Hz or 60Hz electrical transmission lines, preventing inadvertent contact with hazardous and potentially lethal voltages.

When a sensor detects the proximity of a high-voltage transmission line, it illuminates inbuilt lamps to indicate the level of the hazard and transmits its status to the Base Controller. The Base Controller disables further movement towards the risk, allowing only a single opposite movement to 'back out' of the hazardous area. Movement in any other direction is typically inhibited, but the system allowances can be configured to customer requirements.

GUS™ is easily retrofitted to all cranes and most aerial machines. When a GUS™ system is correctly installed, calibrated and commissioned, it is virtually impossible for an operator to invoke movement resulting in contact with an energised electrical transmission line.

For more information on GoUpSafely™ (GUS™), visit: www.protective.net.au/go-up-safely



AUCKLAND, NEW ZEALAND

DECEMBER, 2017

Key Learnings

OVERHEAD POWER LINES: ELIMINATING RECURRING FATAL ACCIDENTS

- ▶ Construction site under 110 kV lines
- ▶ Crane boom made contact with bottom conductor
- ▶ Severe electric shock resulting in burns to the lower legs of one worker
- ▶ Damage to Transpower's assets, the crane and delivery truck

In December 2017, an Auckland Cranes Kato SR250 Rough Terrain Crane was involved in an incident where a winch rope made contact with high voltage power lines. The crane operator slewed the crane through an exclusion zone, causing the rope to come into contact with 110kV powerlines. The connection caused the electricity to earth in two ways:

1. Via the rope and load to ground. Fortunately, there were no fatalities, but a worker (dogman handling load) received a severe electric shock and was hospitalised with burns.
2. Via the rope and crane, across to the nearby truck and then to ground. Significant damage was sustained by the equipment.

The crane operator and truck driver (both in cabs) were unharmed, but the dogman handling the load received a severe electric shock and sustained burns to his lower legs. Emergency protocols were followed, and first aid was administered on-site while an ambulance was called. The injured worker was then taken to hospital for further treatment.

In this particular incident, all other workers escaped injury. However, the equipment and vehicles on site sustained significant damage. The earthed electricity destroyed Transpower's assets and the crane and the panel transportation truck and trailer, with the tyres, electronics and lights blown out on both vehicles.



Tyres, electronics and lights were blown out on the crane and delivery truck.

Investigations began immediately after the incident occurred. Auckland Cranes performed a thorough internal inquiry alongside external scrutiny from Transpower, WorkSafe NZ, and others. After an extensive investigation, WorkSafe announced they would not take any further action at that time. Auckland Cranes' internal inquiry has led to several lessons learned within the organisation.

It is essential to understand the potential consequences of an incident such as this. A crane coming into contact with high-voltage lines is often complicated by the fact that electrical isolations are required, meaning there could be a significant wait time (up to 3 hours) before emergency services can approach to assist and rescue. Also, since electricity can be conducted through the earth, it is not just the crane operator or those directly under the power lines who are at risk. Anyone in the immediate area can also receive a shock, especially if standing with feet

apart or walking. In such circumstances, it is best to quickly “shuffle” away from the area with small steps.

The formal advice from Transpower in New Zealand is to keep at least 4 metres between your equipment, boom, load and powerlines at all times. Any mobile equipment operating near powerlines is required to carry a warning notice in a location visible to the operator.

If you are in New Zealand and have any questions, contact Transpower Landowner Liaisons for your area (Google Transpower Landowner Liaison contacts). Transpower is working with local councils to minimise further building under overhead powerline corridors, to eliminate the need for contractors to work under or near overhead power lines.



EARLWOOD, AUSTRALIA

APRIL 2018

KEY LEARNINGS

OVERHEAD POWER LINES: ELIMINATING RECURRING FATAL ACCIDENTS

An incident in southwest Sydney in April 2018 provides a sober reminder that electrical hazards can affect both site workers and the public in the site vicinity. A crane operator was unloading a truck on an Earlwood worksite earlier this year when the crane boom struck a high voltage power line. The impact caused the high voltage line to fall over, and the live lines fell onto a ute occupied by a man unrelated to the worksite.

The crane operator was left in critical condition as the electrocution was so severe that he experienced cardiac arrest, and his heart had to be restarted by paramedics. Fortunately, the paramedic arrived just six minutes after the emergency call was made and saved the operator's life.

The second man was trapped in his ute for several hours, waiting for the lines to be de-energised. He was found to be uninjured when assessed by paramedics.

Lifting Matters was unable to uncover further detail on the incident,

including information on the incident investigation findings. Photos of the site indicate that a failure to establish an exclusion zone around the power lines may have contributed.

The potential consequences of these events can be frightening, but fortunately, there are organisations that provide advice and ample information on addressing electrical hazards. All of these incidents could have been avoided had the teams utilised technologies that aid in mitigating electrical incidents and hazards.



In this edition, we feature the **Lookupandlive.com** app. This app has received many innovation and safety awards and recently received the Safety Excellence Award at the Australian Workplace Health and Safety Awards in 2021. It's important to note that the safe working distance from power lines varies from state to state and between countries, so it is recommended that you contact your local electricity provider for advice on your specific site circumstances.



Glen Cook, Winner of Queensland Community Achievement Awards (QCCA) Synaco Safety Award 2021

Presented by Mike Otty, Managing Director, Synaco Global Recruitment

A large advertisement for the 'Look up and Live' app. The background is a photograph of a yellow industrial structure, possibly a crane or conveyor system, with a bright light source at the top. In the foreground, there is a yellow rounded rectangle with the text 'Look up and Live' in bold black letters. Below this, there are two black buttons: one with the Apple logo and 'Download on the App Store', and another with the Google Play logo and 'GET IT ON Google Play'. At the bottom left, there is a white text box with black text. At the bottom right, there is a portrait of Glen Cook and a QR code.

Look up and Live

Download on the App Store

GET IT ON Google Play

Accidental contact with powerlines can kill instantly. Australian Work Health & Safety Professional of the Year, Glen 'Cookie' Cook put powerline safety laws into easily understood terms . Engaging will all levels of your business, executive leaders, senior managers project managers, engineers, project managers, designers, planners, machinery operators and field staff. Cookie also demonstrates the features of the award winning lookupandlive.com app.





LOOK UP AND LIVE

“Look up and live”, a notable quote when it comes to powerline safety all over the world. It is easy to say, but in practice it can be difficult for workers to see powerlines and recognise the danger.

“I knew that powerline was there, I just didn’t see it!”

I hear this phrase almost every day from workers who have been extremely lucky to survive accidental contact with overhead powerlines. Usually the machinery is not so lucky, with tremendous damage to the tyres, hydraulics and electrics of the vehicle.

WHY?

Why do these incidents occur so regularly when the powerline infrastructure is so visible, and why don’t people see them? Have you ever missed seeing a cyclist when arriving at an intersection? Why didn’t you see them? Were you looking for vehicles, or a cyclist? Despite what most people think, our eyes do not



If you haven't identified what you are looking for it can be easily overlooked. This is known as 'inattention blindness'.

work like a video camera capturing everything and sending that information to our brain. If you haven't identified what you are looking for, it can be easily overlooked and is known as 'inattention blindness'. Inattention blindness occurs when the brain is focused on a specific task and misses an obvious hazard, such as powerlines.

ADEQUATE PLANNING

Let's talk about underground powerlines. Underground powerlines are not visible, but are damaged far less often. Why is that? Because we cannot see them we formulate a careful plan to work near them using planning tools like Dial Before You Dig. Creating a simple plan that identifies the hazard significantly reduces the chance of accidental contact.

So, what happens for overhead powerlines? Most businesses rely on workers to see the powerlines and identify the hazard when they arrive onsite. This is when inattention blindness comes into play, blocking the obvious hazard to the worker until it's too late.

The Lookupandlive.com app has assisted businesses and workers in planning work near overhead powerlines. For example, construction companies can now investigate what powerline hazards will be on-site at the planning stages and what controls, such as relocating or undergrounding of powerlines, may need to occur without holding up works. Firefighters and emergency service workers can also use the lookupandlive.com app to identify voltages and powerlines and increase situational awareness of electrical hazards.

The app also assists Agricultural or construction businesses in requesting rotamarkas (powerline markers) to highlight lines for high plant/equipment and aircraft.

Rotamarkas combat inattention blindness due to their constant spinning movement, as our eyes are drawn to action, highlighting the powerline hazard to machinery operators and pilots.

The lookupandlive.com app has been a successful innovation in Australia, with utilities in many states now sharing their powerline spatial data.

The app has been accessed over 100,000 times in the last year, and there have been 20,000 downloads of the app to devices.





TADANO TECHNOLOGY INNOVATIONS – IC-REMOTE AND IC-1 PLUS CONTROL SYSTEMS THAT OPTIMISE PERFORMANCE AND VERSATILITY.

March 2022

Tadano's products and technologies play a vital role in constructing everything from high-rise office buildings and highways to environmentally friendly wind turbines and our homes. With Tadano's mission to be #1 worldwide in the Lifting Equipment Industry, they are always searching for innovations that will assist in providing solutions to increase efficiency and productivity. Below are two examples of Tadano control systems that add versatility and flexibility through live crane capacity determination, multiple asymmetric outrigger setups, advanced data monitoring, troubleshooting, and more.



IC-1REMOTE

An advanced telematics solution that provides real-time, cloud-based data views that increase job planning efficiency, allow for remote troubleshooting and reduce downtime.

Having accessible and relevant operating data regardless of location is imperative for proper crane fleet management, service planning, and remote troubleshooting. The IC-1 Remote advanced telematics solution – a cloud-connected radio unit with a SIM card – provides a wide variety of real-time

data views via an Internet browser.

The cloud-based data helps you make more profitable investments, increase job planning efficiency and reduce downtime through improved service planning. The IC-1 Remote is available as a field retrofit kit for various all-terrain and crawler crane models, and the Tadano Customer Support always stands ready to provide expert assistance.

This system is able to create reports that outline crane status, usage and history of activity, including downtime. Below are examples of the type of data that is accessible via the IC-1 Remote system:

- ▶ Crane Current Location
(Includes during transit)
- ▶ Fleet Location overview
- ▶ Operating Hours
- ▶ Current Crane Configuration
- ▶ Error codes
- ▶ Fuel consumption and alarm configuration
- ▶ And many more

IC-1PLUS

The IC-1 Plus control system adds value to your crane by further increasing its flexibility, enabling it to perform

more jobs. Live determination of the crane capacities, depending on the superstructure's slewing angle and the capacity radar, allows multiple asymmetric outrigger setups for work in confined spaces. Transport costs are reduced since less counterweight can be used compared with 360° capacities. Based on the field-proven IC-1 control system, the standard on Tadano cranes manufactured from Zweibrücken, the system offers efficient and intuitive touchscreen operation and stores all load charts.





Having accessible and relevant operating data regardless of location is imperative for proper crane fleet management, service planning, and remote troubleshooting.

The IC-1 Plus control system determines lifting capacities for every position of the boom subject to the superstructure's slewing angle. This enables you to use your maximum lifting capacity, especially when lifting over the outriggers. The effect is even higher with reduced outrigger settings and a reduced counterweight.

The ability to plan lifts through an onboard planning simulation allows easy and safe lift executions.

The IC-1 Plus control system features an enhanced visualisation to provide the crane operator with additional information on capacity in relation to boom position. This coloured visualisation of the work area capacity promotes efficient and safe use. Features include:

- ▶ Movement speeds reduced prior to auto shut-off
- ▶ Auto shut-off of movements prior to overload condition
- ▶ Visualisation of max capacity for +/- 30° slewing angle and luffing area (depending on boom length)
- ▶ Determined capacities visible on control screen.

Tadano recognises the importance of good and reliable hardware, as well as the significance of having the necessary software to enable the user and the crane to optimise useability and performance.



CICA'S OUTRIGGER APP

The Crane Industry Council of Australia (CICA) is continually looking for ways to implement new technologies that improve safety, ease the compliance burden and enhance efficiencies for crane users and owners.

OUTRIGGER APP

Ground giving way due to insufficient bearing capacity is a known engineering problem that crane company owners regularly face. Making calculations before setting up a crane is problematic due to the calculations' complexity and overall inexperience in the workforce, as highlighted through the 2018 SWA Regulatory review on crane high-risk work licenses.

To facilitate the accessibility of information required for safe crane operations, CICA Queensland commissioned the development of a free app, for use on smartphones and tablets, that will assist crane operators, riggers, and doggers in assessing ground



CICA has digitised the crane documentation that forms part of a crane operator's daily inspection checklist, and contains crucial information on functional and maintenance aspects of the crane.

conditions before crane set up. The calculations can be integrated into the Safety Management Plan to increase transparency and accountability.

The digitisation of ground pressure calculations aligns with the current and revised Queensland Mobile Crane Code of Practice.

CICA Queensland funded this tool's development and has made it available to everyone in the crane industry, not only in Queensland but internationally. Residential, industrial, commercial, and infrastructure projects all benefit from this calculation tool. Find it in the Google Play Store or Apple App Store by typing in 'CICA Calc'.

STARTSAFE

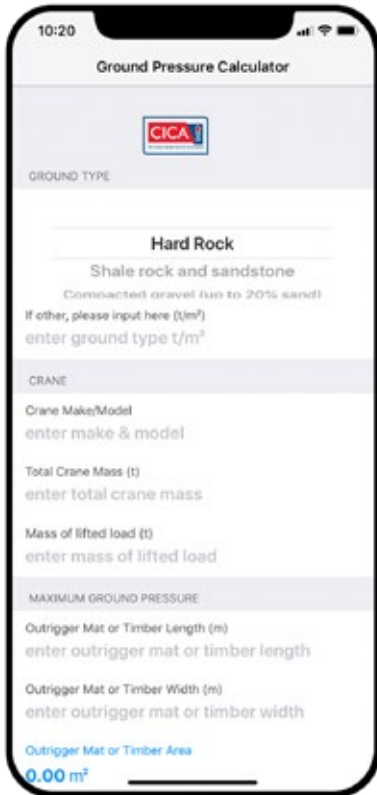
Before crane lifting begins, a pre-start inspection of the crane is essential to ensuring everything is operating as intended. Historically, paper pre-starts

have been used by most of the crane industry. However, these are limited in their application because they are not easily accessible, can be misplaced and can be difficult to follow up.

The Centre for WHS crane safety incident causation model identified poor crane maintenance and the operation of a substandard crane as pivotal factors in workplace incidents.

CICA has digitised the crane documentation containing crucial information on the crane's functional and maintenance aspects that form part of a crane operator's daily inspection checklist. StartSafe is available as an app, and the information captured from the pre-start can be sent back to the business and addressed by the maintenance team.

The beauty of StartSafe for a business owner is that it has unlimited potential and flexibility. There is scope within the



CICA has collated resources such as training videos and in-app guidance, and offer telephone support to assist users of StartSafe. Go to www.startsafe.cica.com.au for more information.

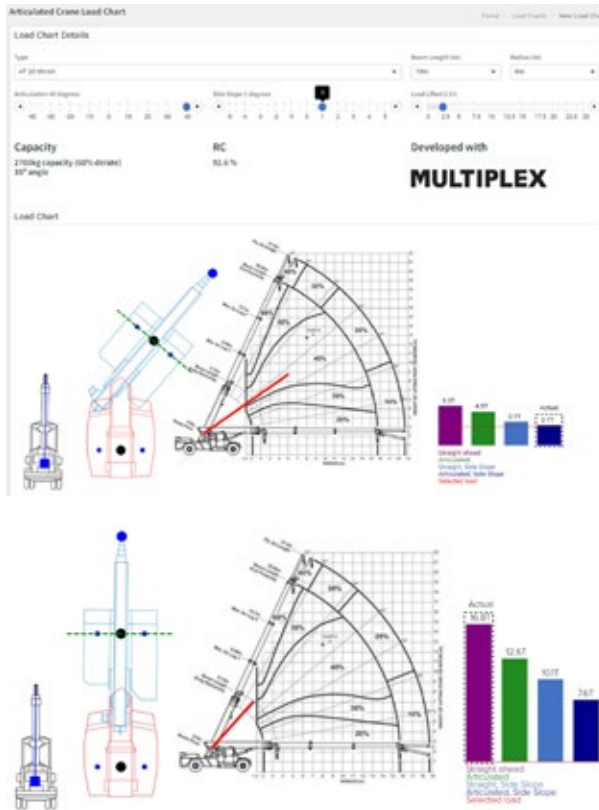
FRANNA SIDE SLOPE CALCULATOR

The Federal Safety Commissioner (FSC) hosted a webinar in November on lift planning. Stuart Edwards, Director of Edwards Heavy Lift and CICA Technical Committee Member, and Brandon Hitch, CICA CEO, shared the various types of lift plans and common shortcomings with over 400 attendees.

There needs to be confirmation that the crane, or cranes, are working within their rated capacities with all lift plans. The crane's rated capacity can vary significantly by its build configuration and the pick and placement location of the load. Furthermore, many cranes travel,

platform to add whichever documents the business wishes to digitise, and they are secured on the CICA member portal.

StartSafe provides confidence to crane owners and users that pre-start inspections are being completed to the highest standard. The data on the crane is also recorded, stored, and available to the business owner at any time, so that the complete history crane's condition is accessible from a single source,



or mobile, with the load suspended. Each of these variables must be considered to ensure the crane works within the relevant rated capacity.

Following the webinar, CICA posted a tool built in collaboration with Multiplex on their website to assist in calculating the side slope duration chart used for older Franna models. This tool takes the guesswork out of manually reducing the crane's rated capacity when on a slope greater than 0.57 degrees.

Access to the full webinar as well as the side slope calculator is available on the FSC website: <https://www.fsc.gov.au/blog/ofsc-webinar-lift-planning-crane-risk-management>



MULTIPLEX SETS THE NEW BENCHMARK FOR CRANE OPERATIONS WITH THE USE OF ROBORIGGER

Premier construction company, Multiplex, has focused on enhancing site safety and productivity across multiple projects by using Roborigger, an innovative automated lifting device. Multiplex's use of Roborigger over the past three years demonstrates how new technology can improve safety whilst delivering a quantifiable cost benefit.

INCREASE THE NUMBER OF LIFTS YOUR CRANE COMPLETES BY 15%

Data from construction sites has shown that a 15% improvement in crane performance can be achieved when combining the benefits of not having to attach and remove tag lines, completing the orientation of the load while it is in transit in the air, and the ability to lift high windage loads in stronger winds.

A similar improvement is also seen when Roborigger is used for vessel loading operations. One Roborigger user in Holland loads pallets of bricks onto a vessel and has reduced the average cycle time from 35 seconds to 30 seconds.

PUSH THROUGH TOUGH CONDITIONS AND GET THE JOB DONE FASTER

Evidence shows that Roborigger enables contractors to work through challenging conditions, allowing them to complete work on or ahead of schedule.

Instead of shutting down on windy days, Roborigger allows work to continue for longer as total control of the load can still be maintained.

Multiplex used a 15-tonne capacity AR15 Roborigger during the construction of the Australia 108 building in Melbourne (the highest residential tower in the southern hemisphere). Roborigger was used to lift the golden "starburst" external façade panels weighing 8 tonnes to the 88th floor. The system stabilised the long and heavy panel during the lift, eliminating the need for taglines and allowing the lifts to be completed on schedule in wind conditions that would

have otherwise prevented operations.

THERE'S NEVER A NEED FOR YOUR TEAM TO BE NEAR A LOAD

The safety of the team is always the top priority for Multiplex. Multiplex identified the benefit of reducing risks by keeping personnel away from loads being lifted. Roborigger allows the dogman to orientate loads using a wireless remote during the lift so that the loads can be landed without needing to be in the landing zone.

A great example of this was seen during Multiplex's 388 George Street Project. Roborigger's ability to stabilise and control the load removed the need to use tag lines on 9-tonne rubble skips. When lifting and lowering loads down to the narrow loading zone, Roborigger prevented it from swinging over the public space so that only one traffic lane needed to be closed. Personnel only approached the loads to remove rigging once it was safely landed.

A NEW STANDARD FOR CONTRACTORS

"At Multiplex, we are always looking to find ways of making our sites and day-to-day operations safer", said John Flecker, Chief Executive Officer, Multiplex.

Multiplex are leading the way and setting a new industry standard.



NAME:

Matt Kingman

EMPLOYER:

Kingys Diesel Industries

**NUMBER OF YEARS IN
THE INDUSTRY:**

18

ROLE:

Director

MATT KINGMAN

KINGYS DIESEL INDUSTRIES

**COULD YOU GIVE US A SUMMARY
OF YOUR PROFESSIONAL JOURNEY
SO FAR? HOW DID YOU COME TO
BE IN YOUR CURRENT ROLE?**

I started my apprenticeship as a diesel fitter at Walter Wright cranes in Mackay when I was 15 years old. Growing up with my father in the industry, I wanted to see what cranes were all about.

After completing my apprenticeship I worked at various sites all over Australia and PNG, before starting my business on the Sunshine Coast.

Starting out with one ute and operating solo, I saw the need for Crane Techs on the Sunshine Coast and in South East Queensland.

Now, the business has an established mechanical workshop with a team experienced in crane maintenance.

**HAVE YOU WITNESSED THE CHANGES
IN CRANE TECHNOLOGY OVER
THE YEAR? WHAT HAPPENED,
AND WHAT DID YOU LEARN?**

From a maintenance perspective, there are plenty of technological changes in the crane industry at the moment.



I think a clear lift plan, including ground conditions, is imperative. From a maintenance point of view, don't be too intimidated to ask what a control does on the crane.

All load moment indicator systems are being updated to stop the risk of being bypassed. They are being 'foolproofed' so to speak. It makes operations a bit tricky, but from a maintenance point of view it's eliminating the 'test and try method' which is a good thing.

With the current shortage on new cranes and major inspection time slots, a lot of older machines that are out of date with Australian standards are being brought up to speed. We have been fitting hydraulic motion cut limiters to load moment systems on machines as old as 1984.

A technical side is also being brought into the crane borer electrical game.

We have completed a lot of upgrades on outrigger location, side slope, and all sorts of custom load moment safety systems.

WHAT IS THE MOST COMMON ACTION OR BEHAVIOUR YOU WITNESS IN THE FIELD WHEN OPERATORS DON'T PLAN FOR THESE CHANGES OR ADVANCES? HOW DO YOU THINK WE CAN FIX IT?

As a maintenance business, we only usually get involved when it has all gone wrong, or is about to.

I think a clear lift plan, including ground conditions, is imperative. From a maintenance point of view, don't be too intimidated to ask what a control does on the crane. It could be the difference between whether or not an incident occurs.

DO YOU HAVE ANY THOUGHTS OR IDEAS ON AN INNOVATION OR PROCESS THAT MAY HELP TO ADVANCE CRANE OPERATIONS?

More training around the safety systems on the machines. Operators need to understand that safety systems are on the machines to help eliminate or prevent an incident.

WHAT DO YOU FEEL IS THE MOST IMPORTANT SAFETY ISSUE AFFECTING YOUR PARTICULAR ROLE IN THE INDUSTRY TODAY?

The lack of training or communication from Work Safe regarding the major inspection process and annual inspection process.



NAME:

Jason Jordan

EMPLOYER:

Protective Pty Ltd

**NUMBER OF YEARS IN
THE INDUSTRY:**

10

ROLE:

Business Development
Manager

INNOVATION NAME:

GoUpSafely HV Proximity
Detector (GUS for short)

JASON JORDAN

GOUPSAFELY - HIGH VOLTAGE PROXIMITY SENSING FOR HEAVY MACHINERY

WHAT IS YOUR INNOVATION?

GoUpSafely - High voltage proximity
sensing for heavy machinery

**WHAT PROBLEM/ISSUES DOES
YOUR INNOVATION ADDRESS?**

Heavy machinery contacting high
voltage sources such as powerlines.

**WHAT MOTIVATED YOU TO
DEVELOP YOUR INNOVATION?**

Our Founder was an incident inspector who, after many years witnessing incidents involving fatalities and serious injury, saw a need to address the problem of powerline incidents.

WHAT WAS THE PROCESS IN DEVELOPING YOUR INNOVATION?

Once the problem was identified, understanding the engineering challenge was fairly simple. A product that was universal in application, easily installed and unfailingly dependable. A team of engineers was formed and the solution followed. Through tireless testing, continuous improvement and a desire to save lives, GoUpSafely was developed. The technology continues to evolve as we always believe in room for improvement.

DID YOU HIT ANY OBSTACLES/ ROADBLOCKS ALONG THE WAY? HOW WERE THESE OVERCOME?

Technical issues are common when designing innovative technology. Our team have many overlapping skills and, importantly, complementary skills, allowing for high-value collaboration amongst members. Obviously, world events have impacted our business in multiple ways. Our supply chain was hindered in early 2020, so now we source all parts in Australia and have still managed to maintain competitive pricing and have also reduced our reliance on internationally-sourced parts.

WHAT ARE THE BENEFITS OF YOUR INNOVATION? WHO SPECIFICALLY BENEFITS FROM IT?

GoUpSafely prevents heavy machinery from coming into contact with high-voltage power sources (i.e. powerlines).

We save operators from serious injury and companies from lost productivity, damage costs, and reputational damage.

WHO CAN ACCESS YOUR INNOVATION? IS THERE A COST ATTACHED TO ACCESSING IT?

Our technology is available to anyone looking to protect their investment in machinery and human resources.

DO YOU HAVE ANY CUSTOMER/ USER TESTIMONIALS?

“I have seen the GUS system in action on EWP’s working around powerlines in rural and urban settings, and on other plant and equipment on demonstration days. The practical application for this technology in the vegetation industry as an early warning system is beyond doubt – but there are so many areas where this could be invaluable. Protecting people, plant and equipment from accidental contact or breaching exclusion zones is a priority and this is another safeguard that can be easily fitted and up and running within 30mins. GUS goes a long way to preventing associated costs resulting from any incident involving electricity – to either peoples lives, business reputation and financial loss.”

- Daniel Heyburn, National HSE Manager

7 CRANE OPERATOR SKILLS YOU CAN PRACTICE ON A VR CRANE SIMULATOR

Article contributed by Iti

When people hear “Virtual Reality,” they usually think of VR Games like Beat Saber or Vader Immortal, and it’s not hard to understand why: over the last decade, VR grew from a quaint little start-up market to a ten-figure industry on the backs of these popular and immersive experiences. What was once thought of as a gimmicky peripheral has instead blossomed into an entire ecosystem in a few short years, with several major VR groups aiming to capture a market that’s projected to double to more than ten billion by 2024.

But amidst all the excitement about playing in virtual reality, it’s easy to forget that the same qualities that make VR Games enjoyable make VR Education engaging and retentive. When people are actively participating in a hands-on learning experience, they retain more information and are more likely to be able to apply that information in the field. As any seasoned operator can tell you, cranes are expensive. On top of the steep price tag that comes with ownership, they require space to practice, fuel and maintenance, and an instructor to supervise and train students. Where live crane operation is inaccessible, unfeasible, or simply in short supply and high demand, the ITI VR Crane Sim helps deliver realistic training and load handling exercises for crane operators no matter where they are, at a significantly lower price than live training. Follow along with a crane operator as they demonstrate just a handful of the skills that the VR Crane Sim can help sharpen:

1. NAVIGATING TIGHT SPACES WITH A LOAD

The VR Crane Sim offers a multitude of corridor scenarios that operate similarly to the NCCCO's Z-Corridor: A user is tasked with lifting a barrel off the ground while keeping an attached chain in contact with the path, navigating through the course, and setting the load down in a target circle, all within a time limit.

Corridors range from simple lines and arcs, to complex, twisting routes that require cautious handling of the test weight.

2. LEARNING THE OSHA STANDARD HAND SIGNALS

All crane operators are required to adhere to the OSHA standard hand signals while operating a crane. One way to teach users these signals is to have them navigate a load through a virtual maze with a fully voiced and animated signalperson. Administrators can toggle between hand signals, voice signals, or both, to train and test as desired.

3. PERFORMING BLIND LIFTS

Operators will not always have visual contact with the load. Sometimes, it must be lifted or placed outside of the operator's line of sight. The ITI VR Crane Sim offers several lift scenarios involving picking or placing loads while relying solely on the signalperson's



instructions, requiring great precision not to clip the sides of an opening or contact an unseen obstruction.

4. SETTling THE LOAD OUT OF A DEATH SPIRAL

One of the most important skills an operator can learn is catching a wildly swinging load, especially when the load is swinging in a circular motion, colloquially referred to as a "death spiral." Novice operators have an inclination to swing away from the moving load, inadvertently exacerbating the problem in the process. Here, the Sim teaches operators to swing in the direction of the load's movement as the load passes under the boom tip.

5. PERFORMING CRITICAL LIFTS

In certain cases, operators will need to perform lifts that require careful attention to one or more factors: heavy lifts, delicate or dangerous loads, or proximity to power lines can all introduce a need for careful and precise load handling, beyond even what is normally required. With the VR Crane Sim, operators can practice these sensitive tasks without fear of harming anyone or anything.

6. SETTING UP A CRANE FOR A LIFT

Though the Crane Sim focuses primarily on building operational skills, it's also important to know how to determine whether or not a crane can actually make a lift. Select scenarios

allow operators to fill out a crane's deduction checklist to ensure that, from pick to set-down, a crane has the capacity required to lift a load

7. HANDLING A CRANE DURING A MALFUNCTION

One learning opportunity the Crane Sim offers, that no other crane can replicate, is the ability to recreate a crisis in a safe and controlled environment. Mechanical failures, inclement weather, high winds and more can all be toggled by an administrator during a scenario to give operators the chance to learn how to react in an emergency with zero risk to equipment, personnel, or loads.

All this, and much more, can be found in the ITI VR Crane Sim, available for a fraction of the cost of live crane operation. If any of these skills sound like something you or your employees would be interested in learning, the next step is up to you! You can use the free ITI VR Crane Simulator Build and Price Tool to explore different options and build a simulator that is perfect for your team.



COME IN VR: REVOLUTIONISING PROFESSIONAL TRAINING

Article contributed by Sarah CHANIET with COME IN VR

WHO ARE WE?

Come In VR is a French company created in 2017 in Martigues, France.

Our ambition is to revolutionise professional training. We create and develop virtual reality training solutions to make learning fun and impactful.

We are working with you to imagine the innovative projects of tomorrow.

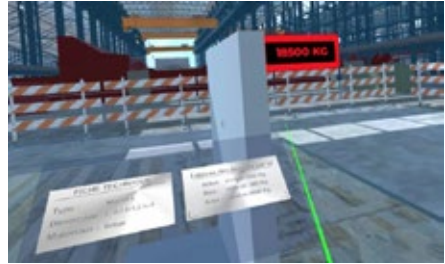


We recently announced the launch of our new virtual reality training solution for the practice of slinging.

This innovative solution is intended for training centres or companies wishing to train their apprentices or employees effectively. Thanks to this virtual reality immersion technology, Come In VR wants to create a strong experience, to make users aware of safety when handling and lifting loads, which today still has too many work accidents or even death due to improper handling and risk minimisation.

SLINGING – A DANGEROUS OCCUPATION

The sling trade is one of the most dangerous trades. In fact, 40% of lifting accidents are due to the load unhooking. 52% of accidents related to poor slinging result in hospitalisation, which can go as far as amputation, and 46% result in death. Professional training in the handling of slings is necessary to train in good practices, acquire the right reflexes, maneuver in compliance with safety rules, or even complete the prerequisites. The solution



developed by Come In VR makes it possible to complete the theoretical training by immersing the learner so that they are an actor in the experience.

LEARN BY PRACTICE

Experience allows you to learn how to assess the mass of a load, identify its centre of gravity and then choose the right lifting accessories according to its shape and weight. The adequacy of all the lifting accessories used in the sling connection must be carried out by checking their CMU (Maximum Useful Capacity) and their physical integrity. Once these steps have been validated, you have to hang and maneuver with the right method. In the VR world, learners can make mistakes without taking any risks or placing themselves or their team in danger. They can also complete the training as many times as they need to.

WHY TRAIN IN VIRTUAL REALITY?

Sling training with virtual reality technology has many advantages. It allows training centres or companies to use adequate and appropriate equipment without mobilising



Virtual reality gives the right to make mistakes, without risks or danger for the apprentice slinger and their colleagues on site.

production space and real machinery. It enables you to validate what you have learned before returning to a construction site. Virtual reality gives the right to make mistakes without risk-taking or danger for the apprentice slinger and their colleagues on site.

Businesses can get a real return on investment. First of all, by recreating environments and situations that are difficult to reproduce in real life and often costly in terms of equipment. The program is replicable and infinitely usable for large-scale training. Performance can be measurable and objectively comparable between learners.

Jean-François CHABAUD, Director of ECIR Formation – CFTP, adds: “Designed as an educational tool...the slinging training solution is understandable and usable by a wide audience ranging from operating personnel to site management. The use of this virtual reality module,

designed and developed by Come In VR, will allow us to stand out in our pedagogy by combining a virtual experience with the theoretical teaching provided by our trainers. Our learners will thus be even better trained by having fixed their attention and practised several slings during this experience which will enrich their experience”.



MOBILE CRANE SIMULATOR

Article contributed by CM Labs

Vortex Simulators from CM-Labs are simulation-based products on the market that accurately replicate machine instability, the ability to deploy outriggers to level the equipment before operation, and simulate the swing effect of the load while lifting objects.

Crane Industry Services reduces training costs and accelerates learning with Vortex Simulators. As its name suggests, Crane Industry Services LLC provides a wide variety of solutions to utilities, contractors, manufacturers, government and military, owner-operators, and others throughout the crane and heavy equipment industries. The company also offers training, qualifications, inspections, consulting and strategic planning for work and projects dependent on skilled trades.

Much of the success of CIS is attributed to – and will continue to rely on – its ability to provide customised, thorough, and practical training for equipment operation and safety. Instruction to operators at all levels (novice, experienced, and everything in between) is conducted through the company’s Georgia-based facility or on customer sites. From the classroom to the simulator to the field, students receive some of the most complete and thorough training available anywhere. Serving dozens of students each month, operator instruction remains key to the company’s growth strategy.

FASTER, MORE COST-EFFECTIVE TRAINING

Heavy equipment simulators offer numerous advantages on all fronts. They expose students to realistic real-world

situations (such as operating heavy equipment in tight urban settings) in a safe, virtual environment while providing training organisations with a platform for teaching complex or costly scenarios that cannot be easily replicated in the field.

“A swinging load can be extremely dangerous for any crane operator,” noted Inspector and Trainer, Noel Wheelchel.

“Simulators allow us to safely prepare students for such situations in a controlled environment.

What’s more, we can challenge them with a wide variety of tasks, distractions, and difficult conditions such as high winds, rain, and so on, without creating danger in or around the job site. But these





simulators aren't just for beginners. Their flexibility allows us to teach customised and advanced operations to even the most experienced operators. We can even practice complex, two-crane lifts with realistic configurations and set up."

"Simulators bring the classroom to life and provide a comfort level for students and trainers alike,"

explained the company's CEO, Debbie Dickinson. "They provide the inexperienced with a sense of 'OK, I've seen this before' familiarity when sitting behind the controls of the actual

equipment. And when you consider the expenses associated with hands-on equipment training in the yard, equipment rental, fuel, the hourly rate of a certified instructor, and maintenance – the cost of training can be astronomical. We recognised that simulation-based training offered advantages, but before investing, we wanted to quantify what, if anything, a student would learn on a simulator, faster, better, easier than sitting in the seat of a crane."

In 2014, CIS collaborated with CM Labs to help determine the impact of simulators on training. And the results were nothing short of eye-opening.

"Simulators bring the classroom to life and provide a comfort level for students and trainers alike."

“We learned that, depending on the operator’s skill level, one hour on the simulator was equivalent to up to four hours on a crane,”

Dickinson reported. “This accelerated training time and improved effectiveness immeasurably. The key rests in the ability to repeat an exercise as much as needed. Repetition builds confidence and muscle memory to instinctively determine and control load movements. And CM Labs’ Vortex simulators are the most effective at helping operators develop skills that transfer to real equipment, making them an efficient and objective method for training and qualifying operators.”

THE MOST THOROUGH & ENGAGING TRAINING

Following the assessment, CIS began incorporating CM Labs’ Vortex simulators into its training curriculum. The company employs simulators to teach new operators and allow experienced operators to upskill, prepare for re-certification, and practice complex lifts.

“You can only hold one’s interest with PowerPoint for so long,” explained Crane and Rigging Inspector and Trainer Noel Welchel. “Because they mirror the actual crane, the pedals, controls, joystick,

and levers all feel like actual hydraulic controls. Vortex simulators are as close to the real thing as you can get. We make them available to students during class, at breaks, and after class. Rarely do our simulators sit empty. It seems like someone is always at the controls.”

“We learned that, depending on the operator’s skill level, one hour on the simulator was equivalent to up to four hours on a crane.”

Together, we can build informed and inclusive workplaces that understand and openly address the subject of mental illness.



WE NEED TO TALK ABOUT MENTAL HEALTH IN THE CONSTRUCTION INDUSTRY

Article contributed by Chess Connect

The construction industry employs more than 625,000 people across Australia, making it one of the country's biggest employers, and the statistics surrounding suicide in this industry are quite confronting.



9% of construction workers have a condition affecting their mood, such as depression.

According to recent reports from MATES in Construction and PricewaterhouseCoopers (PwC):

- ▶ Construction workers are more than twice as likely to commit suicide as other people in Australia.
- ▶ Construction workers are six times more likely to die through suicide than in a workplace accident. Apprentices in construction are two and a half times more likely to commit suicide than other young men their age.
- ▶ 21% of workers in the construction industry were shown to have had a mental health condition,
- ▶ 9% of construction workers have a condition affecting their mood, such as depression.

An evidence review focusing on male-dominated industries commissioned by Beyond Blue also indicates that workers in the construction industry may have elevated prevalence rates of depression and anxiety.

With these facts in mind, it becomes increasingly important for employers to understand and support their team and consider that the people they

employ are likely to have experienced mental illness at some point.

Mental health illness costs Australian businesses

The recent PwC report estimated that Australian businesses were losing \$10.9 billion annually for neglecting to address mental health in the workplace.

However, businesses that take action will, on average, experience a return of \$2.30 for every \$1 invested in initiatives that foster better mental health in the workplace. The return is even higher in the construction industry – an average of \$2.50 for every \$1 invested.

Speaking openly reduces stigma and encourages people to seek help. We have identified six pillars of support that create a framework through which mental health issues in the workplace can be addressed.

THE 6 PILLARS OF SUPPORT

1. REDUCING STIGMA

Talking about mental health with someone who has lived through it is one of the best ways to address and reduce mental illness stigma. Organisations that specialise in mentally healthy workplace training will often be able to provide peer workers to work with staff. Peer workers are people who have lived with mental illness who can talk about their experience and describe evidence-based statistics that normalise the condition

2. INCREASING AWARENESS

Discussion on work health and safety, discrimination, privacy and self-care in relation to the person's role is crucial in fostering openness within the workplace.

Helping people feel comfortable talking about mental health should be a priority for an organisation.

Including this awareness in staff induction is a great way to start this process.

3. MAKING A COMMITMENT

Develop and share a collaborative Action Plan that aims to improve the mental wellbeing of staff. Include

progress points and a focus on the specific benefits for your employees, business and the community. This type of Action Plan should be part of a commitment that ensures everyone in an organisation is part of creating a mentally healthy workplace.

4. SUPPORTING EMPLOYEES

1 in 4 people has experienced depression or anxiety, which means that you likely work alongside people living with mental illnesses.

Employees with mental health conditions must have the support they need to stay at or return to work. Employers can do this by accessing Workplace Rehabilitation services through an accredited provider in their local area.

5. BUILDING SKILLS AND CONFIDENCE

Provide tools and resources for workers to check in with themselves and manage their own wellbeing.

Employees and managers should also have the confidence to approach someone they may be concerned about and have access to the right training and resources to manage these conversations. Resources are available at: <https://www.ruok.org.au>

6. EDUCATION ON WORKPLACE BULLYING

Organisations need to provide examples of workplace bullying and evidence-based statistics on consequences. Senior employees should be educated on how to mentor more vulnerable workers such as apprentices or new staff.

7. THE CASE FOR HAVING A MENTALLY HEALTHY WORKPLACE

Businesses that actively promote good mental health attract and retain top talent and are great places to work. By supporting people with mental health conditions and encouraging openness, employers create diverse and all-encompassing workplaces.

Together, we can build informed and inclusive workplaces that understand and openly address the subject of mental illness.

CHESS Connect has over 20 years of experience in providing mental health and wellbeing support to foster healthy, productive workplaces. Through our support framework, we work collaboratively with the employer and workers to understand your workplace and identify simple, concrete actions to promote a mentally healthy workplace.

We have a number of workplace centric wellbeing services, including

- ▶ Business Resilience Project
- ▶ Mentally Healthy Workplace Workshops
- ▶ Trauma-Informed Customer Service Training Workforce Regeneration and Redeployment

Did you know? If you operate a business in a bushfire affected region on the Mid North Coast or Northern Rivers of NSW, you could be eligible for free trauma-informed workplace workshops through our Business Resilience Project. Contact us to determine eligibility for your business.





LIFTING MATTERS

Content deadline
for next issue:

AUGUST 2022

Next issue available:

SEPTEMBER/OCTOBER 2022

Any questions?
Want to get involved?

Contact us at
editor@liftingmatters.com

Disclaimer – This newsletter is not an exhaustive list of all safety matters that need to be considered. Whilst care is taken in the preparation of this material, Lifting Matters does not guarantee the accuracy and completeness of this information and how it applies to your situation. Lifting Matters will not be responsible for any loss, damage or costs incurred as a result of errors or omissions in relation to the material in our publication, or for any possible actions ensuing from information contained in our publication.

Any views or opinions represented in this publication are personal and belong solely to the author and do not represent those of people, institutions or organisations that the publisher may or may not be associated with in a professional or personal capacity unless explicitly stated.

LIFTINGMATTERS.COM.AU