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safety solutions

health & safety at work

THE RISE OF THE CORDLESS MACHINES

SAFETY BENEFITS OF A NEW GENERATION OF TOOLS

MINING CASE STUDIES
APPS, LIGHTS, SENSORS & RETROFITS

LOOK UP AND LIVE
MACHINERY AROUND POWERLINES

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FROM THE EDITOR

In the August 2021 edition of ***Safety Solutions***, key feature concerns are machinery, mining, electrical and hazardous areas/goods. Tony Cooper leads us in with 'The rise of the cordless machines', explaining via example how companies in industries with high safety priorities — such as mining and energy, construction and infrastructure — are embracing a whole new generation of powerful, portable and ergonomic tools; these lighten the load while they increase the safety and efficiency of operations such as bolting and unbolting, cutting, bending, lifting and forming.

Marnie Williams raises machinery-around-powerlines awareness, following four serious incidents in regional Victoria over three weeks in April and May of this year. Concrete advice comes alongside a plea for machinery operators to take more care and to always look up and live. Respirable crystalline silica, a hazard of especial topic concern, is explored with respect to the critically important function of protective coveralls that minimise dust particulate penetration through to the garments being worn underneath.

Then there's our mining focus: a multifaceted venture inclusive of apps, strip lights, 'super' sensors and vehicle retrofits case studies, as well as a feature from Carinne Pater with selection suggestions for ensuring appropriate lighting in environments such as underground mines, where fire or explosion hazards exist due to flammable gases or explosive substances. Attentive readers will find connection across the themes of this issue's features, and our usual news, case study and product breadth coverage; connections and collaboration are vital in the ongoing search for and adoption of safer work solutions.

Stay safe, and I hope you enjoy the read.

Dr Joseph Brennan
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IN THE NEWS

SWA RELEASES THEME, CAMPAIGN KIT FOR NATIONAL SAFE WORK MONTH

Ahead of the launch of National Safe Work Month on 1 October, Safe Work Australia has released the theme and campaign kit, to encourage everyone to take responsibility for health and safety in the workplace. The theme for 2021 is think safe. work safe. be safe., to ensure a healthy and safe workplace. The campaign will run through October. The campaign kit had a range of digital resources, including a digital brand kit, hero image, website header, social media tiles (for Facebook, LinkedIn and Twitter), email signature, web badge and posters.

To participate in National Safe Work Month 2021, go to the National Safe Work Month webpage and download a range of resources from the campaign kit. Customise and share the resources with your workplace, work teams, supervisor and/or health and safety representative. Follow Safe Work Australia on social media to keep up to date on new campaign materials and to share National Safe Work Month updates. Use the hashtags #safeworkmonth and #ThinkWorkBeSafe when promoting National Safe Work Month on social media.

COMPANY DIRECTOR SENTENCED TO RECORD PRISON TERM IN WA

Western Australia has recorded its first imprisonment under new workplace health and safety laws. Mark Thomas Withers, the director of a shed building company, is the first person to be sentenced to a term of imprisonment under the new laws.

The term of imprisonment of two years and two months is the longest term of imprisonment ever imposed for a work safety and health offence in Australia, and the eight-month immediate-term of imprisonment is also the longest ever immediate term imposed for a work safety and health offence in Australia.

MT Sheds and Withers pleaded guilty to seven separate charges, including charges in relation to the death of Jake Williams and serious injuries to Fraser Pinchin in 2020. The charges included one of gross negligence against MT Sheds, for which the company was fined $550,000.

The fines are the highest under the Occupational Safety and Health Act, following the state government's increase in penalties for breaches of the workplace safety laws in 2018.

VICTORIA TOUGHENS DANGEROUS GOODS REGULATIONS

From 1 July 2021, duty holders storing or handling hazardous material above certain quantities have to follow strict new reporting requirements, due to amendments to the Dangerous Goods (Storage and Handling) Regulations 2012. The new regulations require all duty holders occupying premises with prescribed quantities of dangerous goods to notify WorkSafe Victoria at least every two years. Previously, notification was required every five years.

Significant changes, as prescribed in the Regulations, to a site where dangerous goods are stored and handled require an additional notification within three business days of the change occurring. Prescribed changes include a significant change in the quantity or type of dangerous goods, changed ownership or control of the dangerous goods, and other changes that significantly alter the risk profile of the site.

The amendments ensure that information reported to WorkSafe Victoria about dangerous goods storage is never more than two years old and provide more relevant information to WorkSafe Victoria to inform a risk-based approach to the regulatory oversight of premises where dangerous goods are stored in significant quantities.

Existing duty holders have six months from 1 July to submit a notification to WorkSafe Victoria that complies with the amended regulations, unless a prescribed change occurs within that period, in which case duty holders must notify WorkSafe within three business days.

WorkSafe Victoria has developed an online notification form to help duty holders and replace the previously used digital and paper forms. Duty holders seeking more information about their new responsibilities can call WorkSafe Victoria's Advisory Service on 1800 136 089 from 8.30 am to 6.30 pm, or visit the WorkSafe Victoria website.

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IN THE NEWS

ACT ENACTS TOUGHER LAWS TO BOOST WORKER SAFETY

Canberra workers will be better protected and negligent employers will face harsher penalties under law changes made by the ACT Government. The ACT Legislative Assembly will be amended to make industrial manslaughter an offence under ACT work health and safety laws, with Industrial Relations and Workplace Safety Minister Mick Gentleman stating that stronger industrial manslaughter legislation will help prevent workplace tragedies and remind employers of their obligations.

"This change will also give families of those killed in the workplace better access to justice and provide more avenues to address poor workplace safety practices and systemic non-compliance," said Minister Gentleman.

The new offence will carry an imprisonment penalty of up to 20 years for individuals and $16,500,000 for corporations who cause the death of a worker through continued disregard of safe work practices and breaches of work safety obligations. Industrial manslaughter offence provisions will be transferred from the *Crimes Act 1990* into the *Work Health and Safety Act 2011*.

"We are delivering on the government's commitment to strengthen workplace safety across the ACT and standing up for the rights of workers," said Minister Gentleman.


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ANGLO AMERICAN INVESTS IN MINE SAFETY AFTER GROSVENOR REPORT

Anglo American has committed $5 million to fund underground mining research, in partnership with industry research and technology partners, to improve industry knowledge in certain areas. The investment followed the May 2021 release of Part Two of the Queensland Coal Mining Board of Inquiry's report into an incident that occurred in Grosvenor Mine in May 2020.

Tyler Mitchelson, CEO of Anglo American, said the company has already taken steps to enact the recommendations in Part One of the Board of Inquiry's report, referencing the $60 million investment in safety initiatives over the last year.

The Inquiry examined the nature and cause of the serious incident at Grosvenor Mine, near Moranbah, as well as 40 high-potential exceedances involving methane exceedances between 1 July 2019 and 5 May 2020. The Board of Inquiry made recommendations to improve the safety and health practices and reduce the risk of similar accidents occurring in the future.

Mitchelson noted that over the past 12 months, Anglo American has implemented a range of measures to address issues that have come to light through investigations and evidence before the Board of Inquiry; these measures include technology pilots, additional gas drainage infrastructure, expert reviews, and further improvements to a range of processes and controls.

Anglo American commenced the implementation of the Board of Inquiry's recommendations by removing workers from higher risk areas and enhancing its underground mining controls. Anglo American has also invested in data and storage capabilities as well as improvements to gas management measures, and enhanced practices and processes to eliminate spontaneous combustion events.

WORKPLACE HEALTH & SAFETY SHOW POSTPONED TO 2022

Due to the ongoing uncertainty of border closures and lockdowns by various state governments, the International Exhibition & Conference Group Pty Ltd has rescheduled the Workplace Health & Safety Show Sydney until 20 and 21 September 2022.

"After speaking with our exhibitors, who share our disappointment, we are buoyed by their excitement and eagerness to take part in the rescheduled event in Sydney 2022. We are now in the fortunate position of being able to offer our partners, sponsors, visitors and entire safety community the choice of two events in 2022," said Marie Kinsella, Chief Executive Officer, IEC Group Aust Pty Ltd.

The Workplace Health & Safety Shows will be held in the Melbourne Convention & Exhibition Centre on 25 and 26 May 2022 and in the Sydney Showground on 20 and 21 September 2022.

The Workplace Health & Safety Show is a leading workplace health and safety event spanning across two days. Destined to be more than just an exhibition, the Workplace Health & Safety Show promises a live, interactive two-way learning experience with a trade show featuring over 100 brands, thought-provoking talks and interactive forums, led by industry leaders who will shed light on a range of issues from workplace mental health to game-changing new technologies.


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The Workplace Health & Safety Show is a must-attend event for all safety professionals from a range of industries, including manufacturing, building/construction, mining, councils/local government, hospitals, transport and more.

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AS/NZS 4602.1:2011

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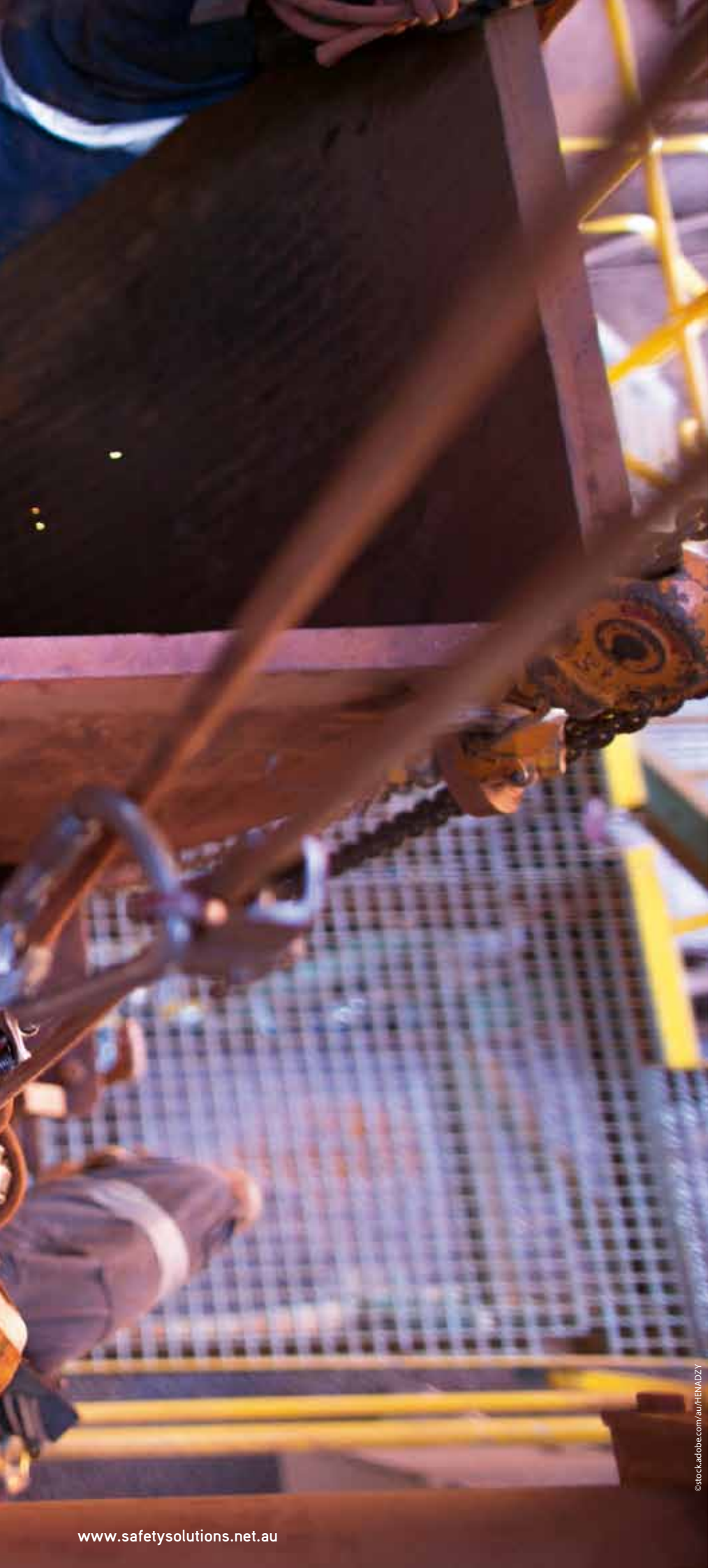
THE RISE OF THE CORDLESS MACHINES

SAFETY BENEFITS OF A NEW GENERATION OF TOOLS

Tony Cooper, Product Engineer & Asia-Pacific Marketing Manager, Enerpac



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Conscious of their duty of care (and the awful cost of injuries and shutdowns), companies in industries with high safety priorities — such as mining and energy, construction and infrastructure — are embracing a whole new generation of powerful, portable and ergonomic tools that lighten the load while they increase the safety and efficiency of operations such as bolting and unbolting, cutting, bending, lifting and forming.

The huge surge in new infrastructure development in Australasia — coupled with a rising wave of decommissionings and conversions of obsolete fossil fuel plant — will present an array of safety challenges and opportunities for industry in the years ahead. Old manual methods of infrastructure construction and renewal will be replaced by new ways of exerting maximum force with minimal risk to workers, as we gratefully leave the age of flogging spanners and wasteful and unnecessary practices.

Hydraulic battery technology

Hydraulic battery technology has reached a point where cordless alternatives (such as hydraulic pumps) can now offer the same performance as their corded counterparts, with a sufficient fuel reservoir to last whole shifts without needing to replace or recharge the battery. An additional bonus is that they can be used in locations where there's limited or no access to power, such as remote sites, inaccessible machinery or high places where dragging a cord around is not an option. Not to mention obviating the risk of electrocution.

In saying this, I should emphasise that for a myriad of applications, a corded tool is totally safe, and the ideal solution where the cords and power input are completely out of anyone's way. And it should be emphasised too that both corded and cordless hydraulic tools available now are pursuing a path towards lighter weight and far better

Case study: mining equipment company lifts the lid on common conveyor belt problem

Mining equipment company Techmine Solutions developed a solution to a common mining problem — efficiently lifting thousands of metres of conveyor belts for maintenance. Techmine developed a lightweight hydraulic belt lifter that utilises Enerpac's XC-Series Cordless Portable Hydraulic Pump to safely and reliably provide the hydraulic pressure (700 bar, 10,000 PSI) required to lift belt sections up to 2000 kg.

"The new belt lifter effortlessly raises the belt in 20 to 25 seconds without requiring complex input from the user," said Justen Wright, Principal Engineer, Techmine, and inventor of the technology. "An 1800 mm belt lifter, comprised of three main parts, weighs only 29.5 kg once assembled. The main 13.7 kg lifting beam is ergonomic and easily portable."

ergonomics and safety than ever before. This is particularly the case where the hydraulic technology is high-pressure (700 bar, 10,000 psi), which concentrates the greatest amount of force into the most compact and therefore easily handled tools. And for all clean, green electric tools — corded and cordless — increased safety is critical because of the huge personal and national costs of workplace accidents.

The toll on workers and businesses

A worker is killed at work nearly every second day in Australia, and as tragic as these deaths are, these figures represent just the tip of an accident iceberg. According to Safe Work Australia (SWA), work-related injuries cost the Australian economy around $60 billion every year, representing almost 5% of the nation's GDP. Workplace injuries impose a terrific physical and mental toll on victims and their families. Injuries also prove to be a massive drain on businesses' costs and productivity, with stoppages and remediation always involving downtime and punishing the uptime and efficiencies industries are seeking in these competitive times.

The industries on which I will focus this article — agriculture, transport, mining, construction, energy, manufacturing — make up the top six hazardous categories (which, in fairness, reflects the fact that these are also huge industries and big employers that have made many and continuing strides to minimise accidents).

Common injuries and tools that can help

The most common injuries across all industries, according to SWA, include sprains and strains of joints and muscles, which comprise 41.8% of all incidents. These are most often caused by poor manual handling practices and improper work health and safety handling, which can lead to the ubiquitous slip and trip accidents, among others. Workers who are required to bend and move their bodies to lift, carry or push heavy items are at serious risk of straining their muscles.

Following are some of the most common hazardous situations we seek solutions for by involving ergonomic, portable and cordless tools, or new technologies that replace manual inputs with time-saving and safer alternatives:

1. Slip and fall accidents, which are still too common to all sectors.
2. Repetitive strain injuries, in all industries, particularly where old equipment is manual and bulky.
3. Maintenance in confined spaces — especially mining energy and construction, but also inside heavy machinery (mobile and static).
4. Heavy lifting.
5. Emergency repairs in the field, to prevent downtime.
6. Rescue work, where powerful tools are needed immediately.
7. Airborne and remote sites work, where tools must be light and self-sufficient.
8. Sites where there is heavy wheeled traffic, such as forklifts in a factory or vehicles in a distribution centre.
9. Working at heights, particularly construction, but in plenty of other situations also, including mining loader booms, cranes and conveyors.

Of course, having the appropriate safety training to ensure standards compliance, and the safety of everyone involved is vital, whatever solution is adopted.

Areas where cordless tools are making serious safety inroads

Bolting at height

Carrying out bolting operations at height runs the risks of slip and fall accidents and the danger of dropped objects to those working beneath. Falls from height or being hit with moving or falling objects are among the major causes of death, and the cause of thousands of serious injuries to workers on construction and infrastructure projects. Such hazards will also become a greater challenge in the energy industry as wind towers become more and more prevalent.

Lightweight ergonomic cordless tools — properly secured, with proper training — help provide a solution by which workers can safely exert precise force on repetitive tasks such as bolting. Such lightweight tools will also provide a solution to fatigue when working in confined spaces, where there is limited room to manoeuvre around the workpiece and where manual labour can be hot and rapidly fatiguing.

Another area where cordless tools are making safety inroads is in the servicing of cranes and conveyors, without which industry ultimately cannot function.

Heavy lifting

Heavy lifting always presents challenges, both during the process — and sometimes further down the line, when unbalanced lifting can permanently compromise the long-term safety and stability of the structure being created. This is another area where technology is overtaking old methods, whether the lift involves, say, a single turbine or transformer, or an entire oil production platform, which must be precisely assembled, lifted, shifted and loaded so it can withstand the long-term effects of exposure to the elements at sea.

For example, high-efficiency, high-safety synchronous lifting technology,

> OLD MANUAL METHODS OF INFRASTRUCTURE CONSTRUCTION AND RENEWAL WILL BE REPLACED BY NEW WAYS OF EXERTING MAXIMUM FORCE WITH MINIMAL RISK TO WORKERS, AS WE GRATEFULLY LEAVE THE AGE OF FLOGGING SPANNERS AND WASTEFUL AND UNNECESSARY PRACTICES.

where required, can allow multiple cylinders to be used simultaneously to lift structures within an average accuracy between the cylinders of a millimetre or less. This technology can also weigh and balance the load, during lifting and shifting, to ensure safety and longevity of the structure.

One of the biggest jobs using this technology in recent years was where Malaysia Marine and Heavy Engineering used 352 compact, high-pressure 300-tonne cylinders to lift and skid the 43,000-tonne Gumusut-Kakap floating oil production system onto a vessel waiting in the Straits of Johor. While the technology employed is capable of lifting and shifting far greater weights than the Gumusut-Kakap (it can lift more than the equivalent of the 52,000-tonne weight of the steel in the Sydney Harbour Bridge, for example, or reposition a tunnel boring machine) it was the system's ability to sense and control any deflection of the pontoons and main superstructure that won it plaudits for protecting structural integrity throughout the lift-weigh-shift-and-launch process.

The same synchronous lifting technology enabled contractor partners SKF and Sandvik to achieve precision, safety and avoidance of downtime during a 220-ton lift to facilitate slew bearing replacement on a GrainCorp ship loader at the Gladstone Port Terminal in Queensland. The EVO synchronous lifting system — using PLC control to manage four heavy-duty CLRG cylinders simultaneously — was used to lift the upper structure of the ship loader more than 300 mm, allowing the old bearing to be taken out and a new one put in.

When taking the slew bearing out of the Port of Gladstone loader, the upper

The 43,000-tonne Gumusut-Kakap floating oil production system loads onto a vessel.

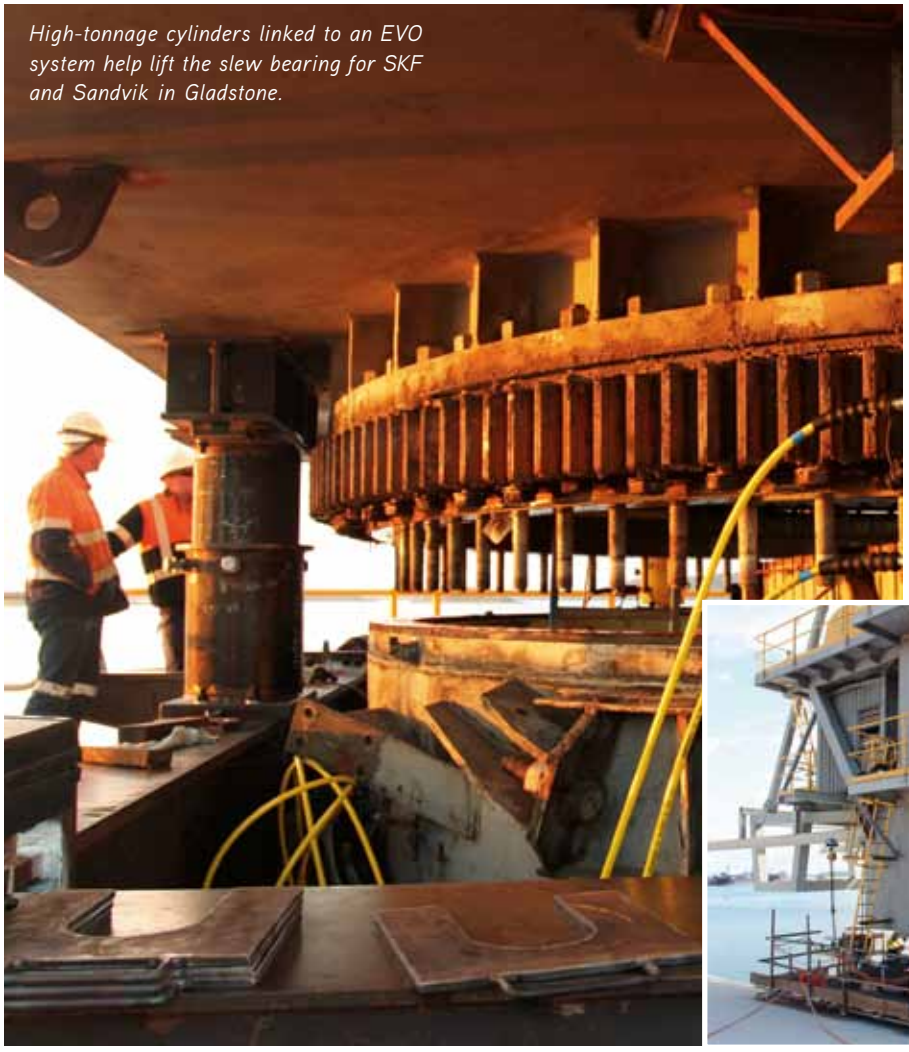
Case study: Queensland contracting company eases handling by saying farewell to flogging hammers

My final example of practical, shop floor enterprise and innovation (which is often where good safety practice comes into effect) comes from a Queensland contracting company. Gibson Instrumentation Services (GIS) developed a safer, faster and more cost-efficient way to assemble heavy ABON coal feeder chain links by replacing strenuous manual labour with compact and powerful hydraulic power.

The 700 bar high-pressure hydraulic equipment — supplied by Cooper Fluid Systems in Mackay — is used to assemble the chain links to form ABON conveyors of a type produced by FLSmidth for extensive use in the mining and energy, coal, cement and aggregate industries.

GIS eliminated the need to use flogging tools during on-site assembly by introducing into their workshop a neatly portable combination comprising Enerpac's C-clamp, 10-ton cylinder and lightweight PU series Electric Economy Pump with pendant control and pressure gauge for safety.

The new combination is used in ABON OEM work in the workshop to precisely assemble chain lengths often weighing more than a ton, typically achieving tasks in one day that previously might have taken several. The combination weighs less than half the 37 kg of the previous customised tool that took two people to lift safely and required a crane for positioning. The new tool is also light enough to be taken on-site for maintenance tasks, where it also increases the safety of the job and cuts the time taken to do it.



High-tonnage cylinders linked to an EVO system help lift the slew bearing for SKF and Sandvik in Gladstone.

structure needed to be lifted straight up with absolute precision. The EVO system managed to stay within an average accuracy between the cylinders of 0.54 mm, which is incredibly accurate for a lift like this. Using the EVO synchronous lifting system allows companies like SKF and Sandvik to lift all sides of the bearing evenly and precisely from a central control point. By digitally monitoring and controlling lifting operations, they can enhance safety and precision compared with manual lifting operations.

The time for cordless machines is now

Recent worldwide events have forced a rethink of the old ways of doing things. During the coronavirus (COVID-19) pandemic, for example, we have all been forced to look at new ways of performing old tasks. Because we couldn't have too many people together, there has been a spurt in the relevance of digital technologies (such as the EVO synchronous lifting technology). Technologies that enable us to do a better job, while removed from danger, are getting a real boost. At the same time, the automotive transformation from fossil fuels to electric power has taken giant strides.

Over the last decade a surge in lithium-ion battery production has led to an 85% decline in prices, making electric vehicles and energy storage commercially viable for the first time in history. Battery-based safety tools have benefited immensely. Once not regarded as a serious heavy-duty tool, they are now coming into their own as a mainstream safety product, benefiting both the environment generally and their users particularly. Sometimes, it seems, it takes a major problem to produce a major advance. Let's make this the case for safety in the workplace, which is a concern we all share.

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AUSTRALIAN MADE

CASE STUDY

Advanced defibrillators win five-star safety award

Earlier this year, ZOLL Medical Corporation, a company that manufactures medical devices and related software solutions, was recognised by the World of Safety & Health Asia (WSHAsia) in its inaugural New & Innovative Solutions Awards program. ZOLL was recognised for its ZOLL AED 3 and ZOLL AED 3 BLS automated external defibrillators (AEDs); as the only products to receive a five-star rating, the defibrillators were recognised for their smart technology and short interval between compressions and shock delivery.

Elijah A White, President of ZOLL Resuscitation, said the company is committed to delivering live-saving AEDs that enable bystanders and rescuers to act quickly and with confidence in medical emergencies. "We're honoured to be recognised by World of Safety & Health Asia for our Real CPR Help and RapidShock technologies. Research shows that real-time CPR feedback, along with training, more than doubles cardiac arrest survival rates, and we're dedicated to doing our part to deliver advanced CPR feedback technology, ease of use and reliability to support both professional and lay rescuers through each step of the process," said White.

The New & Innovative Solution Awards recognise excellence in products and services that aim to improve workplace safety and health. A panel of five renowned figures in the safety and health industry from across the Asia–Pacific region evaluated the entries, with a five-star rating indicating approval from each of the five judges. The ZOLL AED 3 and AED 3 BLS defibrillators both include ZOLL's RapidShock Analysis technology, with short pauses for analysis and fast time to shock. It can analyse a patient's heart rhythm in three seconds, followed by delivery of the shock in as little as five seconds.

The intuitive design and enhanced features of the ZOLL AED 3 defibrillator give users the confidence and knowledge needed to treat sudden cardiac arrest (SCA). Real CPR Help technology helps rescuers deliver high-quality CPR with real-time, guideline-driven feedback on the quality of chest compressions. The ZOLL AED 3 also features full-colour display with vivid rescue images, a CPR cycle timer and a large colour bar gauge that shows CPR compression depth. The universal design of the CPR Uni-padz electrodes on the ZOLL AED 3 allows rescuers to treat adult and paediatric victims of SCA with the same set of pads by activating the child mode. Wi-Fi connectivity enables automatic reporting of device status, enabling organisations and rescuers to know the AED is ready for use. It also provides the ability to access and transmit cardiac arrest event data to medical professionals.

The ZOLL AED 3 BLS defibrillator includes all the features of the ZOLL AED 3 defibrillator, but also provides in-depth rescue support for professional rescuers. A CPR dashboard on the device shows elapsed time, CPR cycle countdown, shocks delivered and ECD. RescueNet CaseReview enables rescue performance data to be exported via USB or transferred directly over Wi-Fi. Data can be evaluated and used to improve future responder performance. The ZOLL AED 3 BLS guides rescuers in delivering high-quality CPR and is designed to be one of the fastest AEDs in the industry at delivering a shock after chest compressions stop — two critical components to increasing a victim's chance of survival.

Raymond Watt, founder of World of Safety & Health Asia, said the ZOLL AED 3 and ZOLL AED 3 BLS were designed with smart technologies that support all rescuers and automated monitoring features with Wi-Fi connectivity to enhance emergency readiness. "We are impressed by the innovative AEDs from ZOLL Medical, with their remarkably short pre-shock pauses between compression cycles: the shortest in the industry," said Watt

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Lone worker safety app

WorkSafe Guardian is a lone worker safety system that provides an on-demand monitored alert response to employees, relieving management of their responsibility to be available 24/7. It can be utilised in all industries for field staff, isolated workers, in-home services or working from home.

WorkSafe Guardian allows employees to activate either a medical alert or a safety alert; these alerts are responded to with the appropriate emergency personnel and can be activated in four different ways. All alerts are actioned by licensed and trained professionals at the WSG Response Centre. The Response Centre is approved by all relevant emergency services around Australia and is accredited ASIAL 'Grade A1' — the highest possible rating under the Australian Standards.

A secure online portal enables management to issue staff the WSG App to utilise welfare check-ins, safety and medical alerts with location tracking only when assistance is required. WSG supports organisations to reduce risk and perform their duty of care to employees working alone. Managing the WorkSafe Guardian app is made easy with a user-friendly interface and easy onboarding. Whether users need to add new employees, set escalation groups for response plans or generate user reports, WSG is designed for people with any technology background and is included for unlimited users with no additional charges.

WorkSafe Guardian

www.worksafeguardian.com.au

Health and safety management software

Safety Champion software is a smart health and safety management software that supports hundreds of Australian businesses across various industries to boost their safety performance. It is developed by UI/UX focused software designers and developers and OHS/WHS consultants to deliver sustainable and effective safety programs over time.

With a clean and simple interface, powerful reporting, intuitive dashboard, user-friendly iOS/Android Apps and preloaded templates, Safety Champion software enables businesses to meet their legislative and compliance duties. The software includes 13 essential modules for effective safety management, including incident reporting, planning and compliance, inspections and audit, hazard and corrective action, communication and induction, site attendance, reporting, document, insurance, chemical, training, contractor and human resource.

Safety Champion's experienced OHS/WHS professionals guide businesses throughout the implementation process, tailoring their approach to help software work for unique business needs.

Safety Champion Software Pty Ltd

www.safetychampion.com.au

Machinery safety platform

Plant Assessor is a cloud-based machinery compliance and risk assessment software that is dedicated to ensuring machinery is safe for use and meets all legal compliance requirements. Plant Assessor captures and facilitates the sharing of machinery information between principal contractors, subcontractors, hire companies and more. Containing details of over 110,000 makes and models of equipment, Plant Assessor is a large machinery safety platform with a safety solution to meet the needs of anyone who owns, operates, manages or supplies plant.

With Plant Assessor, users can perform the following tasks easily and efficiently: machinery risk assessments, digital pre-start safety checks, set up machine service and scheduling alerts, access machine-specific safety and risk assessment information in real time, and outsource risk assessments to Plant Assessor's Professional Services team.

Plant Assessor can reduce safety management costs, increase safety management effectiveness and productivity, and help users feel confident in their machinery safety systems and processes. Users can stay up to date with the latest industry developments and legislations, and gain access to machinery compliance safety experts.

Plant Assessor

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MINING CASE STUDIES
APPS, LIGHTS, SENSORS & RETROFITS

In this mining case studies feature we take a look at four solutions that are using technology to improve safety in Aussie mines: an industry app intended to support mental health and resilience; strip lights specially designed for environments such as underground mines, where fire or explosion hazards exist due to flammable gases or explosive substances; the work of a mechanical engineer, who has designed sensors that can detect early mechanical issues in oil and gas pipelines, making working conditions safer for miners; and an electric vehicle retrofit geared towards driving down the dangers of diesel particulate matter in our underground mines.

CASE STUDY

New app prioritises mental wellbeing, safety of miners

Mental health is central to health and safety, as mental health problems can have an adverse impact on mining workers, their families and industry productivity. Australia's minerals industry has taken steps to support the mental health and resilience of its workforce with the launch of the free MineWell mobile app, developed by miners for miners, to reduce stress and improve wellbeing. The launch of the MineWell app is a step forward in making help available to mining workers and their families who may be going through a tough time because of long hours, separation, isolation or financial stress. Many fly-in fly-out (FIFO) workers have also been affected by the COVID-19 pandemic, which has resulted in longer shifts and more time away from family and friends.


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The Minerals Council of Australia (MCA) and its partners have worked over many years to build industry understanding and capacity through the Blueprint for Mental Health and Wellbeing industry guide. Australia's mining industry is delivering a range of programs that promote mental health and wellbeing, prevent problems, and provide an effective and early response as part of an integrated approach within overall health and safety policy and practice. This includes MineWell, a preventative mental health and wellbeing app developed by the MCA and Utility Creative to provide prevention, intervention and education in mental health and wellbeing for Australian mining workers and their families.

The app includes a range of features, including personalised scheduling for shift workers to promote better sleep and alertness whilst on shift. The app also provides advice and exercises for improving sleep quality, staying active and positive, and staying well during the COVID-19 pandemic. The app features tools that help users take control through breathing, taking a reality check, managing emotions and releasing tension. A social connection tool also helps users schedule anniversaries, birthdays, catch-ups and other important events.

The app includes a crisis response tool for direct calls to MATES in Mining, Lifeline, Beyond Blue and other help services. A Budget Well feature helps users set a target budget and savings goals, while helping to track progress to reduce anxiety relating to financial management. MineWell was developed based on feedback from focus groups and user testing by Australian miners and is available free to all mine workers and their families through the Apple App Store and Google Play. All personal information provided by app users remains private, is only stored on the user's device and cannot be accessed or gathered by others.

Minerals Council of Australia
www.minerals.org.au

CASE STUDY

Explosive-proof LED strip lights the way in hazardous areas

Hazardous area LED strip light specialist and trading partner of x-Glo Lighting, Mineglow, has launched IECEx certified explosive-proof LED strip lights in Oceania. The x-Glo IECEx range is designed to reduce the risk of explosions in gas and oil rigs, coalmines and other industrial applications, being purpose-built for environments where fire or explosion hazards exist due to flammable gases or explosive substances such as vapours, mists or dusts. The LED strip light solution provides protection by encapsulating electrical ignitions inside the light. Mineglow General Manager Carinne Pater said the IECEx certified lighting improves health and safety by protecting workers from the risk of accidental ignitions of flammable or explosive materials. Pater noted that the best way to prevent explosions in high-risk industrial areas is to remove potential ignition sources, adding that lights are some of the most common causes of explosion ignition.

"Our solution minimises risk by isolating and containing sparks within the strip to prevent explosions from escaping and potentially igniting the gases and particles in the atmosphere. The low profile of our lighting solution also means that they can't be knocked and shatter. This greatly minimises the risk of an explosive reaction from spreading or igniting volatile substances in the area, so in terms of health and safety — the benefits are significant," Pater said. An underground coalmine in Australia, offshore floating production storage and loading unit in Western Australia and a paint manufacturing plant in New South Wales have all adopted Mineglow's x-Glo explosive-proof LED strip lights. In doing so, they have increased their operational efficiency and workplace safety, while reducing maintenance and operating costs.

The x-Glo LED solution is IECEx, ATEX and RoHS approved and certified for gas zones one and two, and dust zones 21 and 22. The lights are encapsulated with silicone, making them resistant to dust, humidity, chemicals and extreme environmental temperatures without enabling the risk of explosion. The LED-strip design also offers benefits over conventional lighting, due to its flexibility, efficiency, durability and ease of deployment.

"This range is unique as it combines IECEx certified protection and peace of mind with all the benefits of premium, industrial-grade LED strip lighting. Beyond energy efficiency alone, industrial-grade LED strip lighting is renowned for its flexibility to install quickly and easily in hard-to-reach places, is fully customisable in length and requires zero maintenance," Pater said. Due to their flexibility, the lights are easy to install and can be mounted to any surface, including curved surfaces and corners, to provide consistent lighting to illuminate large areas. A single strip of lighting runs up to 30 metres and can be powered with 24, 36 or 48 V (AC or DC), giving customers the option to choose the level of illumination for their application.

Mineglow's range has a 50,000-hour lifespan and can provide a daylight spectrum light in white 6500K for continuous lighting in hazardous areas and red, amber and green for emergency directional lighting for illuminating escape routes. Pater said LED explosion-proof lighting solutions are becoming a safer, more cost-efficient solution to alternative complex lighting infrastructures, particularly in the Asia–Pacific region.

"With the increasing regulations on worker safety globally, we're seeing a lot of growth in the explosive-proof lighting market. It's fantastic that we can provide a flexible LED strip lighting solution that's truly unique and purpose-built for harsh conditions," Pater said. Pater added that the replacement of incandescent and compact fluorescent lamps continues to grow with the improvement of diode technology that aids higher power LEDs with higher lumen output. "Using high-quality SMD LED chips, our explosive-proof range offers high brightness, colour consistency, uniformity and most importantly, high reliability," Pater said.

Mineglow
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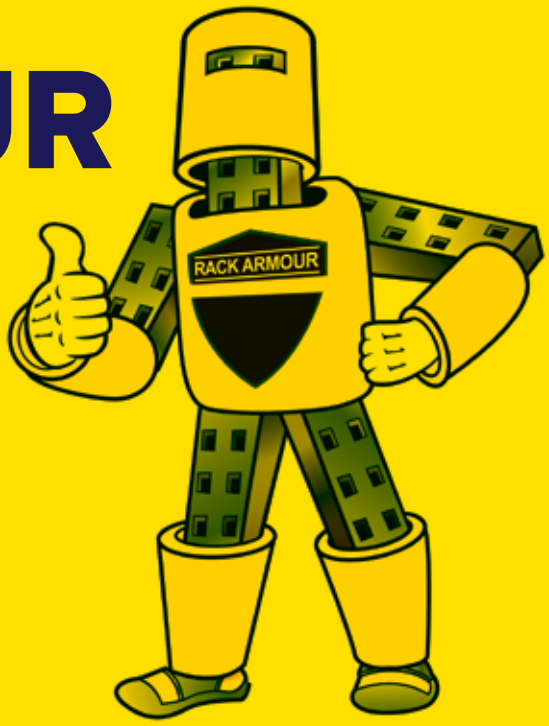

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CASE STUDY

‘Super’ sensors to make conditions safer for miners

Dr Toan Dinh, a mechanical engineer at the University of Southern Queensland, has designed sensors to help prevent injury and death on mining sites by detecting early mechanical issues in oil and gas pipelines. The sensors, made of silicon carbide, can withstand harsh and corrosive environments, and are five to 100 times smaller than the width of a single human hair. Dr Dinh spent six years developing the sensors, which perform a thousand times better than conventional sensors. Dr Dinh explained that current silicon technology can’t be used in harsh environments, because it cannot survive a long time in conditions of high temperatures and corrosion.

“The sensors I have developed can operate in up to 600°C for a wide range of applications, including oil and gas industries and aerospace technologies,” Dr Dinh said. Oil and gas exploration and production sites can be dangerous workplaces, due to the risk of fires and explosions. Dr Dinh said his sensors can help detect and measure the tiniest of movements in the environment, and monitor in real time the structural health of a system, such as a pipeline, in case there are any changes or faults. “It is critically important we make working conditions safer for miners and more efficient,” Dr Dinh said. “This can help prevent a major system failure from occurring, not only reducing maintenance costs but potentially avert a catastrophic situation that could lead to injury or death.”

Dr Dinh recently received a $440,675 grant under the Australian Research Council (ARC) Discovery Early Career Researcher Award scheme to further develop his research. The grant will enable him to travel to California, where he will collaborate with researchers at NASA’s Jet Propulsion Laboratory to analyse how the sensors could be used in space exploration. “It’s a very exciting opportunity and a great chance to focus on improving the technology’s performance so it can operate in more environments and applications. My goal is to start testing the sensors in real industry conditions as early as this year before they are ready for commercialisation,” Dr Dinh said. The ARC Discovery Early Career Researcher Award scheme provides support for researchers and creates opportunities for early-career researchers in teaching, research and research-only positions in Australia.

University of Southern Queensland
www.usq.edu.au

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CASE STUDY

Electric vehicle retrofit clears the air in underground mining

The TRITEV, an underground mine electric vehicle (EV), was showcased late last year in Newcastle in New South Wales' Hunter Valley and was believed to be the first fully battery electric retrofit 20-tonne loader suitable for deployment into underground hard rock mines, developed in Australia for the mining industry. The fully operational TRITEV prototype was designed through a collaboration between 3ME Technology and Batt Mobile Equipment, as a successful shift away from diesel run-vehicles, for Aeris Resources. With the TRITEV now complete, 3ME Technology believes the platform will help the drive to decarbonise and eliminate the issue of diesel particulate matter underground, while saving on the high OPEX costs associated with mine shaft ventilation and the running of an ageing diesel fleet.

The electric vehicle has been developed under the METS Ignited Collaborative Project Funds, which bring together Australian METS companies, global suppliers, mine operators, research organisations and capital providers to support and improve productivity and innovative capacity of Australia's mining equipment, technology and services (METS) sector. 3ME Technology CEO Justin Bain said the TRITEV is a result of a heavily collaborative effort with Batt Mobile Equipment, adding that 3ME is now in a position to replicate these models at scale. "It's been an absolute pleasure working with the team at Batt Mobile Equipment," Bain said. "Their industry knowledge, vehicle design expertise and mechanical acumen is second to none."

METS Ignited CEO Adrian Beer said the Newcastle showcase highlighted the capability of Australia's METS sector to improve sustainable mining practices. "METS Ignited Industry Growth Centre is pleased to support the commercialisation of technologies enabling safety improvements for Australia's mining industry and potential global partners," Beer said. 3ME Technology COO Martin Kime said the TRITEV has received interest from the underground mining industry in the battery electric retrofit of existing platforms.

Kime believes the interest is driven by the recognition that there is a need to remove diesel particulate matter underground. "Given the demand, we look forward to bringing jobs to the Hunter, helping with the COVID recovery whilst creating next-generation, clean battery technology!" Kime said. With a range of additional mining vehicles ready to be electrified, it is anticipated that the 3ME Technology and Batt Mobile Equipment partnership will continue with its quest to electrify underground mining to increase the standards of work health and safety for miners and benefit the environment.

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3ME Technology
www.3metech.com

MINING

ILLUMINATING UNDERGROUND MINES IN SELECTING LED STRIP LIGHTING

Carinne Pater, General Manager, Mineglow

©Mineglow

As the mining sector continues to strive for zero harm, effective lighting plays a key role in protecting the health, safety and wellbeing of underground miners and other hazardous area workers. Here are some of the key features to look out for in selecting LED strip lighting for underground mines.

Miners face many challenges in underground mine environments, such as high noise and high dust density, and low lighting is another significant challenge. Inadequate lighting in underground mining remains one of the leading causes of accidents, with new research showing that poor illumination has a significant effect on fatigue, attention, reaction ability and hand-eye coordination. When miners work in poorly lit environments, it affects not only operational efficiency but also increases physical hazards such as tripping and mental exhaustion (such as fatigue) that lead to safety incidents. With these hazards in mind, it's critical to provide appropriate lighting, both in colour and output, to allow mine workers to operate safely and productively.

Particularly in environments such as underground mining where there is no natural light available, it's critical to be able to provide workers with adequate lighting for the tasks they are performing. LED strip lighting has revolutionised industrial and hazardous work environments due to the increasing capabilities of light-emitting diode technology and the ability to provide a continuous strip of illumination, with advanced LED lighting technology being able to improve mine safety and productivity in several ways. Firstly, continuous illumination reduces glare and provides daylight conditions, enabling miners to easily detect hazards. Features such as 65k white light emissions (equivalent to daylight) also enable precise colour recognition, which is critical when working with wiring for instance.

An interactive warning solution that visually communicates alerts in the event of an emergency and directs underground workers to safety in emergency evacuations is especially beneficial. A chasing system that suits different applications and risk zones and offers high sight impact, visibility and reliability when it matters most is also beneficial, and the potential gains are significant. Not only in terms of safety and productivity, but also from a sustainability perspective. A durable design allows quality LEDs to last up to 50,000 hours, reducing operating and maintenance costs. Solutions with a long lifespan — of up to 10 years — and with low loss of luminescence over this period (such as 20 to 30%), even in the most challenging environments, ensure the light quality remains high.

A low-profile design that is extremely easy to position and install in any location, making the solution less likely to be damaged by underground mining equipment, is also an important consideration. Further, miners should do proper research into the product manufacturer and certifications, as not all LED strip lighting is created equal. When working in volatile environments with extreme temperatures, explosive gases, combustible dusts, corrosive fluids and high vibration, getting the right lighting solution for the right environment is critical.

As the market for LED strip lighting becomes more competitive, product design can vary greatly. Always purchase from a reputable partner, ensuring that your LED strip lights are fully certified, industrial-grade and approved for use in underground mines. Look for LEDs that have been rigorously tested for durability and are waterproof (IP 67), fire retardant and self-extinguishing, impact and shock-resistant. Premium-quality solutions have dust- and dirt-retardant properties, are blast-resistant, explosion-proof (IECEX certified) and can withstand up to 70 kg of pulling power. Ensuring your LED strip lights meet the highest local and international safety standards and certifications to perform in harsh and hazardous conditions is paramount to improving light quality and visibility, keeping your workforce safe, maximising productivity and efficiency, and reducing operating costs.

Mineglow
www.mineglow.com.au

Wearable technology platform

Preventure's wearable technology platform combines wearable sensors, data analytics, sports science concepts and AI-powered smartphone training modules. An Australian-based start-up with a global footprint, Preventure strives to translate lessons from professional sport and enhance workplace injury prevention programs, specifically targeting musculoskeletal back, shoulder and lower limb (slip, trip, fall) injuries.

The wearable technology platform is used by safety teams, allied health professionals and workers from a range of industries, from healthcare and manufacturing to food production, logistics, aviation and local government. Users can subscribe to the platform monthly and lease hardware, integrating the technology into manual handling and new employee training programs, pre-employment checks, injury investigation and return-to-work processes. With fast, remote onboarding, users can be set up and using Preventure as fast as the local postal service can deliver it.

The product was designed in partnership with the Australian Government, leading universities, workers and worker union representatives. The product is validated to international standards and has features that encourage worker participation. This includes no GPS tracking, worker data ownership and an overriding sports theme.

The wearable technology platform has no lock-in contracts, great trial packages and free virtual demonstrations on offer.

Preventure

preventure.live

Safety goggles

The Pilot 2 Neo from Bollé Safety is designed for tough environments, featuring a comfortable seal, adjustable Neoprene strap and wide field of vision. The model's co-injected, vented frame can be worn with prescription glasses and other PPE, for increased adaptability. The Pilot 2 Neo also has increased resistance to temperature, fire, tearing and chemical products, which makes it suitable for use in mining and petrochemical environments.

It is available with a clear or CSP lens for use in indoor or indoor-to-outdoor environments and includes Bollé Safety's Platinum anti-scratch, anti-fog coating for improved visibility and increased longevity.

Bolle Safety AU Pty Ltd

www.bollesafety.com.au

Lightweight industrial boot

The Blundstone #989 combines the elastic side safety boot with wheat nubuck leather, creating a lighter weight industrial boot packed with all the benefits of Blundstone's quality and durability. The boot is suitable for heavy industrial work. The Blundstone #989 is a wheat nubuck safety boot with key features including a rubber sole that is heat resistant up to 300°C, a steel cap toe, a TPU bump cap and the extra protection of electrical hazard resistance.

The Blundstone #989 also features a water-resistant nubuck elastic side safety boot; a low-density, shock-absorbing PU midsole with antibacterial agent; and a rubber outsole designed to increase slip resistance in varied environments. The rubber outsole is resistant to hydrolysis and microbial attack, and oil, acid and organic fat resistant.

The boots also feature SPS Max – XRD Technology in the heel and forepart strike zones for increased impact protection. A Removable Comfort Arch footbed with XRD Extreme Impact Protection forepart insert provides greater impact absorption and comfort. The footbed is also antibacterial, washable and breathable.

The boot's steel shank facilitates correct step flex point and assists with torsional stability. The Blundstone #989 is also designed to be electrical hazard resistant, with a broad-fitting, 200-joule, impact-resistant steel toe cap.

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IP66

CASE STUDY

Image-generating tech boosts construction site safety

Current safety compliance procedures involve placing cameras onsite to capture images of machinery — such as cranes, scissor lifts, bulldozers and dump trucks — in operation. From there, the images are labelled manually, including key points of each piece of equipment. The generated dataset is then used to train artificial intelligence (AI) models and inferences are made about the classification of different equipment, pose estimation and activity recognition. Now, technology developed by Monash University engineers will generate accurate, synthetic images of machinery, creating large datasets for training deep neural networks to analyse the use of machinery onsite and in a variety of conditions.

The new technology, developed by Dr Mehrdad Arashpour and his team of PhD students and postdoctoral researchers, will streamline safety, productivity and quality monitoring procedures on building, mining and construction sites. This new method, which is currently under Australian patent review, removes the need for cameras to be placed on construction machinery, which has time, cost and privacy implications. The technology can process millions of images of any type of machinery in a short amount of time, and provide detailed information on its key physical and operational features.

For example, before using an excavator at a building site on a wet day, workers can identify all the safety features of this equipment within a digitised version of the working environment, including rain and clouds as well as reduced light and visibility. Over time, this technology can be expanded and used on any and every construction site, depending on the type of machinery in operation. Dr Arashpour said this application has been designed to improve safety, productivity and quality on building sites and other workplaces.

"Operations involving heavy construction equipment are a critical component of most projects. Heavy construction equipment, vehicles and workers are often required to work closely due to spatial limitations and tight schedules, which often leads to suboptimal performance both in terms of safety and productivity," said Dr Arashpour.

Dr Arashpour added that preparing large datasets for specific tasks is currently a manual process that is time-consuming, labour-intensive, error-prone and subject to privacy concerns. "Our method randomises various critical features of the scene, such as equipment pose and texture, scene texture and lighting, camera location and field of view, and adds other elements to the scene such as simulated dust and occluding objects," said Dr Arashpour.

The novel Monash-developed method uses game engineering technology to generate CAD models of heavy machinery, which are then accurately and automatically annotated. Dr Arashpour and his team have tested several deep neural networks on the real images of the equipment. The results obtained by training deep neural networks using synthetic images are almost as accurate as real images. "As compared to traditional data preparation pipelines, the proposed method does not require any manual annotation, which is a labour-intensive and time-consuming process," said Dr Arashpour.

Synthetically generated datasets are also advantageous to manually labelled datasets, as they can produce pixel-level annotations for the key points of interest. In contrast, manually annotated datasets are susceptible to human error, and monitoring the quality of annotation can also be a cumbersome task. Dr Arashpour believes the new technology has the potential to modernise the building and construction industry and improve safety, quality and productivity.

Monash University
www.monash.edu

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LOOK UP AND LIVE
MACHINERY AROUND POWERLINES

Marnie Williams, Commissioner & Chairperson, Energy Safe Victoria

Energy Safe Victoria (ESV) — the regulator responsible for electricity, gas and pipelines safety in Victoria — has seen an alarming spike in the number of serious incidents involving machinery hitting powerlines. Following four serious incidents in regional Victoria over three weeks in April and May of this year, the regulator is pleading with machinery operators to take more care and to always, look up and live.

ESV's 'Look Up and Live' campaign has been reminding Victorians to be aware of powerlines for almost a decade. The campaign calls on workers to be aware of powerlines and plan how to safely undertake their work before they begin. While no one cause can be linked to the spate of incidents in April/May 2021 that was the impetus for my call here, a combination of complacency, poor planning, inadequate or no risk assessments, lack of training, distraction, worksite changes and time constraints have all been factors in the past. Fortunately, none of these cases involved a fatality, but similar incidents have done so in the past.

Last November, a 29-year-old farm worker was killed at Gerang Gerung in north-west Victoria, when the extendable boom on the telehandler tractor he was operating struck powerlines. It is also important to note that a number of additional near-miss incidents have recently been recorded where injury was avoided. Each of these incidents could easily have resulted in a fatality. There has been no pattern to the geography of these incidents, which have occurred right across the state, including the Goulburn Valley, Mornington Peninsula and Pakenham.

ESV is calling on everyone involved in moving and working with machinery to take more notice of their surroundings and to remember the impact that a serious incident can have on individuals and the broader community. To have four in the space of three weeks is deeply concerning. Anyone operating machinery such as cranes, crane trucks, tipper trucks or other farm machinery must look up, because incidents like these are preventable if operators of machinery take the proper precautions.

If operating this machinery, you need to be aware of powerlines before starting any work, particularly in rural and regional areas where single bare powerlines are often hard to see. You only need to see the consequences from these four incidents, which have all caused serious injuries and in some other cases people have died. They not

INCIDENT TIMELINE

4 MAY On Monday, 4 May 2021, an excavator sitting on top of a truck made contact with high-voltage powerlines in Pakenham, in Melbourne's south-east. 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 hospital in a critical condition.

30 APRIL 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.

27 APRIL On Tuesday, 27 April 2021, a man was left in a critical condition after the grain auger he was transporting hit high-voltage powerlines at a property in Harston, south-west 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.

12 APRIL 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.

only impact the life lost but also their loved ones and co-workers who are left devastated and forever changed.

Taking a couple of extra minutes to be more familiar with your surroundings to ensure improved safety is not unreasonable — and is essential. While ESV is unable to comment on the specifics of the incidents that have led to this plea for greater care in this area — as they are still being investigated alongside WorkSafe Victoria — I have set out some recommendations below for how those operating machinery around powerlines can carry out work more safely, and end with some tailored advice for those operating heavy machinery on farms — an area of particular concern when it comes to machines around powerlines.

Recommendations for staying safe while operating machinery around powerlines

- Always stay at least 6.4 m away from powerlines while doing any work operating or moving machinery.
- Understand 'No Go Zones'. These include rules and distances for safety clearances near overhead powerlines. People and equipment working anywhere near powerlines need to understand the No Go Zone requirements to stay safe and away from live powerlines.
- If in Victoria, use an ESV registered spotter when operating machinery near overhead powerlines.
- Monitor weather conditions closely — powerlines can sag in extreme heat and sway in strong winds.
- Take caution during different light conditions, as powerlines are more difficult to see at dawn and dusk.
- Remember that you don't have to make contact with a powerline for it to be fatal. Electricity can jump if equipment or machinery gets too close to powerlines.
- Take care when using tall machinery (cranes or augers), driving high vehicles, raising tipper trucks and irrigation pipes and climbing on top of machinery and storage silos.

Advice for those operating heavy machinery on farms

- Identify all areas where powerlines cross properties.
- Identify all electrical hazards before starting work — if in any doubt, contact the local electricity distribution company.
- Relocate bulk delivery storage sites to a safe area away from powerlines.
- Suppliers of bulk materials must ascertain, when taking orders, the delivery point on the farm for the load, the proximity of powerlines and what safety precautions are in place should there be powerlines in the vicinity.
- Never raise the tray of tipper trucks when underneath powerlines.
- Drivers should refuse to deliver loads if their safety is compromised in any way. Enlist the help of a person to act as a safety observer when operating machinery near overhead powerlines.
- Enlist the help of a person to act as a safety observer to make sure any machinery does not get closer than 6.4 m to powerlines.
- Display Look Up and Live stickers near the controls of any machinery or equipment that can be raised overhead.
- Monitor weather and light conditions closely — powerlines can sag in extreme heat and sway in strong winds, and are more difficult to see at dawn and dusk.
- Remember that electricity can jump gaps.

For more information on the Look Up and Live campaign, including stickers and brochures, visit www.esv.vic.gov.au/lookupandlive.

Energy Safe Victoria
www.esv.vic.gov.au

CASE STUDY

Short film generates awareness about electrical safety

Working near overheard power lines can pose significant risks, as a young Dalby farm worker discovered after a near-fatal workplace electrical incident. Following the incident, Jason Daniels is sharing his story, to raise awareness and give other young Queensland workers a voice. Daniels was 17 when the grain auger he was moving contacted an overhead powerline. The resulting massive electrical shock he suffered put Daniels in hospital for two months, including time in intensive care, with serious burns. A couple of years, multiple skin grafts and lots of physiotherapy later, Daniels is on the road to recovery. The next step is to share his story through an eight-minute film that highlights electrical safety issues and the importance of young workers being heard. The film is a bid to make farmers take a second to think about safety, especially when it comes to electricity.

"I want to warn others about the risks of working near overhead powerlines and get young workers to speak up if they believe the work they are doing is unsafe. Trust me, a serious workplace injury like mine has a major impact on you, your family and your mates," Daniels said. Queensland Industrial Relations Minister Grace Grace announced the release of Jason Daniels' story and noted that contact with overhead powerlines is one of the most persistent and problematic electrical safety risks in Queensland. "Despite his youth, Jason raised his safety concerns about the auger and the powerline but was told there was no time to lower it. Being ignored almost cost him his life," Minister Grace said. Daniels' safety film is part of a suite produced by Workplace Health and Safety Queensland to change attitudes towards working safety and promote positive behavioural changes. The films are shown on worksites at pre-shift 'toolbox talks' and in safety meetings, with some individual films having up to half a million views.

The state government's Electrical Safety Office is also working with energy networks, industry associations, community groups and the agricultural industry to increase awareness and improve work practices near overhead powerlines. In the past six years, 52 serious electrical incidents have occurred in Queensland involving overhead powerlines, and six people have died. People most at risk are farmers, construction workers and transport workers. AgForce Workforce and Safety Committee Chair James Stinson noted that many tasks on farms are often high pressure and time-critical, which makes safety and clear communication even more important. Stinson added that simple measures like flags or obtaining moving aerial markers are important, effective tools.

"It's vital the benefits of agriculture's flexible lifestyle and the seemingly casual nature of rural life don't result in a relaxed approach to safety, especially electrical safety. It's important producers take the time to identify potential risks on farm, powerlines near sheds and silos, for example, and communicate these clearly to all staff, no matter how long they have worked with you," Stinson said. Daniels' film shares the story of how quickly life changed for Daniels and his family after the grain auger he was operating contacted an overhead powerline. Jason and his mother Di shared their experiences in the film to raise awareness about having a safe system of work in place before starting work and urging employers to listen when young workers speak up with safety concerns. "Life can change in a heartbeat," Di Daniels said.

Workplace Health and Safety Queensland
www.worksafe.qld.gov.au

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AUSTRALIAN MADE DATASECURE

Safety shoes

The Puma Safety URBAN EFFECT style of safety shoes are inspired by cult sneakers while incorporating technology from the fields of sports and safety footwear. The Tri-Sole construction with EFFECT. FOAM provides optimal cushioning and a significant energy return, thereby reducing the impact on bones and joints, and reducing fatigue for workers on their feet all day.

The rubber outsole is 300°C heat resistant and slip resistant, while the fibreglass/composite toe cap reduces weight and provides extra toe space and 200 J impact protection. The URBAN EFFECT range is available in men's sizes UK 6–12 (Euro 39–47). As with all Puma safety style, the URBAN EFFECT range is certified to Australian Standards AS 2210.3.2019.

Trading Downunder Pty Ltd is the exclusive importer for Puma Safety in Australia and New Zealand.

Trading Downunder
www.tradingdownunder.com.au

Health and safety assessment tool

The Health & Safety Index enables users to talk with their entire workforce, receive feedback at scale and put all their voices in one place. The Health and Safety Index features an integrated set of survey questions to provide a holistic view covering four aspects: safety leadership, safety engagement, health and wellbeing, and safety systems. Results can be compared across business-specific demographics to identify blind spots and areas of focus. A simple (<10-minute) and statistically reliable (α >0.9) benchmark places people at the centre of what matters most.

Recent benchmark data showed a mismatch between organisation expectations "holding workers accountable" (71%) and responses from "workers stopping unacceptable behaviours" (57%).

Seek feedback at scale and focus on improvements that matter.

The Health & Safety Index was used by Lockheed Martin and produced results that allowed users to gain a greater understanding of the company's current state across safety, systems, engagement, and health and wellbeing. This enabled users to target their strategy further to align with the company's results.

Health and Safety Index
www.healthandsafetyindex.com.au

Respirator range

CleanSpace Respirators are designed to protect frontline staff from airborne contaminants. The respirators are positive pressure PAPRs, featuring a reusable system. The lightweight respirators are AS/NZS 1716 approved, offer a high level of protection and contain no belts or hoses, for comfort and compliance.

CleanSpace ULTRA is one of four exclusive respirators designed and developed by CleanSpace Technology. It is IP66 rated and water tolerant, making it suitable for wet-cutting stone or concrete. It is also compatible with either half-face or full-face masks suitable for workers in environments requiring face/eye protection.

CleanSpace Technology is a Sydney-based manufacturer of respiratory protection equipment for healthcare and industrial applications, found by a team of biomedical engineers with experience in respiratory medical devices.

CleanSpace Technology Pty Ltd
www.cleanspacetechnology.com

Impairment testing app

Scientifically validated by NIOSH, the AlertMeter can identify effects from fatigue, illness, drugs, alcohol, stress, dehydration and any other factor that can cause impairment, all within 60 s. Through the use of a touchscreen/smartphone, an interface displays a series of different shapes that the user must identify as being the same or different. AlertMeter then uses advanced algorithms to detect variances from the user's pre-established personal baseline, considering factors such as speed and accuracy, changes in test-taking behaviours, situational awareness, decision-making awareness, shape affinity, hand-eye coordination and memory.

If a user scores outside their normal range, a supervisor is automatically notified, giving them an objective basis to start a safety conversation with the right workers, at the right time. The AlertMeter does not discriminate on individual cognitive or language abilities, is non-invasive and non-confrontational, is simple and quick to use and can be easily integrated into existing company policies.

AlertMeter can be used by remote workers, does not disrupt productivity and encourages workers to take responsibility for their own state of mind. Users can also carry out multiple tests. AlertMeter is used throughout the USA, Europe, South Africa and Canada, and is now available to safety-conscious companies in Australia and New Zealand. Alert for Work is a distributor for the Predictive Safety AlertMeter.

Alert for Work
www.alertforwork.com.au

CASE STUDY

App provides safety net for lone workers

In an emergency, identifying exactly where help is needed is critical. If lone workers suffer injuries or face aggression whilst at work, their employees may be unaware and therefore unable to help. Workplace safety solutions provider StaySafe equips companies with a low-cost, easy-to-use solution to manage the safety of their lone workers. Employees are able to start a timed session in the app before they begin a period of lone work or travel. The StaySafe app gives employers visibility of the location and safety status of lone workers and allows them to check in safely once they have finished this session. If an employee fails to check in safely during a session or raises a panic alert in the app, monitoring agents, either within the organisation or at an external monitoring service, will be immediately alerted. They will then verify the alert and dispatch the appropriate assistance to the employee.

StaySafe has now partnered with location technology company what3words to help companies respond to incidents more effectively. The new what3words integration helps employers communicate the precise location of their lone workers to emergency responders easily, using just three words. what3words had divided the world into a grid of 3 x 3 m squares and given each one a unique what2words address — made up of three words from the dictionary. With the new what3words integration, monitors can give the exact what3words address to emergency responders to send help to that precise square.

Ambulance Tasmania was the first to use what3words to rescue an injured hiker in April 2020. Since then, it has served as a valuable tool for emergency services, particularly when locating casualties in rural or remote areas. Australia's emergency services have built what3words into their official life-saving app, Emergency+, which helps people to call the right emergency number and confirm their location. With what3words now available in the app, people can tell Triple Zero (000) exactly where they need help with three words. Officers on the ground and first responders can use the free what3words app to get directions straight to their precise location.

Don Cameron, CEO of StaySafe, said adding the what3words functionality to the StaySafe app simplifies getting responders to the exact location of an incident quickly. "The StaySafe app is the easiest to use lone worker solution available today. With 16% more coverage than any other lone worker app via our low signal mode, employers can be confident that their staff are protected wherever they are," said Cameron.

"Growing up on a farm, the fact that we had no way to describe an exact location troubles me to this day. What if a fire had broken out in a barn or if someone was caught in running machinery? With what3words now available in the StaySafe app, it's extremely reassuring to know that people working alone or in remote locations can tell emergency services exactly where help is needed fast enough to prevent extensive damage or avoidable injury," said Chris Sheldrick, CEO of what3words.

Safe Apps Ltd
www.staysafeapp.com

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GREENCAP ONLINE RISK SOLUTIONS

PROTECTION AGAINST RESPIRABLE CRYSTALLINE SILICA

A FOCUS ON COVERALLS

DuPont Personal Protection

Risks and worker exposures to hazardous fine particles like respirable crystalline silica (RCS) must be managed using the hierarchy of controls. From this hierarchy, personal protective equipment (PPE) serves as a strong last line of defence at work sites. Protective coveralls that minimise dust particulate penetration through to the garments being worn underneath the coverall are critically important.

Silica is silicon dioxide, which is a naturally occurring mineral that forms the major part of many rocks and soils (granite, shale, sandstone, sand). It's also used to make concrete, mortar and composite stones. Composite stones are often used to fabricate benchtops for kitchens and bathrooms, as well as other products. When workers fabricate these products (cut, saw, grind, drill, polish, etc), very small silica dust particles are generated, and become airborne.

From 1 July, the workplace exposure standard (WES) for RCS reduced by half in six Australian jurisdictions: the Australian Capital Territory, New South Wales, the Northern Territory, Queensland, South Australia and the Commonwealth. The move followed the reduction in the WES for RCS under the model Work Health and Safety (WHS) laws, and came after the implementation of the updated WES in the Victorian jurisdiction in December of last year.

The WES for RCS halved from an eight-hour time-weighted average of 0.1 milligrams per cubic metre (mg/m^3) to 0.05 mg/m^3 under the Work Health and Safety Regulations 2011, but risks and worker exposures to hazardous fine particles like RCS must still be managed using the hierarchy of controls.

How particle sizes affect compliance efforts

One of the more dangerous traits of RCS is the extremely small particle size, which allows them to flow when airborne, and travel on air turbulence (even indoors), for long periods of time. According to the National Institute of Environmental Health Services, the size of dust emissions from silica contain-

ing substances varies from 0.01 µm (micrometres) to 100 µm in diameter. For perspective, the diameter of the average human hair is about 70–100 µm.

Depending on their weight, dust particles must typically be 200 µm or smaller to become airborne and linger, while 50 µm and smaller particles are invisible to the naked eye. Particulate matter of ≤10 µm (PM10) is the approximate size threshold for particles to be able to penetrate the body's natural defences (mucus membranes, cilia, etc) and reach deep into the lungs, potentially causing serious health issues such as silicosis.

Managing risks and worker exposures to silica using the hierarchy of controls

According to the Model WHS Regulations, managing risks and worker exposures to silica can be achieved by selecting and implementing measures using the hierarchy of controls. More than one control will normally be required to adequately protect workers, and these are as follows:

> WORKERS CAN REDUCE THE RISK OF EXPOSURE TO SILICA BY WEARING DISPOSABLE COVERALLS THAT HAVE A LOWER AVERAGE TIL_A [TOTAL INWARD LEAKAGE].

- Substitution — such as sourcing composite stone benchtops with a lower percentage of silica.
- Isolation of the hazard — using principles of safe work design to designate areas for tasks that generate dust and appropriate worker positioning during these tasks, using enclosures and automation to conduct dust generating tasks.
- Engineering controls — that minimise the risk of exposure to generated dust, for example, local exhaust ventilation, water suppression (wet cutting) or using tools with dust collection attachments.
- Administrative controls — including good housekeeping policies, shift rotations and modifying cutting sequences.
- PPE — including appropriate respiratory equipment and *work clothing that does not collect dust.*

Work clothing that does not collect dust: a focus on protective coveralls and standards

Regulations require that disposable protective coveralls for handling hazardous particles meet the EN 13982-1 Type 5 standard. However, as the Total Inward Leakage (TIL_A) allowed under this standard is very high (15% in 8 out of 10 suits tested); the more stringent standard of EN 1073-2 Class 2 is desirable, as this requires the Average TIL_A to be less than 2% for 6 suits tested.

Workers using coveralls that meet the EN 13982-1 Type 5 Standard may be unaware that up to 15% of the hazardous fine particles may be entering inside the suit. If appropriate decontamination procedures are not implemented, this can lead to secondary inhalation of silica particles by the worker and family members, if contaminated garments worn under the disposable coveralls are worn home.

Workers can reduce the risk of exposure to silica by wearing disposable coveralls that have a lower Average TIL_A. Barrier fabrics with the ability to evacuate body moisture, while still providing excellent particle holdout, will provide the ideal balance of comfort and protection against silica, asbestos and other fine particle hazards.

DuPont Personal Protection
www.safespec.dupont.co.uk

CASE STUDY

Autonomous mobile robots boost safety and efficiency

NP Fulfilment has achieved operational efficiency and improved safety in its smart warehouse in Sydney, with the implementation of Konica Minolta's MiR autonomous mobile robots (AMRs). NP Fulfilment is a leader in order fulfilment for national and international businesses, with hundreds of online retailers, direct sellers and e-commerce organisations using it to pick, pack and ship their orders every day. An existing customer of Konica Minolta, NP Fulfilment drew upon the trusted partnership between the two organisations to purchase two MiR200 AMRs.

The MiR200 is a safe, cost-effective mobile robot that quickly automates internal transportation and logistics. The robots optimise workflows to free up staff, increasing productivity and reducing operational costs. Konica Minolta developed a latching module for the MiR200, giving it the capability to latch onto NP Fulfilment's shelving systems with wheels. Once full, the MiR200 transports the shelving system, picks up an empty shelving system, and then parks the empty trolley in an available spot on the way back to pick up the next full trolley.

Jey Kanagaratnam, CIO of NP Fulfilment, noted that a rapid increase in online shopping prompted the organisation to look at ways to further speed up picking at the Sydney warehouse, while ensuring employee safety and efficiency. "To achieve this, NP Fulfilment has transformed warehousing by accelerating and using the most advanced technology in the logistics industry, including our propriety 3PL warehouse management system that we have built from the ground up. Turning to technology was a no-brainer. It was also important for NP Fulfilment to work with organisations that have an innovation mindset," said Kanagaratnam.

Matthew Hunter, Innovation Product Marketing Manager at Konica Minolta, said the organisation has experienced a rapid growth in robotics, particularly in the warehouse and logistics sector, as the industry moves to smart warehousing. Hunter added that the MiR200 AMRs minimise unnecessary movement around warehouses, thereby saving worker time. "With the MiR200s handling the movement of trolleys, workers are kept in a focused area of the warehouse where they can add the most value, rather than travelling back and forth to move trolleys. Less movement also means lower risk of accidents, which is critical for NP Fulfilment in meeting its safety requirements," said Hunter.

Alongside speeding up the process, the MiR200s enhance NP Fulfilment's ability to capture the movement of the product at each stage in the logistics life cycle, including how long it spends at each stage and the time it takes to get from one stage to another. "This means key performance indicators can be monitored at each and every level, providing insight to make improvements that can be passed on to NP Fulfilment's customers," said Kanagaratnam.

Konica Minolta Business Solutions Australia Pty Ltd
www.konicaminolta.com.au

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**See website for more information*

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Safety boot

Blundstone has launched the #984, an extension of the XFOOT rubber range. The new boot features all the benefits of Blundstone's safety and comfort features, to suit tough environments. Distinct features include water-resistant stone colour nubuck leather, YKK heavy-duty zip and thermal regulating bamboo lining for all-day breathability. The #984 boot provides underfoot comfort with its inclusion of XRD Technology for underfoot cushioning, as well as electrical hazard resistance and a moulded TPU bump cap for additional durability and leather protection.

The #984 boot comes with seven eyelet lace with a lace locking device, a padded tongue and collar, and a low-density shock absorbing PU midsole with antibacterial agent. The rubber outsole is designed to increase slip resistance in varied environments, and is highly resistant to hydrolysis and microbial attack. The rubber outsole is also heat resistant to 300°C, and oil, acid and organic fat resistant.

The boot also features SPS Max – XRD Technology in the heel and forepart strike zones, for increased impact protection. This is enhanced by the removable comfort arch footbed with XRD Extreme Impact Protection forepart insert, for greater impact absorption and comfort. The footbed is antibacterial, washable and breathable, with a broad fitting, 200-joule, impact-resistant steel toe cap. The boot's steel shank is designed to ensure correct step flex point and assists with torsional stability.

Blundstone boots are available online and in stores via select retailers throughout Australia, and are backed by a 30-day comfort and six-month manufacturing guarantee.

Blundstone Australia Pty Ltd

www.blundstone.com.au

Lightweight automated external defibrillator

Help save the lives of your co-workers with a Philips AED. Designed to be rugged, lightweight and reliable, the Philips HeartStart FRx can withstand rough handling and extreme temperatures. When every minute counts, Philips HeartStart FRx provides step-by-step help for rescuers.

With the occurrence of sudden cardiac arrests in high-rise buildings, especially in construction sites where amenities are at a minimum, first responders often face challenges in administering the right treatment quickly. Having an AED on-site helps to provide treatment of SCA within 8-10 minutes.

Philips Healthcare

www.philips.com.au/healthcare

Crash barrier system

Tru-Gard is a certified steel safety barrier system, suitable for workplace traffic management, car parks, construction safety zones and any commercial or industrial applications. Impact tested by independent engineers using 3D CAD modelling systems, Finite Element Analysis (FEA) and physical testing, Tru-Gard barriers are certified to AS/NZ structural standards, offering accredited protection against vehicle impact. The steel safety barrier is a proven solution for avoiding forklift damage to buildings and assets, as well as providing personnel safety.

The modular system includes a range of accessories and components, including the addition of hand rail systems and personnel gates. The small Tru-Gard footprint makes it suitable for tight applications, taking up very little space onsite. The Tru-Gard Certified Safety Barrier can be used to strengthen traffic control, prevent vehicle damage and expensive repairs, and provide secure personnel protection.

Tru-Bilt Industries

www.tru-gard.com.au

Cut protection F gloves

Ninja has released a range of high cut protection F gloves, engineered with lightweight 18 Gauge Kevlar liners and finished with a palm coating of Nitrile New Foam Technology (NFT) to provide protection, comfort, durability and grip. Unlike other Cut F resistant gloves on the market, the Ninja Razr Slashtec range includes style variations which cater to different work tasks, including a glove designed for both cut and impact protection, a style with extended wrist protection and a full dip version for added protection against exposure to liquid and oils.

The Cut F range includes Kevlar liners that provide 360° cut protection, a breathable Nitrile NFT coating that provides grip in oily, dry and wet conditions, touch screen compatibility, thumb and forefinger reinforcement for improved durability and a Fit Smart design that enhances glove comfort. Together, these features enhance wearer safety, performance and compliance, particularly for users handling sharp and hazardous objects for long periods of time.

The Ninja Razr Slashtec range includes four Cut Protection F styles, tested to the EN388:2016 and AS/NZ 2161.1:2020 Cut Standards, as well as a Cut D version made from lightweight 18 Gauge para-aramid steel composite yarn and a Nitrile foam (NFT) coating.

Bunzl Safety

www.bunzlsafety.com.au

Enclosed intermediate bulk container

The Polymaster Enclosed IBC Bund addresses concerns and issues with storing and handling chemicals in IBCs. Up until now, there has been a limited range of free-standing, all-weather units that can encase an IBC and at the same time provide safe and clean dispensing options.

In the event of an IBC rupture, the unit would contain the entire contents within itself, preventing any chemical entering stormwater or the surrounding area, as the design exceeds AS3780-2008, The Storage and Handling of Corrosive Substances, bunding requirements of 110%.

Operators have free and easy access via outward swing doors. Each door has clear viewing panels so that an operator can see inside without putting themselves at risk in the event of a spill. The unique door design acts as a splash guard, ensuring no chemicals can exit the unit.

The wide-opening doors allow an IBC to be easily forklifted into position from either side or rear. Extra clearance on all sides of the opening is advantageous to outside storage where forklifts may be operating on uneven ground.

The Enclosed IBC Bund includes a built-in vent to expel gases and a 250 L day tank for continuous dosing if incorporated into an inline process.

The day tank has safe, quick connect/disconnect hoses to minimise spillage/splashing and a sight tube for the operator. A mounted audible and visual low-level alarm can be viewed through viewing panels.

The front cabinet can either accommodate a fully customised dosing system or an off-the-shelf dispensing kit suggested by Polymaster that suits chemicals.

Polymaster Group

www.polymaster.com.au

3D radar safety system

The Leuze LBK radar system responds to movements and generates a switching signal as soon as a person enters or exits the monitored area. The 3D safety system monitors danger zones, even in the event of sparks, dirt and dust.

The radar technology can differentiate between people and static objects and can detect stationary persons located in the protected area. Static objects, such as pallets or material containers, can be left in the protected area without problem. They do not result in a system interruption.

The safety radar system is primarily used in restart protection and for monitoring hidden areas. However, it can be adapted to individual requirements with the number and position of the sensors, the adjustable operating range and the selectable opening angle.

The system uses its FMCW technology to monitor areas on steps or pedestals and behind non-metallic shadowing. To safeguard larger areas, up to six radar sensors can be connected together via a controller. In this way, the system offers a maximum monitoring area of 15 x 4 m.

The individual sensors can be connected to form groups. If necessary, these groups can be switched off, thereby allowing the system to adapt to dynamic processes. The safety radar system also enables users to use the easy-to-operate configuration software to define the system parameters.

Leuze electronic Pty Ltd

www.leuze.com.au

Custom-printed tags

Cirlock has released a range of custom-printed tags that are printed on durable poly material or are available as economic cardboard tags, with a good outdoor lifespan.

Cirlock supplies the tags in any quantity, at good prices with a fast turnaround of five days or less on smaller runs. Quantities of 200 custom tags or less can easily be accommodated, there is no minimum order, although a minimum charge may be applied.

The tags can be fully customised and are available with or without grommet/string. The custom-printed tags are manufactured in Australia, by Cirlock.

Cirlock

www.cirlock.com.au

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ARE YOU OVER-VENTILATING YOUR PATIENT

Bag-valve masks have been the standard of care for decades, but it's hard to know how much air a patient is getting with each squeeze. Guidelines suggest a rate of 10 breaths per minute when ventilating a patient, but the average provider has been shown to deliver an average of 30 ventilations per minute — nearly three times the recommended rate.[1]

Real-time clinical feedback has been shown to improve patient outcomes. The new X Series® Advanced monitor/defibrillator from ZOLL® provides real-time clinical feedback for CPR and ventilation to help address cardiac arrest, traumatic brain injury and more.

"Science is showing us that to squeeze the bag a little bit inappropriately for one or three or 10 breaths can actually have an impact on outcomes," said Drew Hoffman, a paramedic and a clinical support specialist on the ZOLL EMS team. "There is no set standard on BVMs, and the volume will vary with the size of hands of the provider, whether or not they're using one or two hands and how aggressively the BVM is being squeezed."

Without feedback, it's easy — even likely — to deliver excessive ventilation that can cause decreased coronary perfusion and create serious secondary problems like barotrauma or ARDS from overinflation.

"There is no defined volume per squeeze, so you're just eyeballing something that is vitally important for your patient," said Hoffman.

But measuring the patient's EtCO2 levels and other key metrics during ventilation can eliminate the guesswork when it comes to BVM use.

USE REAL-TIME FEEDBACK TO IMPROVE VENTILATION

Access to real-time clinical feedback on the scene has been shown to improve patient outcomes with CPR. For years, ZOLL devices have provided real-time clinical feedback on CPR to help rescuers deliver high-quality compressions to patients in cardiac arrest.

"We know for a fact that feedback helps us do better CPR," said Hoffman. "I honestly can't imagine, as a provider, doing CPR on someone without feedback — it's unthinkable."

Now, ZOLL is applying the same approach to ventilation to help Emergency providers better manage a variety of conditions with its new X Series Advanced monitor/defibrillator. With real-time feedback for compressions, ventilation and more, emergency medical providers can better serve each patient with peace of mind that they are doing the right thing at the right time — as well as improve their skills overall.

For cardiac arrest patients, the X Series Advanced monitor/defibrillator offers both Real CPR Help® and Real BVM Help™, giving providers simultaneous real-time feedback on both compression and ventilation quality. In the Real BVM Help Dashboard, providers can view delivered tidal volume and rate on the monitor, as well as ventilation rate and depth, a ventilation quality indicator and a countdown timer.

"Unchecked BVM use can lead to hyperventilation, and that will pressurise your patient's chest and lead to poor outcomes. Real BVM Help gives us real-time feedback, and it's adjustable for absolutely every patient that we encounter," said Hoffman. "You can focus in on every squeeze of the bag and objectively evaluate how did you do? Was the ventilation a problem? Did it cause an outcome that we didn't want?"

Real BVM Help works with any standard-sized commercially available airway management device for both intubated and non-intubated patients, and the data can help providers maintain balance of key levels for a variety of patient conditions.

BETTER MANAGE TBI PATIENTS WITH FEEDBACK

Traumatic brain injury patients present a unique set of challenges, and early management is critical to minimise common secondary injuries.[2]

Traditionally, TBI management has included efforts to control potential brain bleeding by hyperventilating patients to decrease intercranial pressure by limiting oxygen and causing blood vessels in the brain to shrink. But this literally starves the brain, warns Sean Culliney, a paramedic and a clinical support specialist on the ZOLL EMS team, leading to a potential cascade of adverse events.

"The problem is that it goes off the rails really fast. We can absolutely control intercranial pressure, but it's at the expense of all of our neurons," he said. "We're clamping those vessels down and we're actually starving the brain for blood, and that is a very bad thing for our patients."

The TBI Dashboard on the X Series Advanced provides real-time data to help guide providers in managing this complex condition.

"The tricky part about the human body is that it is on a tightrope basically at all times, so it's a very narrow path that we walk, and if we get off of that path a cascade begins to happen," said Culliney. "If I hyperventilate or hypoventilate — if I go either way off that tightrope — a series of things starts happening, and it's really difficult to get them back under control. Achieving a good pressure in the brain is useless if now my carbon dioxide level is dropping."

Ultimately, he says, Real BVM Help and the TBI Dashboard can help providers achieve the proper balance for patients and assure providers that they are delivering the best possible care.

"It helps us stay right in the middle, where we need to be," he said. "It's a large puzzle, and Real BVM Help steadies our hand."

USE DATA TO IMPROVE OPERATIONS, SUPPORT TELEHEALTH

In addition to supporting time-sensitive patient care, data from the X Series Advanced can be used to improve overall practices as well. With RescueNet® CaseReview, clinicians and medical directors can view data, including ventilation and CPR performance, after the fact for effective quality assurance.

The technology also supports telehealth and treatment in place, which continue to increase as a result the pandemic. With ZOLL's remote viewing telehealth technology, healthcare professionals can view data from the X Series Advanced from a remote location to provide decision support for emergency rescue providers in the field.

"Real-time feedback is absolutely a critical priority in using a BVM, and the X Series Advanced provides that feedback in a way that helps everyone deliver the same care," said Hoffman. "I think in 10 years people are going to say, 'I can't believe we ever did ventilations without this.'"

Visit ZOLL for more information.

*Article written and previously published in EMS1

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CNC MACHINING
5 WAYS TO INCREASE IT WITHOUT SACRIFICING SAFETY

Emily Newton, Editor in Chief, Revolutionized

The use of computer numerical control (CNC) equipment boosted output in machine shops because the associated processes function through computer programming rather than wholly through an operator's manual steps. Even so, there are ongoing steps to increase efficiency. Here are five ways to do that without putting people's safety at unnecessary risk.

1. Use the right tools for the job

Some machine shop operators make the costly mistake of purchasing the least expensive CNC tools available and then altering them to perform outside of their intended purposes. They believe that such alterations will keep efficiency levels high without requiring them to make proper upgrades. However, this approach can cause accidents and other unintended consequences, such as wasted materials. Safety managers should remind shop employees to never use CNC machines in ways that go beyond the manufacturers' specifications, even if doing so initially seems like a way to achieve better productivity.

2. Bring connected sensors to the process

The 'Industrial Internet of Things' has proved crucial for helping professionals in various industries increase efficiency while keeping safety levels high. For example, smart sensors can spot abnormalities that humans may miss. Additionally, smart sensors

also unlock possibilities in machine-to-machine communication. If a machine shop automates parts of the process, such as handling finished pieces, efficiency levels stay high while injury instances remain low despite the higher output potential.

3. Consider getting a Quality Standard Certification

Focusing on maintaining high quality in a CNC machine shop tends to have positive effects on safety, too. For example, if a machine shop gets ISO 9000 certified, more accountability and improved process standardisation are among the benefits. Certain industries also have specific ISO standards to follow. For example, AS9100 is for the aerospace industry. It encompasses the ISO 9000 stipulations, plus additional quality and safety requirements.

Components of the ISO 9000 standard encourage companies to measure improvements, enable open discussions about problems and evaluate the individual performance of employees. Together, priorities like these can make CNC machining safer and more efficient. Getting certified is not the only way to improve safety, of course. However, it can give company leaders more direction as they make organisations more resilient.

4. Focus on continuous improvement

Sticking to the same processes over time is not always the best way to maintain efficiency or safety. For example, a company may initially have a reactive maintenance strategy, meaning that people only tend to machines once issues become apparent. However, using a real-time, preventive approach can give equipment more uptime while emphasising safety. Prioritising continuous improvements is an excellent way for company leaders to see what's working well or requires more attention.

At Levy's Machine Works, managers invested in continuous improvement, bringing a 15–20% revenue boost and cutting operational losses by almost 11%. Ongoing audits look at almost 75 aspects of the workflow, keeping everyone more aware of the need to maintain safe practices and identify environmental dangers. For example, company leaders realised that randomly placed drill holes created slipping hazards when material escaped from the spill tray. Using a drill template for the barrels tackled that problem while reducing annual losses.

5. Know when to increase investment in a particular machine

Thorough maintenance strategies go a long way in keeping CNC machines safe and performing well. However, it's not always sufficient to keep repairing one, especially if it's old or has a history of safety issues. In such cases, safety managers must decide when to take more extensive action. For example, retrofitting a CNC machine with a newer control can make it easier to program and more user-friendly overall. Older CNC machines may also pose additional safety hazards.

Most newer models have door safety features that don't allow people to reach inside until the machine stops running. However, older equipment often has locks that are easy to override, defeating the purpose of putting them on a machine at all. Another option is to repurpose a machine to make it fit a different need. People who choose this route should always get professional guidance. Trying to repurpose a machine with the sole goal of cutting costs raises the risk of accidents.

Welcome worker feedback

Making CNC machining more efficient while maintaining safety should be an ongoing effort rather than something leaders do quickly to address a suddenly apparent problem. When employees see that safe practices are foundational elements of a workplace's operations, they'll be more likely to follow all rules and not take any shortcuts that could put them at an elevated risk.

Besides considering these five tips, safety managers should engage in regular conversations with workers. Asking them about any dangers they've spotted or inefficiencies that continually frustrate them could illuminate other problem areas to target. When workers feel heard during discussions about achieving safety and a high output, they'll feel more willing to contribute ideas about how to reduce accidents while improving productivity.

Revolutionized
www.revolutionized.com

Gas detection program

Gas detection plays a fundamental role in safeguarding workers and worksites from flammable and toxic gases, which are invisible dangers. MSA Safety io gas detection program is supported by seamless connectivity with a track record of safety and support. It also features fast-responding sensors that are durable and low-maintenance.

Drive safety improvements and accountability with a connected gas detection program.

The digital transformation is well underway and digital services are becoming more important than ever in the gas detection industry, creating both new opportunities and challenges. The MSA Safety io cloud solution will support users in this digital transformation and help to improve safety outcomes.

MSA Australia Pty Ltd
au.msasafety.com

Monitor/defibrillator

The ZOLL X Series Advanced monitor/defibrillator helps providers manage patients more effectively by providing the clinical data Emergency Medical teams need to improve outcomes. The X Series Advanced comes with new features, including Real BVM Help, TBI Dashboard, RescueNet Live (not included) and enhanced CaseReview functionality.

ZOLL has introduced Real BVM Help, a technology that is only available on its new X Series Advanced monitor/defibrillator. Real BVMP Help provides clinicians with real-time ventilation feedback on volume and rate for both intubated and non-intubated patients.

The ZOLL X Series Advanced with Real BVM Help gives providers target and delivered ventilation volume, target and delivered ventilation rate, and a ventilation quality indicator and countdown timer. Real BVM Help works with any standard-sized commercially available airway management device for intubated and non-intubated patients.

For cardiac arrest patients, the X Series Advanced offers Real CPR Help and Real BVM Help, giving providers simultaneous real-time feedback on CPR and ventilation quality. When used with adult ZOLL CPR electrodes, the X Series Advanced displays the Real BVM Help Dashboard next to the Real CPR Help Dashboard.

The X Series Advanced monitor/defibrillator features a TBI Dashboard, to enable rescuers to see trending data on critical parameters to treat and manage traumatic brain injury (TBI) patients. Integrated into the TBI Dashboard, Real BVM Help guides clinicians in providing manual ventilations to intubated and non-intubated patients.

RescueNet Live, a telemedicine solution from ZOLL, enables clinicians to view real-time data from the X Series Advanced at remote locations via a cellular or Wi-Fi connection. RescueNet CaseReview enables providers to view data from the X Series Advanced post-case for effective QA/QI. It can send files directly to secure systems for performance focused debriefing. Access to data, including ventilation and CPR performance, is as fast as opening a web browser.

ZOLL Medical Australia
www.zoll.com/au

Welding helmet

Generation 5 is the latest collection of 3M Speedglas welding helmets and showcases a range of features.

Part of this collection is the Speedglas G5-02, which was more than 20 years in the making and is reportedly the world's first welding helmet providing a curved auto-darkening lens that creates wider views in a slimmer helmet that follows the curvature of the head for optimal weight distribution.

The G5-02 lens has an all-new light state of 2.5 to maximise the effect of True-View optics and provide lighter, brighter and more realistic colours. Overall, the G5-02 sets a standard for precision viewing for professional TIG welders involved in high-performance, critical work.

AWS Pty Ltd
www.awsi.com.au

Protective face shield

The RFU837 UniMask protective face shield provides a high level of breathing protection with enhanced inner airflow regulation and a visor with good optical and mechanical features. The face shield features a TH3 class of breathing protection, with an anti-fog/anti-scratch coating. It has good optical quality (EN 166 class 1) and is also safety helmet compatible. Easy to use and adjust, the face shield is also lightweight, weighing 380 g, with a neoprene or textile face shield option. The visor also features high mechanical resistance.

The face shield has a range of applications and is suitable for the use in refineries, and in the building, automotive and shipbuilding industries. The UniMask protective face shield also facilitates quick and easy changing of the visor; in case the visor needs to be replaced or separately cleaned, it can be removed easily and attached back to the hood using two separate locking knobs.

The UniMask also features a quickly interchangeable face seal with easy maintenance. The face seal provides a secure and comfortable fit for the wearer, due to a fast click-in system that enables the face seal to be quickly removed and attached back. The face seals can be washed in a washing machine and even dried in the dryer. UniMask also regulates inner airflow, and can be used with a range of standard safety helmets to provide a handy solution of head protection combined with protection of the face and respiratory system.

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CASE STUDY

Access systems facilitate staff safety for port authority

The Port Authority in Western Australia was established following the *Ports Legislation Act 2014*, which consolidated seven of Western Australia's eight port authorities into four new regional port authorities. The Port Authority strives to become the global leader in port planning, operations and marine services, and continuously improves its operations for the benefits of customers, stakeholders and communities. The Port Authority engaged Treadwell to provide new handrails as well as an access ramp, to facilitate safe access for staff.

In response, Treadwell supplied its Access Systems GratEX FRP Mini Mesh Grating and RailEX Round Handrails. Treadwell overcame many challenges over the course of the project. The exposed marine environment accelerated corrosion on structures in the vicinity. However, with their track record of performing beyond expectations in similar environments, Treadwell FRP products provided durability and dependability.

The chosen material for the handrails also had to have low thermal conductivity so that it would be safe to use even in high temperatures, while remaining robust in the outdoor environment. The RailEX Round handrails were assembled accordingly, using a zero-weld method that reduces the chance of corrosion. RailEX is also a suitable alternative to metallic handrails and offers electrical transparency, while being non-conductive in nature.

The Port Authority also required the selected grating to be anti-slip, to ensure the safety of users. Treadwell fabricated and modified FRP onsite, omitting any need for a hot works permit. The lightweight and easy-to-install nature of the product made FRP very manageable during construction. Any system utilising FRP is also virtually maintenance free, due to the nature of FRP, thereby minimising maintenance costs.

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www.treadwellgroup.com.au

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OCTOBER IS MENTAL HEALTH MONTH

SAFETY MATE HAS LAUNCHED THEIR *NEW BLACK DOG CUT D GLOVE* TO SUPPORT THE WORK OF THE BLACK DOG INSTITUTE

Mental health in the mining industry is becoming widely acknowledged as an important component in business stability, workforce and even productivity. 20% of Australians will experience symptoms of mental illness each year.

The Black Dog Institute does important work in this space. The new Black Dog Cut D glove from Safety Mate has been launched to support this important cause.

For every pair of Black Dog Cut D gloves sold, Safety Mate will donate $1 to the Black Dog Institute so they can continue their important work.

Choose the Black Dog Cut D gloves for your next order of cut resistant gloves and know that you're making a difference by supporting mental health initiatives in your community.

Contact us for trial samples or to find a local distributor.

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