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SAFETY SOLUTIONS
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CONTENTS

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PROTECTING OUR LUNGS
WITH RESPIRATORY PPE

Terry Gorman, Senior Occupational Hygienist, 3M Personal Safety

Our lungs have evolved over thousands of years to deal with naturally occurring levels of particles — dusts, pollens, small pieces of vegetation, seeds, etc. We have developed certain protective mechanisms such as nasal hairs, mucous-lined airways and even coughing and sneezing as ways to control exposures to reduce the chance they cause significant damage to our respiratory system. But this protection can only go so far. Modern industrial processes can expose us to a myriad of substances that do not occur naturally and we have little or no effective defence against many of these without PPE.

We breathe in about 8–10,000 L of air per day when just sitting quietly. Working hard physically increases this amount significantly. Each of these litres of air may contain a level of a substance that can enter the lungs and damage its structure directly or be absorbed into the bloodstream and cause health effects in other parts of the body. Effects can range from simple irritation right through to permanent incapacity or lethal outcomes such as lung cancer. The time frame for these effects can be immediate (eg, a whiff of strong ammonia will cause an immediate response) or long term (some exposures can take years for the health outcomes to appear eg, coal dust and asbestos).

Airborne contaminants we can inhale come in two broad categories — particles and gases/vapours.

Particles come in a wide range of materials (eg, dust, pollens, welding fume, asbestos fibres and paint spray) and sizes. Some will stay suspended for many hours long after they have been released into the air. Our lungs have some protective mechanisms to capture particles we inhale, but these are not able to deal with large exposures that can occur in workplaces.

Gases and vapours are more insidious. Our lungs are designed to inhale air (a mixture of gases) deep into the lungs so that oxygen can be absorbed into the bloodstream. Unlike particles, our lungs do not have any effective filtering system to capture gases and vapours, so these can travel deep into our lungs and may then get absorbed into our blood.

Health effects from overexposure to these airborne contaminants can vary from short-term effects like stuffy nose, sore throat, headache, coughing, nausea and irritation to longer-term health issues such as lung damage with reduced lung function, fertility, emphysema, neurological effects, heart damage and cancer.

Protection in the workplace

A Respiratory Protection Program run according to the guidance in AS/NZS1715 is needed for workers to achieve a safe, reliable and ongoing level of protection from airborne contaminants in Australian workplaces.

The laws of the states and the Commonwealth mandate the use of appropriate strategies to provide a safe workplace. Employers are required to use appropriate means to prevent health hazards to the workers. Providing respiratory protection for workers is part of the duty of care of the employer in the modern industrial situation.

Each workplace will have its own problems and hazards and will require assessment by a suitably qualified person to determine if there is a need for respiratory protection and, if so, what specific types of respirators are needed.

Ideally, there will be controls that keep these airborne contaminants to a minimum, eg, using materials that do not create a respiratory hazard, use of extract ventilation, use of sealed delivery and mixing systems, etc. However, there will be circumstances where personal respiratory protection is needed. The challenge is to wear the right respirator to make sure we protect ourselves from these hazards. By wearing a well-fitted respirator 100% of the time exposed, you can greatly reduce your health risks, both short and long term.

Respirators are designed to reduce and control exposures to substances, aiming to

> EACH WORKPLACE WILL HAVE ITS OWN PROBLEMS AND HAZARDS AND WILL REQUIRE ASSESSMENT BY A SUITABLY QUALIFIED PERSON TO DETERMINE IF THERE IS A NEED FOR RESPIRATORY PROTECTION AND, IF SO, WHAT SPECIFIC TYPES OF RESPIRATORS ARE NEEDED.

protect to levels that should not be hazardous to most wearers.

The basis for selection and performance of respirators in Australia is normally based on a number of documents, with the relevant Australian Standards being paramount. These are:

- AS/NZS1715 "Selection, use and maintenance of respiratory protective devices" provides users with the information they need to use appropriate respiratory protection systems. It gives them guidance on the selection factors and types of respirators available, their performance and their applications.
- AS/NZS1716 "Respiratory protective devices" is the performance standard. It sets out the performance parameters and requirements for the different types of respirators. State OHS regulators, eg, Safework NSW, Worksafe Victoria, etc, normally expect respirators used in Australian workplaces to meet the requirements of this standard.

There are other relevant state and federal regulations and codes of practice that specify the appropriate level of respiratory protection to be used for certain tasks eg, for use when removing asbestos or when spraying two-pack paints containing isocyanates.

Assessing the hazard

There are a number of basic requirements needed to assess a respiratory hazard. The first is to identify the contaminant, and then to quantify the amounts of the airborne contaminant in the working environment. In some cases, this may require the use of an occupational hygienist or safety professional, who will have the knowledge and resources to determine the airborne concentrations of the materials in question, and to make informed recommendations as to the appropriate responses to the hazard.

Specific high-risk respiratory hazards such as working in confined spaces or Hazmat response will require specialised equipment and assessment of the circumstances. This should be done by a suitably qualified occupational hygienist or safety professional.

After identifying the type and size of the respiratory hazard, suitable respiratory equipment for these conditions should be identified. Normally there will be a number of options, depending on the local conditions, wear time, cost and other factors, that will help to decide the appropriate equipment. Advice from manufacturers of respiratory equipment can assist in determination of the suitability and limitations of respiratory equipment.

Providing the equipment

The most widely used respirator type is the air purifying respirator — this uses one or more filters to remove contaminants from the inhaled air. These are powered by the wearer's own breathing cycle. Included in this category are maintenance-free or disposable type respirators as well as re-usable type respirators in both half face (covering the mouth and nose only) and full face respirator (covering the whole face and eyes) designs. According to the contaminant, a particulate filter is needed to capture particles and/or a specific gas filter is needed for various classes of gases or vapours like ammonia or acid gases or solvent vapours, etc. The user must determine the correct type of filter and respirator to protect him/her from the specific type and quantity of the airborne contaminants present in his/her workplace.

Getting the right fit

An issue of critical importance for any face fitting respirators is facial fit. There are many reasons why a respirator may not fit on a specific worker's face — facial contours, facial hair, heat, strenuous work and makeup on the face. Those with large moustaches, beards or even stubble will not be able to get an effective seal between the face and the respirator, and inhaled breath can then bypass the filter, not go through it, so they can have little or no respiratory protection. The individual wearer should be fit tested with the mask to prove it does (or does not) fit their face. This is a specified process that is required by AS/NZS 1715 and the relevant OHS regulators. There is fit testing equipment available as well as consultants who can do this testing for you.

There are several reasons why a half or full face mask may not be acceptable to an individual:

- Facial hair — the wearer has a beard or other interfering facial hair and wants to keep it.
- There is no tight-fitting mask that fits and is acceptable to the wearer.
- The potential wearer has some physical condition that is not compatible with the increased breathing resistance caused by a filtering mask eg, they have a lung issue and breathing problems and do not need an increase in breathing resistance from a respirator.
- There is a reluctance by the individual to wear a mask — eg, claustrophobia, heat issues or compatibility with other PPE.

For those individuals who cannot or will not wear a tight-fitting mask, use of a battery powered air purifying respirator (PAPR) or supplied airline respirator system, fitted with a suitable headtop like a hood or helmet can provide an alternative that can give the required protection.

A PAPR has the following benefits:

• No breathing resistance.
• Powered air delivery creates a moving flow which creates a cooling effect.
• Can be used with facial hair that does not interfere with the faceseal of the headtop.
• The headtop selected can provide multi-level protection — can include head, eye/face and/or welding protection as well as respiratory protection.

A supplied airline respirator has all of the benefits above plus:

• Does not require a filter that is suitable for all of the airborne contaminants present in the workplace air.
• High protection levels according to AS/NZS1715.
• Can use vortex heaters or coolers to 'air condition' the air coming into the headtop by ±250°C.

There can be specific circumstances where suitable filters are not available for the contaminants and an airline respirator supplying clean filtered air to a suitable headtop from a distant source can be suitable.

Maintaining the equipment

All workers using respirators should be trained in routine maintenance and storage. Disposable types are discarded when clogged, damaged or unacceptably dirty. Other respirator types are re-usable but will need regular inspection, cleaning and replacement of worn or faulty parts as required to get the expected performance and protection.

All filters have a service life — they don't last forever. Gas filters will gradually fill up with contaminants and then will no longer absorb. At this point the gas/vapour contaminant will break through the filter into the lungs. These filters need to be changed before they are full. Exactly when this needs to happen will depend on the specific circumstances — type of gas/vapours, amounts, humidity levels, filter size and type, breathing rate, etc.

Particle filters will load with the contaminant at some rate over time and thus will become harder and harder to breathe through. This restriction to breathing will eventually become too much and the particle filter should be changed. All types of filters should be changed on a regular basis according to the manufacturer's instructions and in accordance with the levels of contaminants in the workplace.

The future

An ISO Standard for Respiratory Protection is currently in development that will change the framework for design and selection of respiratory protective equipment, although this is still a number of years away. Advances in materials technology and electronics will also impact on future product designs.

3M Personal Safety
www.3M.com/au/PPESafety

> **ALL TYPES OF FILTERS SHOULD BE CHANGED ON A REGULAR BASIS ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND IN ACCORDANCE WITH THE LEVELS OF CONTAMINANTS IN THE WORKPLACE.**

NEW PRODUCTS

High-bay LED light with occupancy sensor

The Big Ass Light from Big Ass Fans is a high-bay LED featuring an occupancy sensor that maximises energy efficiency. The product is suitable for large warehouse spaces such as distribution centres.

Designed for long-term performance, the fixtures are constructed from a single piece of anodised, extruded aluminium, which acts as a heat sink and helps the fixtures reach a rated life of up to 150,000 h. The occupancy sensor is a low-profile device that offers 360° of monitoring to automatically turn the light on and off when people enter and leave the space. The turn-off timer can be programmed from floor level using a remote, while the sensor can be adjusted to dim or turn off during daylight hours if natural light is present.

The lights offer 26,000 lm, while the occupancy sensor can reduce energy consumption of the already efficient LED by an additional 30–65%.

Big Ass Fans Australia Pty Ltd

www.bigassfans.com.au

Remote-controlled belly plate jack

The Nivek Industries Tracked Elevating Device (TED) is a remote-controlled belly plate jack and mobile tool handler, specifically designed to safely and efficiently remove belly plates and undercarriage components on earthmoving and construction equipment.

With a working load limit of 800 kg and low-profile collapsed height of 315 mm to a lift height of 1170 mm, the device can safely lift, carry and move heavy components, including equaliser bars and steer cylinders, during maintenance tasks. The integral remote control interface reduces the risk of suspended load hazards and the need for personnel to place themselves near, or under, heavy components being manoeuvred and positioned. Featuring track-driven movement and steering, the product is an all-terrain machine for use in workshops and off-road locations.

The product is supplied with an adjustable dozer blade and a 360° top-mounted turntable. The blade is used to clear a safe working area under plant or equipment that is parked or broken down on rough terrain. The turntable aids in the alignment of components during removal and installation. Optional attachments include a track roller carrier, a steer cylinder cradle, a machine stand locator, a slope table, an extension block and a cutting-edge tool holder. Other accessories include an off-road trailer and storage system.

The product can also be combined with the Zero G Tool Handling System to offer workers a versatile machine and tool combination for manoeuvring heavy tools with weightless efficiency and safety.

Safety MITS Pty Ltd
www.safetymits.com

Face shield

Elliotts has released the ArcFit 14 face shield featuring a low-profile chin protector, designed to provide increased comfort and extended protection for workers, while offering a greater range of head movement, mobility and field of view.

The face shield includes dual-sided anti-scratch and anti-fog coatings for long service life and clear vision, even in extreme temperatures. It also features a 55% VLT (visible light transmission) capability.

The polycarbonate shield is specifically designed with spectral absorbers, which meet ANSI and EN166 high mass and high speed velocity test requirements as well as provide a 99.9% absorbency of harmful UV A, B and C, 180–380 nm. The product also meets the Short Circuit ARC Class 2 rating to GS-ET 29:2011-05 and 14 cal/cm² rating to ASTM F2178 for use in NFPA 70E-2015 for PPE Category 1 and 2 protection levels.

Elliott Australia Pty Ltd
www.elliottaustralia.com

Electrical safety testing system

The Megger PAT420 testing and tagging system allows for user-configurable PAT settings and data to be downloaded to USB. This gives greater flexibility and control for multifaceted electrical safety testing projects. Data can also be exported to Excel spreadsheets for further analysis.

This portable PAT system comes bundled with a barcode scanner and label printer, and the onboard storage facilitates those who choose not to export to USB. Features include: tests to AS/NZS 3760; 10 and 25 A earth bond testing; memory storage for up to 10,000 test results; and selectable pass/fail limits. TechRentals offers a set-up and download service for this product.

TechRentals
www.techrentals.com.au

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Portable roof anchor

DBI-SALA's Anchor on the Go is a cost-effective temporary roof anchor point that is suitable for residential, commercial and industrial applications. Approved to AS/NZS 5532, the anchor provides an easy-to-use, economical, temporary anchor for metal roof applications.

The device can provide a safe solution for fall protection during all aspects of roof access, maintenance, repairs or improvements on a variety of metal roofs. Its portability makes it suitable for the 'tradie' to take with them from job to job, allowing them to work confidently, efficiently and safely while complying with safety regulations.

Constructed from high-strength, corrosion-resistant materials, the anchor is designed for use on roofs constructed with metal roof sheeting in the following profiles: Custom Orb, Trimdek, Spandek and Klip-Lok 700.

The device is quick and easy to install and remove — there are no tools required, the user simply attaches the anchor in two easy steps and then connects their personal fall arrest system.

Capital Safety - a 3M company
www.capitalsafety.com.au
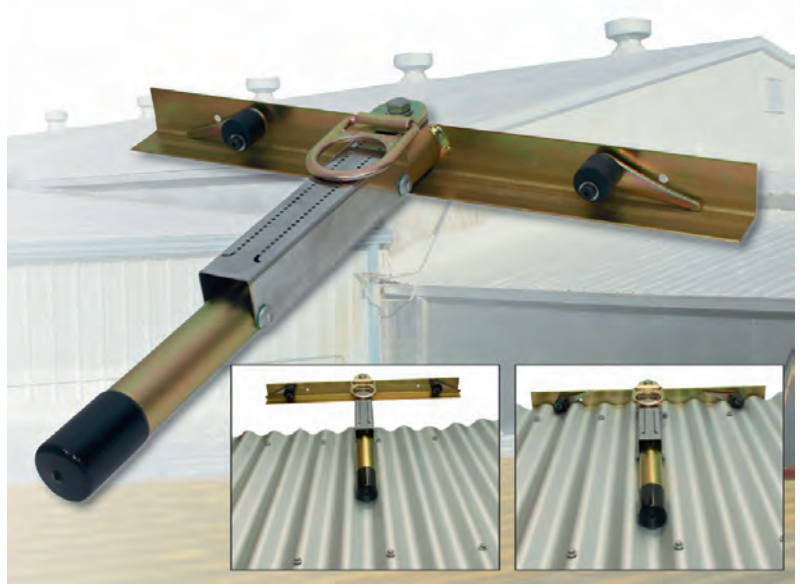
Gas detection training mobile app

Industrial Scientific has introduced the Gas Detection Made Easy app, a free training and reference tool enabling gas detection information to be made available on mobile devices. Designed by the company's training team and centred on the curriculum taught during basic and advanced courses, the app is geared towards anyone who cannot attend regular training sessions or wants to learn about gas detection techniques and technologies.

It is a suitable study tool for both beginners and more advanced personnel to reinforce in-person training or as a quick reference to refresh gas detection knowledge. It covers sensor technologies, gas hazards and gas monitoring applications, as well as current regulations governing gas detection. Key features include the ability to take notes, send notes via email, add bookmarks to view at a later time and perform keyword searches.

The app is free to download from the Google Play Store, the Apple App Store or the Industrial Scientific website.

Industrial Scientific Corporation
www.indsci.com

Instant fit custom-moulded earplugs

SonoLab Instant Fit Custom Moulded Earplugs provide users with comfortable and cost-effective hearing protection. Noise-induced hearing loss has become one of the leading industrial injury claims in Australia, and laws are tightening to protect employees. As well as hearing loss itself, loud noise can result in occupational accidents because it masks warning signs, hinders communication and diverts attention.

SonoLab Instant Fit Custom Moulded Earplugs give the same level of protection as traditional moulded plugs, but can be made and fitted quickly.

The earplugs are designed to interface seamlessly with any communications device and are available with different levels of noise filtering. Also available is a metal-detectable option for the food industry, which is coloured blue for easy identification.

SonoLab
www.sonolab.com.au

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WHOLE NEW WORLD OF SAFETY TRAINING

Laura Valic

Employers today are often faced with the challenge of training workers with low literacy skills or with English as their second language, engaging multiple generations accustomed to different teaching methods, and reaching hundreds or thousands of employees across various locations. Rather than providing text-heavy documents and expecting people to read them, digital videos, mobile apps or games offer immersive, memorable experiences while incorporating learning objectives, and at the same time, flexibility around how businesses present training.

On the whole, safety material is rather dry, perhaps even repetitive to experienced workers. Capturing the attention of workers leads to better learning outcomes, which importantly reduces business risk and can help to prevent injuries or save lives. Should you then be looking to incorporate digital technology into your safety training?

From enforcement to engagement

Research from RMIT University suggests workers in construction, more so than other industries, have less education behind them and often don't read safety documents before working on-site. Health and safety (H&S) training also usually involves an 'expert' instructor passing on knowledge to recipients, which is thought to be ineffective when applied to adult learning. This style also focuses on enforcing compliance with rules, rather than asking workers to be involved in the design of systems of work, which can bypass knowledge employees may have already gained from the tasks they perform.[1]

Helen Lingard, Professor, Construction Occupational Health and Safety at RMIT, said in an article published on *The Conversation*:

Visual methods, including video, can overcome some of these difficulties. For a long time videos have been used to communicate health and safety information to workers. But safety training videos are often produced by technical experts or media companies and shown to workers in stand-alone presentations. In such uses, workers are passive audiences to generic video materials.[2]

Melbourne-based firm CodeSafe Solutions has designed a method to meet these challenges. Workers are given basic media training and are then encouraged to script, act and record films to visually show their safety knowledge from their everyday work practices. Using Quick Response (QR) code technology, workers can then share videos with colleagues, which can be easily accessed by a smartphone or tablet. RMIT researchers evaluated the experience of several organisations that worked with CodeSafe and discovered that workers and managers, when watching back the videos, found

Technology analysts Gartner say gamification has become an essential part of digital business strategies as a way of motivating people, but most organisations aren't getting it right. Gartner defines gamification as the use of "game mechanics and experience design" to digitally engage and inspire people to achieve their goals. Further, it needs to touch people on an emotional rather than a transactional level.

"Gamification is about motivating people to achieve their own goals, not the organisation's goals," said Gartner Research Vice President Brian Burke. "The sweet spot for gamification is shared goals. If a business can identify the goals it shares with its audience or provide its audience with goals that are meaningful to them, then it can leverage gamification to motivate these players to meet those goals, and the company will achieve its business outcomes as a consequence."

Some ways to do this include presenting people with practical challenges and encouraging them as they progress through levels, thereby gaining their emotional investment. "Game mechanics and design have been used to engage and motivate people to achieve their goals throughout recorded history," said Burke. "Gamification is about rethinking motivation in a world where we are more often connected digitally than physically." Burke also says we are just at the start of this journey and gamification will continue to develop for many years to come.

Can safety be a game?

According to Justin Wight, director of Australian online content developer Monkeystack, the animation and games industry has matured and is now widely accepted in the entertainment-education space. His company recently partnered with Flinders University to produce a gaming app, involving a computerised nurse, to offer participants a better understanding around the warning signs and the best response to heart attacks. He said the app gamifies a complex issue well.

"It provides the perfect education ... and it can work hand in hand with nurses," Wight explained. Initial results showed the interactive app helped increase patient knowledge by more than 15% and symptom recognition by more than 24%.

With good design, gaming has the power to translate into real-world skills and behaviours. Walmart is a good example of this. In 2012 it piloted game-based training from Axonify for around 5000 of its logistics workers across eight distribution centres. Using three-minute games with interspersed multiple choice questions on safety procedures, the games provided repeated instructions in short intervals. This format was highly suited to Walmart's distribution centres because three minutes was the amount of time needed to recharge a forklift battery. While the battery charged, the forklift operator was encouraged to play the game. Walmart reported a 54% decrease in incidents at these centres where it was tested, and considered the pilot's success the start of its efforts to gamify worker safety.[5]

problems in standard operating procedures. Lingard said that this then resulted in several instances where equipment or processes were redesigned to improve safety.

What the researchers also found was that people responded to and engaged better with the visual, participatory nature of the videos. One worker commented: "I think it's the best way for people to learn. I mean, just from my point of view, being on a building site I don't read too much at all, especially when I get on-site. I'm here to do a job, you know what I mean?"[3] Another commented: "Yeah, it's good for everyone to throw their input in and you just learn a lot more about what could be done, and it gets your mind thinking."[4]

Gaming and training

Getting people to think and engage with a topic has often been effectively achieved through gaming. A game is usually more fun, more likely to keep a person's interest and therefore assist with learning outcomes.

Image courtesy Fraunhofer Institute for Production Technology.

> **IN A WORLD WHERE WE'RE LESS ABLE TO CONCENTRATE ON ONE OBJECT OR PIECE OF INFORMATION FOR LONG PERIODS OF TIME (DEEP ATTENTION), BUT INSTEAD QUICKLY SWITCH FOCUS BETWEEN MULTIPLE OBJECTS WITH LESS TOLERANCE FOR BOREDOM (HYPER ATTENTION), MICROLEARNING IS THOUGHT TO OVERCOME THE CHALLENGES OF TRADITIONAL LEARNING.**

Microlearning: moving from deep to hyper attention

Some, however, are less convinced 'gamification' is the answer to the modern worker and workplace training, and that a more powerful teaching methodology is 'microlearning'. According to microlearning experts Grovo, this is "the process of building successful behaviours in small, focused segments".[6] They say each microlearning intervention is built around one highly focused, self-contained learning unit, which can be in any format, such as a video, game or GIF. It involves continual performance improvement by changing behaviour bit by bit.

In a world where we're less able to concentrate on one object or piece of information for long periods of time (deep attention), but instead quickly switch focus between multiple objects with less tolerance for boredom (hyper attention), microlearning is thought to overcome the challenges of traditional learning. It offers chunks of information in shorter time periods, ie, 3–7 minutes, thereby matching the brain's working memory and attention span. This is also beneficial for busy workers who are reluctant or less able to complete hours of training at a time, and more cost-effective for businesses.[7]

Training on your head

Digitally connecting workers in a new way — literally straight onto their head this time — is the institute for production technology, Fraunhofer IPT. The institute's software solution 'oculavis', which integrates smart devices within the production process, was taken up by Hungarian company Robert Bosch Elektronika Kft. to train new staff in assembly line procedures.

'Smart glasses', which comprise a camera for recording videos and images, allow workers to quickly visualise each step in an operation right in front of them — without a clunky manual. The glasses are particularly useful for complex work sequences and can also link staff with video telephony to receive direct instructions or to production machines via OPC-UA. Fraunhofer said the smart glasses can also enable new, untrained employees to learn and work independently straight away, while experienced staff who may be liable to make mistakes when there is a change of model can benefit from the personal imaging system. Researchers at the institute believe it soon will no longer be necessary to painstakingly document suggestions for product or process improvements in writing, as it can now be recorded clearly on the spot via photo, video and speech recording.

Digital technologies can therefore clearly offer businesses numerous possibilities for improving staff engagement and learning beyond the written document. Those incorporating digital learning into their H&S training are reporting on improved safety gains, offering a strong argument to move on from passive training towards immersive, short experiences. The challenge will be finding a solution that best suits a business's budget, workforce and educational requirements.

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Driver safety camera

The CamtrackerLIVE 3G driver safety camera includes live GPS tracking technology, real-time event data recording and onboard diagnostics (OBD) in one fully integrated device.

Designed for monitoring and optimising driver behaviour for safety and efficiency, the telematics device can be fitted into a vehicle or fleet of vehicles. It is used to record data about driver habits, speed notifications and harsh manoeuvres. Detailed driver reports can be supported with HD video footage and this can provide a clear roadmap that highlights areas for improvement as well as ways to reduce the risk of accidents.

The real-time, event-data recording provides insight for fleet owners. Harsh manoeuvre events are recorded from the camera and sent in real time directly to the owner of the vehicle or fleet, enabling them to view incidents on a computer and/or mobile device.

The OBD help monitor parameters of the vehicle that the driver controls such as fuel efficiency, out-of-gear coasting and load weight. These can all be assessed and the information can be used to encourage correct driving patterns.

FleetSeek
www.fleetseek.com.au

Training app on respiratory protection equipment

Safety Equipment Australia continues to expand its multimedia training programs on personal breathing protection. The resources are suitable for both training sessions and self-study, and come in a variety of forms, including handouts, posters, animated PowerPoint presentations, videos and YouTube clips.

The e-training programs are said to be popular with instructors and end users alike. Designed for rapid learning, each training module is as effective in print, on a computer or tablet, or on a smartphone. The smartphone app is particularly useful for individual study as the training modules can be called up at any time, even in places without Wi-Fi.

The training program covers most Sundström respiratory protection devices: half masks, full face masks, powered fans, filters, supplied-air equipment and more. Each product features an 'About…' module and a 'How-to…' module with detailed demonstrations of function, assembly, cleaning, maintenance and storage.

A recent addition to the program includes training on the new SR900 modular respirator system, showing all the possible connections directly to filters, to remote filter holders, fan units and supplied air.

The training resources, available from the S.E.A. website, are free for anyone to use and can easily be incorporated into existing material or used as standalone modules. Safety Equipment Australia can also provide its own representatives to conduct training on-site.

Safety Equipment Australia Pty Ltd
www.sea.com.au

Safety interlock switches

The NG series RFID-enabled safety interlock switches offer protection ratings of IP67 and IP69K with a locking force of 7500 N. The system can hold unlocked doors in position with a force of approximately 30 N and can prevent the door from being opened by vibrations or gusts of wind. They are best suited to washdown environments where particular attention is required for cleanliness and hygiene, such as in the chemical or marine industries.

The series safety interlock switches have the choice of two different activation modes for the safety outputs: Mode 1 (active with guard closed and locked for machines with inertia) and Mode 2 (active with guard closed and unlocked for machines without inertia).

The digitally coded actuators are suitable for use in safety applications up to SIL3/PLe, with a single device for each protection. Versions are available with a lock device, an emergency release push-button or both.

Leuze electronic Pty Ltd
www.leuze.com.au

Mobile game app warns of heart disease

A new and innovative mobile app is being developed to encourage a better understanding of the warning signs and appropriate response to heart attacks, targeted at all audiences — including older and migrant groups, and people with low literacy.

The Flinders University School of Nursing and Midwifery 'game', to be accessible on mobile devices such as smartphones and tablets, is designed to improve potential patients' knowledge and responses to acute heart disease symptoms (eg, arm and chest pain, nausea or shortness of breath) through a series of easy-to-follow instructions.

The avatar-based app using a computerised 'nurse' called Cora, developed by SA animation studio Monkeystack, is an example of the 'gamification' of healthcare education to more effectively teach people about what to look for and what actions to take in the event of a heart attack. The app was developed in response to numerous studies that show how information technology plays an important role in improving patients' knowledge and self-management ability.

According to Flinders University Professor Robyn Clark, more community awareness is needed about cardiovascular disease — the single largest killer of Australians — especially since heart attack patients can have up to a 50% chance of experiencing a second event.

"Retention of information is far greater with an interactive app than with a printed brochure, and by using the app we hope to improve knowledge, responses and ultimately save lives," said Professor Clark.

"As well, this app paves the way to an exciting future where we can provide ever more flexible and effective ways to deliver essential education to our patients, including the reported 47% of Australians suffering from functional illiteracy. We are also working on other creative ways to communicate more successfully with people from Indigenous and migrant groups in Australia."

Following a successful pilot, the app is now being tested in clinical trials at the Flinders Medical Centre with a full rollout planned for 2017.

A six-month trial in 2015 resulted in the majority of participants reporting a high level of satisfaction with the app (87.3%), saying it taught them how to recognise and respond to symptoms of heart attack. Their knowledge increased by more than 15% and symptom recognition increased by over 24%.

The app is designed in such a way as to suit every generation, including the elderly, so they can easily follow and interpret the information.

Flinders University
www.flinders.edu.au

PROTECT YOUR BODY IN A FLASH

A new report released by Hard Yakka reveals many worksite injuries resulting from arc flash occur due to insufficient protective clothing.

A number of companies manufacture clothing suits and other PPE to shield workers from arc flash events. Its importance no doubt lies in the fact that arc flashes represent a serious risk to people and equipment. When an arc flash occurs during a fault or short circuit condition temperatures can reach up to 20,000°C, which is hotter than the surface of the sun. This kind of temperature can set fire to clothing and severely burn skin in seconds, even from long distances, or blow up nearby combustibles sending dangerous shrapnel flying.[1] As a result, protective clothing has been legislated across a number of industries under AS/NZS 4836:2011, though the extent to which industry adheres to flame-resistant (FR) clothing guidelines has remained unclear.

A report, however, has now been released by Hard Yakka PRO-TECT, conducted by Symphony Research in November last year, which provides insights into the uses, users and perceptions of FR clothing across Australian industries. If you or your workers operate in fields exposed to arc flash and flash fire events, then read on. The results of the report may surprise or even concern you.

Uses and perceptions

The report revealed that of the 500 people working in industries exposed to arc flash and flash fire events such as oil and gas, electrical, energy, transport and mining, over a quarter (28%) do not wear FR clothing for work. FR clothing is essentially made from material that will extinguish flame after ignition and won't continue to burn, ie, aramid fibres. The main reasons why people surveyed in the report did not wear FR clothing included: their workplace does not make provision (38%); it is too expensive (16%); the clothing is too uncomfortable (14%); or the clothing is considered too hot to wear (12%).

When looking at the survey results, Hard Yakka FR Product Manager Brad Shefelbine said the figures were confronting.

"While the research was conducted to better understand industries' understanding of flame-resistant clothing, it's alarming to see the significant number of people who don't sufficiently protect themselves when at work; and subsequently, the injuries they're exposing themselves to," said Shefelbine.

Of the two-thirds from the report who do wear FR clothing, their reasons for doing so included: they believe safety is paramount (75%); it is industry regulation (59%); and they are required to do so by company policy (48%).

Injuries

Data from the US Bureau of Labor Statistics (BLS) indicates that there were nearly 6000 fatal electrical injuries to workers in the US between 1992 and 2013. BLS data also reveals that there were 24,100 non-fatal electrical injuries from 2003–2012, the most recent

Image courtesy of Hard Yakka

to take a day off work (19 vs 5%), and they were also more likely not to seek medical care (21 vs 16%).

Standards to live by

Perhaps another interesting revelation from the report was the general lack of knowledge over what clothing fibres constituted as flame resistant. 63% commented that they did not know, while a quarter mistakenly believe cotton would do the trick. While it is said workers can wear cotton underwear[4], that's as far as it goes — FR shirts and pants should be worn over the top.

The table below is based on table 9.1 from AS/NZS 4836:2011 and shows several arc flash requirements for PPE in an easy-to-understand format.

PPE	Requirements to AS/NZS 4836:2011	Clarification
Arc flash suit and hood	Certified to 40 cam/cm²	Tested to 40 cal
Insulating gloves	AS2225 or Equivalent, rated to appropriate voltage, air tested before use	IEC, ASTM and EN gloves acceptable
Flame-resistant (FR) gloves	Gloves made from leather or other non-melting heat-resistance material	Complying with AS/NZS2161.4
Protective clothing	Flame-resistant, full body clothing with no metal	Cotton not suitable. Must be FR rated and tested fabric

Products for the above requirements are readily available from safety companies such as Hard Yakka, which has recently launched its ShieldTEC protective garment range.

"Uniquely in Australia, and perhaps the world, Hard Yakka ShieldTEC garments are fully certified to European ISO (ISO 11612) and USA NFPA (NFPA 2112) standards and further tested and compliant to both NFPA 70E and the Australian ENA NENS09 guidelines," said Shefelbine.

"Our new ShieldTEC FR range is the most tenacious yet — delivering superior comfort and innovation while ensuring safety in an arc flash or flash fire event.

"This combination of superior protection, comfort and breathability is what makes Hard Yakka ShieldTEC FR stand apart."

Hard Yakka
www.hardyakka.com.au

10-year period for which data is available.[2] The report Occupational injuries from electrical shock and arc flash events, released by the National Fire Protection Association, states that "work inappropriately performed on energised equipment is associated with a substantial share of electrical injuries" while "insufficient training for working on or around energised electrical equipment" and a "failure to use appropriate personal protective equipment for electrical safety work practices" are contributing factors in many electrical injuries.[3]

Safety Solutions does not have access to equivalent Australian statistical data; however, failing to don protective gear, a lack of knowledge and understanding around suitable PPE as well as a lack of training are also presumably contributing factors behind reported on-site injuries in Australian industry. Around 46% of those surveyed in the report said they had experienced an injury and required time off work due to arc flash (nearly half) and 56% admitted to having experienced a near miss. The most common injuries included serious burns (21% experienced third-degree and 16% second-degree), while one in 10 reported respiratory system damage as a result of injuries sustained by not wearing FR clothing on the job.

From the report's findings, nearly half of those injured were serious enough to have to take more than one week off work to recover and 17% received medical bills in excess of $10,000. Those who were wearing FR clothing at point of injury were more likely to not have

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[1] Cameron G. Clark, GE Industrial, 'The Basics of Arc Flash', viewed on 17 May 2016, ⟨www.geindustrial.com/sites/geis/files/gallery/The-Basics-of-Arc-Flash-Article_GE_Industrial_Solutions_0.pdf⟩.
[2] Richard B. Campbell and David A. Dini, March 2015, Fire Protection Research Foundation, 'Occupational injuries from electrical shock and arc flash events', viewed on 17 May 2015, p. iv, ⟨www.nfpa.org/~/media/files/research/research-foundation/research-foundation-reports/electrical/rfarcflashoccdata.pdf?la=en⟩.
[3] Ibid, pp. iv–v.
[4] Cameron G. Clark, GE Industrial, 'The Basics of Arc Flash', viewed on 17 May 2016, ⟨www.geindustrial.com/sites/geis/files/gallery/The-Basics-of-Arc-Flash-Article_GE_Industrial_Solutions_0.pdf⟩.

KEEPING HOT HANDS
COOL, DRY and PRODUCTIVE

THE WORLD'S FIRST GLOVE WITH ATG®'S INTEGRATED **ANTI-PERSPIRANT**[1]

ATG®'s technology is being continuously developed by a core team that matches market research and marketing analysis with the latest technological developments. This forms the foundation upon which we continually improve the customer experience through constant innovation.

One recurring demand arises in each and every conversation we have, comfort. Today 97 per cent of glove wearers claim that comfort is their number one priority when choosing gloves with the key challenge being **sweaty hands**.

Why?

The skin, the largest organ of our body, is used to regulate its temperature through perspiration (thermoregulation).

On average, our skin contains 155 sweat glands per square centimeter; however, **our hands have 83 per cent more sweat glands per square centimeter than the rest of our body.** The back of our hands contains 200 sweat glands per square centimeter whilst on the palms of our hands there are 370 per square centimeter.

Combine this with a gloved hand and it explains why sweaty hands remains an age-old problem.

Time for change?
We at ATG® think so.

AD-APT® is available as
MaxiFlex® Ultimate™ 42-874

Image shows MaxiFlex® Ultimate™ 42-874
Patent Nr. EP1608808
[1]precision handling glove with breathable nitrile coating

Find out more: **www.atg-glovesolutions.com**

Thermal imaging clamp meter

FLIR has released what is claimed to be the world's first thermal imaging clamp meter, the CM174 Imaging Clamp Meter with IGM (Infrared Guided Measurement).

The CM174 600A AC/DC clamp meter has a built-in thermal camera that powers FLIR's IGM technology, which visually guides users to temperature differences and pinpoints anomalies. Electricians may even find new issues they didn't expect to see, expanding their scope of work. For instance, they might have a hunch that a faulty motor controller caused an equipment failure, but after using the device they discover that an overheating motor or a loose connection was to blame.

If an electrician is facing cluttered wires or scanning complex panels for hazards, they can stay at a safe distance and use IGM to show them the anomalies without reaching into the panel. The narrow-jaw design and built-in work lights make it easier to clamp the meter around wires in tight spaces and in poor lighting conditions. The product validates findings with advanced measurement features to help solve the most complex electrical issues and is useful for checking repairs and ensuring problem areas have returned to normal.

FLIR Systems Australia Pty Ltd
www.flir.com.au

Certified load-rated blocks to improve jacking safety

Cribbing and Matting Co's working load limit-certified dura crib and dura stat jacking and blocking products are designed to improve safety when stabilising machines in industrial environments, including heavy vehicles or plant equipment.

Unlike timber that traditionally have been used for jacking and blocking, the fit-for-purpose stabilisation tools are made using a controlled, repeatable formula to strict production and quality processes, ensuring consistent performance under load-bearing situations. A pyramid and notch surface provides positive interlocking of the blocks when used in stacks, reducing the possibility of the supported load slipping.

Manufactured from recycled high-density polyethylene (HDPE), the products are not only good for the environment but also robust and come with an extended performance life. The range is also resistant to fuels, oils and most common industrial chemicals, it is non-conductive and it will not split, splinter or rot. The jacking and blocking products are tested to AS2498 and AS1170 with certified working load limits of up to 110,000 kg for a single 160 x 300 x 600 mm block.

Cribbing and Matting Co Pty Ltd
www.cribandmatco.com.au

Forklift anti-slip mats and tyne caps

The GenieGrips range of forklift anti-slip mats and tyne caps offers a safe way to transport goods by forklift using high-strength rubber compounds to protect against damage and scrapes, while also offering good grip to secure loads.

Even when a forklift is travelling at a reduced speed it presents significant risks to pedestrians, while a forklift carrying an unstable or slippery load can become unbalanced and endanger drivers and passersby in the event of it tipping or overturning. The anti-slip rubber mats which fit onto forklift tynes therefore help improve safety while transporting goods in industrial workplaces as the protectors prevent merchandise from sliding. The rubber compound can also be adapted to suit specific environments; for example, using Viton for high temperatures or EPDM for exposure to large amounts of UV.

The forklift tyne cap by comparison sits on the tip, rather than covering the entire tyne, preventing the metal tyne from causing damage to merchandise during lifting. Simple to fit and remove, the caps are constructed from high-visibility yellow compound rubber, which means they can be safely seen during the day or night. They also feature a reinforced steel frame for longevity.

The products are manufactured in Australia to ISO 9001 standards.

GenieGrips Pty Ltd
www.geniegrips.com

FIVE REASONS TO DITCH PAPER
WHEN MANAGING OHS COMPLIANCE

Christopher Notley-Smith, Donesafe

Are you bogged down with paperwork while trying to manage your OHS compliance? Here are five reasons why you should ditch paper and move to a software solution.

It's not at all uncommon for business owners or managers to feel that OHS compliance management has become a major part of their week. The issue with this particular part of their week is that it brings with it a massive and seemingly unnecessary financial and time drain. If you find yourself in this group, then there's a very good chance it's easy to guess why: you still manage your OHS compliance on paper.

But don't worry, you're not alone. Plenty of companies still use paper systems to oversee their OHS compliance management. You'd be shocked by the scale of these operations. While they're shooting thousands of emails back and forth at lightning speed, they're still using little carbon copy pads to manage the literal safety and wellbeing of their staff.

Here are the top five reasons why you should ditch paper altogether and move to a software solution.

1. Save money

Paper is not cheap. If you ignore the time involved in managing a complicated system on paper, even then, the actual price of managing the system in this way is staggeringly high compared to many of the software options out there. Though software platforms vary greatly in price, there have been instances where major companies, when switching from paper to software, were able to save as much as two-thirds of their OHS management costs.

2. Save time

Some business owners in the SME (small to medium-sized enterprise) space admit to spending nearly a day a week managing their OHS compliance. OHS management covers:

- injuries and claims;
- health, hygiene, hazards, incidents, ergonomics and environment;
- risks, audits and compliance;
- contractor and visitor management;
- training, education and licence management;
- emergency management;
- plant, equipment and chemical registers;
- and the list goes on.

When you consider that all of these items come with some fairly strict compliance attached to them, really, a day a week starts to sound feeble.

To put it simply, when you actually look at the list, managing this portfolio on paper seems, dare I say, insane. Some software platforms can manage every one of these areas, creating records and workflows automatically in a 10th of the time.

3. Make work easier

Picture this. A worker notices an exposed cable in a high-traffic area. S/he pulls their phone out of their pocket, opens the safety app, snaps a photo, taps a few times on the screen and puts their phone away. Done. That worker can get back to work, but their simple action launches a workflow.

Somewhere else a manager receives a notification of the hazard and can manage the hazard from wherever they are. S/he too, taps a few times on their screen and the software gets back to work and notifies those in a position to resolve the hazard quickly and easily: no paperwork, no phone calls. Using software to manage your OHS turns this otherwise arduous task into something easy and, almost, fun.

4. Make workplaces safer

In the above example, a worker noticed and took action on a potentially dangerous hazard on the spot without it affecting their daily routine. Without a quick and easy way to resolve potential issues like this, these types of hazards can go unreported indefinitely, or at least until somebody in a position to rectify the issue notices it first-hand. Using a software solution shares the responsibility of creating a safer workplace between all workers. This gives the owner or OHS manager potentially thousands of eyes on the ground rather than just their two.

5. Make workplaces smarter

Although it may be possible to manage a complex OHS system on paper (be it more expensive, slower, harder and less safe), one thing you absolutely DON'T get is safety intelligence. Safety software has the ability to compile all of your otherwise disconnected pieces of information and provide real business intelligence. If there is an increase in incidents, you'll be able to identify and resolve it quicker (while automatically reporting it). If an employee's licence expires, you'll know about it weeks before it happens. Automated management like this is what keeps you protected.

Safety software not only protects your workers, but as business owners or OHS managers it protects your business. With OHS-related business fines up to $3m and personal fines up to $600K (potentially with jail time included), managing your safety smartly is more than just a moral issue; it's a serious legal one.

So whether you're in the position where you feel that OHS compliance is so difficult to manage that it's hurting your business, or if you'd like to shave a significant amount off your OHS management costs, it's time to make the switch.

6. Bonus reason

And as a bonus for not using paper — at the very least you'll save a tree.

Donesafe is an end-to-end OHS safety software system that is cloud based, jargon-free and works seamlessly on any device with a browser. To learn more about Donesafe, visit www.donesafe.com.

Donesafe Pty Ltd
www.donesafe.com

NEW PRODUCTS

Weightless tool handler

The Equipois Zero G Tool Handler allows workers to manoeuvre heavy tools with weightless efficiency and safety. It is suitable for a diverse range of industries, including mining, construction, aerospace, automotive and defence.

In every Zero G system, the gravity-balancing arm technology aids in reducing fatigue, therefore protecting workers from injury and increasing productivity. Worker overexertion and repetitive stress is lessened as the system allows for heavy tools to be guided, rather than lifted.

Incorporating a modular design of components with spring dynamics to balance the weight of heavy tools used in, for example, bolt tensioning, drilling, sanding and riveting, the product's arms can hold payloads of up to 19 and 38 kg respectively in a fully balanced weight outcome. This allows the user to safely manoeuvre the tool load in any direction.

The product is available in stand-alone trolley-mounted systems, gantries, jib arms, linear rail or mounted to a remote-controlled tool handler system. It also requires little maintenance and no inputs such as electricity or compressed air.

Safety MITS Pty Ltd
www.safetymits.com

Remote condition monitoring service for drive events

The ABB customisable drives Remote Condition Monitoring service is designed to help in maintenance planning and improve risk management.

The service, enabled by the Internet of Things, Services and People (IoTSP), can deliver real-time information about drive events and help to predict maintenance needs, operational risks and possible system faults. It will allow equipment to perform better and last longer, keeping production running as planned.

The service can help in predictive maintenance planning by using remote data. It includes an analysis report on the drive's condition and proactive email alerts regarding potential faults or limited availability, ensuring that equipment is available, reliable and maintainable.

For industries where equipment downtime is costly, solutions are needed to assess future risks. Since drive performance data is readily available, making use of this information to find out how equipment operates and why it could fail can let users maximise drive performance. ABB's Remote Condition Monitoring goes a step further by using remote data to identify early signs of possible system failures or production problems. For example, the service can spot overheating, which could cause unplanned production breaks and eventually damage the drive. It can also prevent some semiconductor faults.

After the monitoring need has been assessed, an ABB expert will discuss the set-up that is most relevant to the user's objectives. Services can be tailored to meet specific needs.

Once a personal account has been created on the myABB Customer Portal, users will be able to monitor live data such as availability, condition, operating parameters and fault events on their laptops, desktops and mobile devices. Customised performance reports with clear charts and graphs can also be generated.

ABB Australia Pty Ltd
www.abbaustralia.com.au

Mobile safety training anywhere, anytime for celebrity chef

Generating the ultimate gourmet burger for celebrity chef Neil Perry and his fellow Rockpool directors is all about the meat; however, providing safety training to staff for their new Burger Project stores presented another beefy challenge.

They needed to reach employees across multiple stores in New South Wales and Victoria with varied work hours in order to provide crucial food hygiene and kitchen safety training. The team therefore turned to REFFIND, which offered a mobile platform that could be used anywhere and at any time. Another notable advantage was its design, which they thought would appeal to the large percentage of millennials in their workforce. Keeping employees interested during training sessions is essential for their learning and comprehension, especially when communicating important safety information.

Image courtesy of insatiablemunch under CC-BY 2.0.

Using the REFFIND Educate platform, the Burger Project team can distribute short-form training videos on basic food-handling skills, workplace safety, manual handling practices, customer service, training and supervising. The objective of the platform is to provide organisations with high levels of staff engagement, training and improved safety practices in a way that is fun and accessible. New hires conduct their initial training via their smartphone and will be prompted to complete a follow-up survey to ensure they understand key training messages.

According to REFFIND Educate, its versatility means it can be used for a number of industries. For example, the platform can deliver training on heavy lifting and stock rotation in a manufacturing environment; provide changes to company policies or compliance requirements; or new product information. Because it's accessible from a mobile or tablet, the apps can facilitate the delivery of consistent training to staff working in a variety of locations, while data captured can reveal the level of staff engagement. The platform can also ensure a safer work environment by helping to address staff misunderstandings and flagging potential issues in real time.

The company said: "Employers are better equipped to address safety concerns that arise and communicate key challenges with their staff in a quick and engaging format. Given the high demands on employees to be quick, informed and capable, micro learning is a tool employers should be utilising to help employees learn quicker and feel more confident in their roles."

REFFIND
www.reffind.com

NEW PRODUCTS

Machine maintenance voice recognition application

Honeywell has launched its Vocollect Voice Maintenance & Inspection (M7I) Solution, a voice control application designed for maintenance operations in the aviation industry.

The product supports the engine product line repair and overhaul process by allowing workers to remain mobile while giving voice instructions and collecting data for induction engines. The technology is designed to cut down on outdated back and forth data entry and look-up time on a laptop, handheld device or paper forms. It lets maintenance personnel speak commands and verbally input data findings directly into the system via a headset with a microphone. By using voice recognition, users are able to continue their work uninterrupted, increasing the efficiency of operations.

The voice control solution can also support component MRO, line and heavy maintenance for industry.

Honeywell Sensing and Control
sensing.honeywell.com

HMI operator panels with ABS approval for maritime applications

Control Logic has announced that the Red Lion Graphite Human Machine Interface (HMI) operator panels have been tested to meet ABS (American Bureau of Shipping) standards. ABS approval assures equipment is safe for operation in a manner that protects life, property and the marine environment when used in shipboard and offshore settings.

The modular HMIs have been ABS tested and approved to monitor and control equipment in maritime applications that range from work boats to offshore energy and gas vessels. In these marine environments, Graphite HMIs provide functionality that helps drive operational efficiencies as well as adhere to international standards for environmental performance.

In addition to ABS approval, the HMIs are Underwriters Laboratories (UL) Class I, Division 2 listed for hazardous locations and ATEX and IECEx zone 2/22 approved for potentially explosive environments. With rugged aluminium construction, a wide operating temperature range and flexible plug-in modules, the HMIs enable users to connect, monitor and control processes in various industries to meet industrial automation requirements in both factory and extreme locations.

Control Logic Pty Ltd
www.control-logic.com.au

MANAGING NON-NEGATIVE RESULTS

WHEN WORKPLACE DRUG TESTING

When managing an in-house testing program, minimising the distress that an alternate result can elicit relies on adequate education and training to ensure staff are able to handle the situation as required by law and to provide the appropriate levels of support as needed.

Under the standards that guide workplace drug and alcohol testing, results are defined as one of the following three testing outcomes:
1. **Negative.** This means a result below the nominated level used for initial screening/testing.
2. **Non-negative.** This is an initial positive result obtained by an accredited tester using a screening device. This screening result is then subject to confirmatory testing by an external accredited testing laboratory.
3. **Positive.** This is where a non-negative screening result has been subsequently confirmed positive by an external accredited testing laboratory.

Legislation requires that testing is only carried out by fully trained accredited staff (technicians) and it is also vital that they are adequately trained in the use and handling of testing devices, as well as recording and reporting subsequent results, in order to eliminate the likelihood of false readings or any miscommunication.

Australian Standards defines a technician as "a person who conducts on-site testing" and goes on to stipulate that "this person has successfully completed a course of instruction in compliance with this Standard (AS4760:2006) for on-site testing and received a statement of attainment in accordance with the Australian Quality Training Framework".

This highlights the importance of maintaining the program and ensuring that testing personnel are accredited, as required by law. In addition to legal requirements, every employee associated with the testing process should be armed with the information necessary to carry out the duties of their role, including being familiar with the processes generated by a non-negative test result.

In any workplace drug and alcohol testing regime, the best possible outcome is for all tested employees to return a negative result. Unfortunately this is not always the case, so it's important to be prepared for any eventuality.

Clearly define and communicate

Aside from the requirement for confirmatory testing carried out by an accredited third party, a non-negative screening result will trigger a series of company-specific events as determined by your published drug and alcohol testing policy document, which should be readily available to all employees. Education, training and communication are all important in ensuring that the process flows smoothly.

A company's drug and alcohol policy is an integral part of the overall human resources (HR) policy, so the intent of the business when it comes to managing non-negative test screening results must be made very clear to all staff prior to any testing taking place.

For instance, a non-negative result will usually require an immediate suspension of duties for the tested individual, as their fitness for duty is in question pending confirmation of a positive (or negative) result. Employees undergoing testing must be aware that this is a potential outcome and what other measures will be taken.

At a minimum, the information regarding non-negative results provided in the policy document should include:
- how a non-negative result is defined;
- an explanation of the requirement for additional and/or confirmatory testing and how it will be conducted;
- the time frame in which confirmatory testing will occur;
- what is expected of the individual in the interim — for example, will transport be arranged for them to return home until they are fit for duty, or will they be relieved of duties and remain on work premises?
- how non-working hours resulting from suspension will be treated in terms of wages (in the event of either confirmed positive or negative results);
- an explanation of what will follow in the event of a confirmed positive result — what will happen to the individual and what will be communicated to the wider workplace.

Confirmatory testing

AS 4760-2006 governs the procedures for specimen collection and the detection and quantitation of drugs in oral fluid. This includes the requirement for confirmatory testing in the event of a non-negative result from an on-site testing procedure.

According to the standard, a confirmatory test is defined as "an analytical procedure that uses mass spectrometry to identify and quantify unequivocally a specific drug or metabolite".

While saliva-based testing devices offer exceptional rates of accuracy (greater than 95%), the use of confirmatory testing by an authorised lab or third party provides a safeguard against false-positive results for both the employer and the tested individual.

Positive outcomes

In incidences where an employee returns a confirmed positive result, it is important that any subsequent actions arising from this outcome are clearly defined and communicated prior to the event.

The next steps will depend on your company's chosen response, so decisions will need to be made in advance of program deployment.

Some considerations include:
- Will your organisation adhere to a zero-tolerance policy, where the return of a positive result instigates immediate termination of employment?

> A COMPANY'S DRUG AND ALCOHOL POLICY IS AN INTEGRAL PART OF THE OVERALL HUMAN RESOURCES (HR) POLICY, SO THE INTENT OF THE BUSINESS WHEN IT COMES TO MANAGING NON-NEGATIVE TEST SCREENING RESULTS MUST BE MADE VERY CLEAR TO ALL STAFF PRIOR TO ANY TESTING TAKING PLACE.

- Will you adopt a less stringent policy via the implementation of a three-strikes approach or similar?
- Are there recognised degrees of severity based on the level of a substance detected and will these attract differing subsequent courses of action?
- Will you make information on drug and alcohol counselling services available to affected individuals? Will this apply to both terminated and temporarily sidelined workers?
- How will you manage and communicate positive test results within the wider workforce? You will need to ensure that individual privacy is adequately handled, but questions will arise from termination of employment and temporary stand-downs, so you'll need to be armed and ready.

Regardless of the policy in place and its guiding parameters, all employees must be aware of potential outcomes, including suspension or dismissal from employment — again, this should be clearly outlined in the drug and alcohol policy document. Accredited testing staff should be well-versed in the process for dealing with positive results at the time of testing in order to minimise disruption or confusion.

Provision of counselling and assistance

In many cases, it is appropriate to offer the individual drug and alcohol counselling if they are found to be using prohibited substances in the workplace. The capacity for providing this type of assistance will be driven by available resources — in the case of larger companies, counselling services are often provided in-house or by arrangement with third-party services and paid for by the company. This is less common in the case of small to medium-sized enterprises, whereby provision of information on available assistance alternatives and counselling programs should be provided as a minimum.

A number of counselling services are available that aim at to support those with substance abuse issues, investigate options for help and develop alternate coping strategies. Many offer telephone support lines or online chat services for direct response. Some of the available national services follow, but check for state-based services as well:

- Lifeline — a resource that aims to put callers in touch with the most appropriate service for their needs. It is available 24 hours a day, seven days a week. Call 13 11 14 or visit www.lifeline.org.au
- Counselling Online — a free 24/7 confidential drug and alcohol counselling and referral line. Call 1800 888 236 or visit www.counsellingonline.org.au
- Australian Drug Foundation — a national foundation that provides information on localised support and counselling services. Visit www.druginfo.adf.org.au

While the overall objective of drug and alcohol testing programs in the workplace is to provide a safe working environment for all employees, it may be prudent to consider why instances of workplace drug use occur, particularly when patterns of usage emerge.

For example, some studies suggest a link between workplace amphetamine use and performance requirements. If an individual feels pressured by time-sensitive tasks, they may see drug use as an enabler to achieving their goals, so a review of current performance indicators and expectations may alleviate problems.

Just as no two individuals are alike, there is no one-size-fits-all solution to tackling the issue of workplace drug and alcohol use. Companies with the most successful testing programs focus on education, training and communication above all else, ensuring that the process remains as smooth as possible and that employees are delivered the safe work environment to which they are entitled.

Pathtech Pty Ltd
www.pathtech.com.au

Worker emergency identification

The Vital ID Worker Safety Identification (WSID) range is used to store vital information about a worker that can be used in an emergency situation. Adhering to a hard hat or high-vis jacket, the WSID-02 device is made from 3M reflective material that can be seen in low-light conditions. The device allows site supervisors to easily and quickly identify a worker at all times, which is particularly important in the event of an accident or medical incident.

The device can store small amounts of relevant information about a worker such as full name, supervisor's contact details, family contact details and any significant underlying medical conditions and information that could help paramedics. The outer sleeve is designed to be resistant to the ingress of water and the synthetic paper ID tag inside is 100% waterproof.

Designed as a low-cost solution to support the risk management of workers, the range is available in a variety of models such as the WSID-05 Universal Fit model that can be fitted to boots, shoes, harnesses, belts, backpacks, etc.

Safety Headquarters Pty Ltd
www.safetyid.com.au

ACHIEVING SAFE
MOTION
CONTROL

In today's industrial environments, machine and plant operators are faced with a challenging task: creating flexible production workflows with a high level of automation while at the same time ensuring that people, machines and plants stay protected. The way in which interactions between humans and machines are shaped is set to have a significant effect on performance and productivity in tomorrow's industrial environments.

Innovative safety technology concepts designed by SICK for safe monitoring of drives and machine motions, such as the Safe Motion Control, make it possible to monitor the movement of a machine at any time, helping ensure that interaction between machines and their operators remains safe. By safely monitoring the machine parameters of speed, travel and acceleration, it is possible to draw an exact distinction between the machine movements which are dangerous and those which are safe. According to SICK, this also makes it possible to increase the availability and efficiency of machines while offering a high degree of safety.

All the signals from the safety sensors and actuators can be combined, generating information that indicates whether a machine operator is actually in danger when he or she enters or creates an interruption in a hazardous area. This means that it may be possible for operators to intervene in the machine even while the process is running — preventing interruptions, minimising downtimes and unintended shutdowns, cutting down cycle times, and boosting efficiency and availability in machines and plants.

Safe motion monitoring — external and integrated safety concepts

Safe drive and motion monitoring is based on the safety or control concept being used. Advantages of an external safety concept include:

- good protection against manipulation due to separation of safety and automation tools;
- independence from the drive system;
- entire safety solution in one piece of software;
- monitoring of multiple drives in a single system;
- verified and industry-specific application packages, cutting down on engineering work.

According to SICK, drives and axes that are integrated into safety functions should be equipped with certified safety encoders such as the DFS60S Pro. The requirements presented by mobile and stationary applications, and the complexity inherent in safety technology evaluations, indicate that using this kind of technology brings many benefits.

Other motion control sensors

If motors with HIPERFACE technology are being used, the safe Drive Monitor FX3-MOC0 module uses the signal from a HIPERFACE drive for electrically driven axes (eg, in the case of SRS/SRM50, EFS/EFM50 and SKS/SKM36 safe motor feedback systems). This ensures that the necessary shutdown functions are provided and that the required performance level (PL r) is achieved — with a second independent signal (eg, from an encoder) also involved if necessary.

Motion control safety controllers

Flexi Soft and the Drive Monitor FX3-MOC0 can be used to monitor both electrically and hydraulically driven machines. In the event of an

helps machine manufacturers and system integrators save time during not only system engineering, but approval procedures too. What is more, it keeps technical and legal risks to a minimum, such as those associated with self-evaluation of solutions using non-safety-certified standard products. The Drive Monitor FX3-MOC0 expansion module developed for the Flexi Soft safety controller reliably captures the direction of travel and speed parameters of the AGV, as well as providing all the most commonly used interfaces for encoders. Encoders can be connected to the Drive Monitor FX3-MOC0 at a central point and used for monitoring the direction of travel, the speed or even the brake ramp. This monitoring feature opens up the possibility of optimising the protective fields associated with the safety laser scanner attached to the AGV — and the space available for movements to take place can be used more efficiently as a result.

DFS60S Pro safety encoder — safe monitoring with just one encoder

The DFS60S Pro safety encoder is attached to the AGV's drive axis and provides support for performing safety functions such as SSM (safe speed monitor) and SLS (safely-limited speed). Interaction between the encoder and the control system enables the control system to reduce the speed of the AGV as necessary. The SBC (safe brake control) and SS1 (safe stop 1) or SS2 (safe stop 2) drive monitoring functions make it possible to trigger and safely monitor an emergency stop of the AGV. This encoder also acts as a signalling device for AGVs that have complex navigation requirements. As these vehicles are given more freedom to move around, safe movement monitoring has to overcome the obstacles that this brings.

Transport vehicles with differential drives feature two independent drive units, enabling movements such as rotation on the spot. Without safety-certified encoders, executing complex processes like these would require significant time and effort to be spent on creating the right control system. The certified DFS60S Pro, on the other hand, provides a simple and safe way of recording direction of travel and speed information. In turn, this makes it possible to create separate, independent travel profiles for vehicles.

Advantages of an integrated safety concept

This concept can be implemented using not only HIPERFACE motor feedback systems (SRS/SRM50 and SKS/SMK36), but also motor feedback systems featuring the HIPERFACE DSL digital interface (EFS/EFM50 and EKS/EKM36). The single-cable technology used with HIPERFACE DSL cuts the amount of cabling work the manufacturer has to do in half. Advantages include:

- Only a few male connectors and cables are required.
- Fewer components.
- Complete drive system from one manufacturer.
- Quick certification.
- Short response time for errors.
- Easy availability of the control parameters.

SICK Pty Ltd
www.sick.com.au

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interruption of the safety light curtain, for instance, this equipment prevents the need to switch the entire drive control system to a safe energy-free state in order to trigger the required stop response. Drive technology in machine tools — particularly presses — is seeing a shift in favour of electric drives, generally of the servo variety. Electric drives make it possible to feed energy into more specific points in a process, enabling more accurate control of processes, cost savings and improved product quality. The faster traversing movements of the axes also boosts productivity.

Two encoders can be connected to each Drive Monitor FX3-MOC0 module, with the following achievable PLs:

- PL e for one axis with non-safe motor feedback (MFB) and additional external encoder.
- Up to PL d for two axes, depending on the motor feedback being used (safe or non-safe MFB) and without an additional external encoder.
- PL d for one axis and a DFS60S Pro safety encoder.

Safe monitoring of automated guided vehicles

The SICK Safe Motion Control solution, consisting of the DFS60S Pro safety encoder and the Drive Monitor FX3-MOC0, is a suitable solution when it comes to safe drive and motion monitoring for mobile machinery such as automated guided vehicles (AGVs). This solution

Machinery health analyser for use in explosive dust environments

Emerson's CSI 2140 Machinery Health Analyzer has been certified for Class II, Division 2 Groups (F, G), making it suitable for use in hazardous combustible dust environments. Class II, Division 2 certification covering industries including grain processing, food production, chemical manufacturing, recycling facilities and coal-fired power plants.

The portable vibration analyser, which is already ATEX and IECEx Zone 2 and Class I, Division 2 Groups (A, B, C, D) certified, is approved for use in most industrial hazardous areas in the US and Canada. It provides an early indication of bearing and gearbox defects before they can lead to machine outages.

The product is suitable for use with most types of equipment in hazardous environments. Its PeakVue signal processing methodology cuts through the complexity of machinery analysis to provide a simple indication of equipment health.

Emerson Process Management Aust P/L

www.emersonprocess.com.au

Torque limiters for machinery protection

The Deserti-Meccanica LASS series ball/roller bearing-type torque limiters are safety devices that protect mechanical transmissions and relevant assemblies subjected to repeated overloading or any event caused by incorrect operating conditions.

Suitable for a wide variety of applications, the series provides precision machinery protection by operating a series of balls (or rollers) in one side of the device (control element) that rests in mating sockets or detents in a pressure flange on the opposite side. The control element attaches to the driven shaft while the driven component attaches to the pressure flange (sometimes called the thrust flange).

The entire device rotates with the driven machine until an overload occurs, at which point the two mating halves of the device move axially apart against the spring force. The balls slide out of the detents, letting the two halves rotate relative to each other. The product then disengages at a preset torque value.

Tripping of the limiters is total and definitive, causing transmission to stop mechanically. It also stops the drive unit by means of an electrical device (micro switch). This device is equipped with a 'feeler' in contact with the surface of the limiter's mobile half-coupling. The series operates from a range of 23 to 2000 Nm.

PT Link Sales Pty Ltd

www.ptlinksales.com.au

Getting a safe handle on winter

With the way the weather has been on the east coast of Australia lately, you wouldn't know that winter is around the corner. However, as we head into the colder months, now may be the time to think more about your safety, and those of your workers, when outdoors.

According to Brad Rodgers, product development manager of Pro Choice Safety Gear, handling cold, wet or oily materials with the incorrect glove type can create safety issues, since our hands can lose feeling and control when they become too cold.

"If your glove does not have a barrier against that liquid or ice, the moisture soaks through and your hands could become wet, cold and potentially slip inside the glove," said Rodgers.

"As your hands become increasingly cold and numb, sensitivity is lost and the ability to control the materials you are handing is reduced. Whether it's from dew, morning frost or guys working in cold storage, cold hands cause problems."

He said that a glove such as Pro Choice's ProSense Stinga Frost cold weather dipped work gloves are a suitable choice for workers due to a dual-layered liner. This features nylon and brushed acrylic to keep the hand warm and a PVC foam coating to protect against cold, moisture, oil and grease.

"They are lightweight and breathable and, because they feature a knitted liner and PVC foam coating, they offer excellent fit, feel and dexterity," said Rodgers.

The PVC coating also offers good gripping characteristics and abrasion resistance, similar to riggers' gloves but in both wet and dry conditions.

"Leather can become slippery when wet," he said. "The Stinga Frost cold weather dipped work gloves are perfect for anyone who is working in cold storage or outdoors during winter: road workers, riggers, brickies, labourers, landscapers and fisheries, or those who are handling chains or ropes that have moisture on them."

The gloves also work to reduce the occurrence of skin conditions such as dermatitis, commonly associated with frequently wet hands. Workers are encouraged to also look for a high protection rating and to ensure their winter gloves are independently tested by a third-party laboratory to EN388 Protection Against Mechanic Risk and EN511 Protection Against Cold.

For applications where the back of the hand will come into contact with grease, oil or moisture, Rodgers recommends a fully waterproof glove.

"Matching the correct glove type to an application, including a combination of fit, comfort, dexterity and feel, as well as the glove's level of protection, is critical to ensuring adequate protection," he said.

ProChoice Safety Gear
www.prochoice.com.au

NEW
PRODUCTS

Industrial skin protection solution

The Peter Greven Skin Care three-step industrial skin protection solution is designed to protect workers from occupational skin disease and dry hands. It includes hazard-specific before-work skin protection creams, solvent-free hand cleaners and after-work skin conditioners.

The products are made from ingredients that can help keep workers' skin healthy, while the portion-control dispensers reduce waste and overuse.

Designed to be tough on dirt and gentle on hands, the products are solvent-free, biodegradable, won't clog drains and come in fully recyclable packaging.

The Greven Skin Care information boards help workers identify the correct product to use and are a convenient visual reminder of the importance of a step-by-step skincare regime. Portable pump packs and heavy-duty wipes complete the range and are suitable for mobile workers.

Pryme Australia Pty Ltd
www.pryme.net.au

Heated workwear

The Milwaukee Tools Gen 6 range of heated workwear consists of the three-in-one Ripstop Jacket and Ripstop vest, a redesigned women's heated jacket and improved run time on all heated jackets and hoodies. Providing warmth and comfort for all-day wear in cold and harsh conditions, the garments are equipped with carbon-fibre heating elements and multilayered fabric technology.

The Ripstop jacket and vest both feature 900 Denier Ripstop fabric, high wear zone reinforcement and heavy-duty construction for protection from harsh conditions on-site. Both are insulated and also wind- and water-resistant, keeping the weather out while the high-loft insulation and brushed thermal lining maximise warmth.

The redesigned M12 women's heated jacket optimises style, fit and heating zone locations. Designed to actively stimulate blood circulation, the heat zones are positioned closer to the body, located on the back, collar and pockets for warmth.

The company has also improved and upgraded run time of its core heated gear range. Powered by M12 REDLITHIUM battery technology, the jackets and hoodies provide up to 8 h of continuous heat for a full day of work on a single battery charge. The garments are also washer- and dryer-safe.

Milwaukee Power Tools
www.milwaukeetools.com

Warning light for forklifts

The LEDWL-FKLT-BLUE Forklift Warning Spotlight is designed to warn pedestrians and bystanders when they are in the path of an oncoming forklift. The compact LED light produces a 2250 lm output of sharp blue light with low amp draw, 50,000 h service life and 9 to 60 V compatibility.

The blue warning spotlight is designed to provide a warning indication required by OSHA to keep employees and pedestrians within the workplace safe.

The series consists of a low-profile, lightweight light bar that can be mounted in tight spaces. The units can operate in temperatures of -40°C to 80°C, are waterproof to 1 m and resist ingress of dust, dirt and humidity. The housings are formed from extruded aluminium and the lenses are polycarbonate. The LEDs have inherent LED resistance to shocks and vibrations with a 15.6 g rating of vibration tolerance.

Larson Electronics
www.larsonelectronics.com

Digital valve controller software

Emerson has enhanced the software for its Fisher FIELDVUE DVC6200 series digital valve controllers, which are now available for use by process industries with PLCs and PROFIBUS communications as the dominant protocol. It is suitable for industries including food and beverage, water and wastewater, pulp and paper, and metals and mining.

Available in a variety of materials, including stainless steel, the device comes with mounting kits to accommodate different actuators. Mounting kits can be re-used in upgrades to existing FIELDVUE instruments. For control valves located in critical or hazardous areas, the product may be remotely mounted to enhance its performance in harsh process conditions such as high heat or vibration.

The FIELDVUE DVC6200p digital valve controller with Device Type Manager (DTM) software supports control valve start-up, commissioning and diagnostic activities. It has also been tested and integrated for use with multiple Field Device Tool (FDT) host systems.

Using human-centred design concepts, the product simplifies control valve set-up and monitoring. Its intuitive set-up, auto-calibration and simple tuning features save time during commissioning. With the failsafe option, users can set the instrument to hold its last value or position to actuator fail, based on control valve process needs. By incorporating control logic, module assignment and linkage-less, non-contact sensor technology, the digital valve controller and DTM software are simple to install, provide plug-and-play capabilities and perform well in harsh environments.

Emerson Process Management Aust P/L
www.emersonprocess.com.au

THINGS TO CONSIDER WHEN SELECTING
A FIRE PROTECTION CONTRACTOR

John Lynch, General Manager Business Support Services, Wormald

As industrial, construction and mining sectors undertake rationalisation programs and centralise procurement, cost and efficiency are weighing more heavily into the purchase of fire protection systems than ever before. While these are important considerations, this should never be at the expense of life safety.

The unfortunate reality is that selecting low-cost fire protection systems may result in low-quality equipment and inferior servicing and maintenance capabilities. This can have devastating and costly consequences.

A fire incident can result in significant staff injuries, fatalities and costly damage. In specialised industries, damage to custom-built machinery can put a rapid halt to operations as equipment is rebuilt over months or even years.

In addition to installing an appropriate fire protection system, businesses must ensure sprinklers and equipment are properly maintained and tested, and comply with Australian Standards and any regulatory changes. Ultimately, if fire systems are not regularly checked by professional and licensed providers, they may not perform as intended during an emergency.

A careful and consultative approach to selecting fire protection systems is vital. Fire protection is a shared responsibility and it is essential that all those involved with fire safety (including procurement departments, health and safety teams, and on-site management) invest in quality fire protection solutions.

Appointing a reliable and quality fire protection provider requires careful consideration of a number of factors, including those set out below.

1. Insurances

Always work with a reputable fire protection company that holds appropriate public liability insurance and professional indemnity insurance. The Fire Protection Association of Australia's (FPAA) Providers of Choice are bound by a Stringent Code of Practice that requires insurance cover for public liability and professional indemnity.
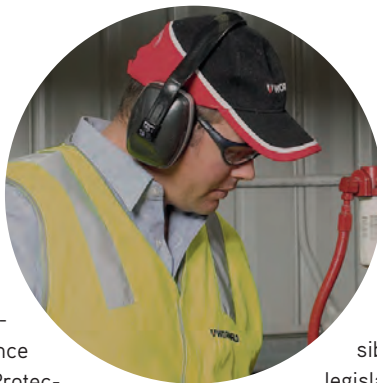
2. Licences

Licences vary between states and territories and unfortunately, there are some providers in the industry who do not hold all the necessary licences. It is important to address this during the procurement process. Always select a fire protection provider that holds all required state and federal licences or certifications, and whose staff are suitably qualified in all practising activities.

The FPAA recently introduced its Fire Protection Accreditation Scheme (FPAS), which provides professional recognition to technicians for their training and competency. Wormald has committed to accrediting all of its inspect and test technicians under this program and will move its business towards FPAS Recognised Business status.

3. Reach

For Australia-wide businesses, using a national fire protection provider can help to centralise processes, minimise inconsistencies and capitalise on economies of scale. Look for a fire protection provider with a wide branch network and that has a presence in every state and territory your business operates in.

4. Local expertise

Fire safety is heavily regulated and it is the responsibility of every organisation to comply with appropriate legislation and Australian Standards. The national building code, Australian Standards, the principal workplace health and safety regulations in each state and territory, and state and territory legislation governing the maintenance of fire protection systems are central to fire safety.

Failing to comply with these can compromise safety and result in hefty fines. It is important to work with a fire protection company that demonstrates a strong understanding of local and national requirements in relation to regulatory audits, compliance codes and reporting.

5. Reporting

Coupled with vigilant human management, smart reporting technology can make it easier and faster to keep track of fire protection systems and maintenance systems, especially for those businesses with sites located across different states and territories. Reporting systems such as Wormald Connect, an online portal that provides real-time visibility and 24-hour access to fire service calls and inspection data, can help to centralise fire safety maintenance and ensure every site is compliant. In addition to Wormald Connect, Wormald offers key account management to provide customers with one point of contact.

Wormald
www.wormald.com.au

NEW PRODUCTS

Personal gas monitors

The Industrial Scientific Ventis Pro Series Multi-Gas Monitors are lightweight wearable instruments that workers can keep at their sides to safely detect gases in their working environments.

The series includes the Pro4 four-gas and the Pro5 five-gas models. The Pro4 is suitable for fire service, steel and construction industries as it offers up to four configurable sensor options, including LEL/CH_4, O_2, CO, CO/H_2 Low, H_2S, SO_2, NO_2 or HCN. The Pro5 is configurable to detect up to five gases and can also detect NH_3, CO_2/hydrocarbon IR, CO_2/CH_4 IR and CO/H_2S. This smaller model is suitable for industries such as oil and gas, power generation, metal and coal mining and gas utilities.

Both models feature iAssign Technology, which tracks users and sites in real time using NFC to help safety managers identify and address gas hazards. A panic button and man-down alarm alert nearby workers when someone is in distress or has lost consciousness. Acknowledgeable gas alerts let users know when they are in the presence of gas below the low alarm level, enabling them to take safety precautions while continuing to work. The alarm action messages provide written instructions during low and high alarm events, helping workers to react appropriately.

The series is IP68 rated, meaning the instruments have the highest level of protection against dust ingress and can withstand being submerged in water at a depth of 1.5 m for 1 h.

Industrial Scientific Corporation
www.indsci.com

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Falls victim issues safety warning: plan the job

Edward (Ted) Newton used to think safety got in the way. Then he fell head first off a second-storey balcony at home, crashing onto garden rocks and suffering serious injuries.

The 69-year-old is a crew leader in Unitywater's Southern Civil Maintenance team in Queensland. A former employee of Redcliffe City Council and Moreton Bay Regional Council, who joined Unitywater when it formed in 2010, Newton has 28 years' experience in the water industry.

Image courtesy of Unitywater.

"In the past I've not been one of the safest workers," Newton said. "My main emphasis was getting the job done, and I often used to think safety got in the way.

"I now realise that was the wrong view."

The crew leader acknowledged the strong focus on safety at his workplace of Unitywater, but he became complacent when it came to a simple repair to a balcony railing at his home late last year.

He broke his shoulder in three places, fractured his skull, cut his arm and suffered damage to his ribs, knee and feet. Forced to take four months off work, he still experiences after-effects from the fall, having lost his sense of taste and smell.

"Believe me, if it happens to you, it changes you," Newton said.

"I wish I had a chance to go back. Why didn't I take a few precautions?"

Newton was so intent on reminding others about the importance of safety that he approached his employer, Unitywater, to help him get the message across. The result was a compelling video of him simply telling his story.

Newton shared these simple tips so that others may avoid experiencing a similar accident.

"Find a way yourself of doing a risk assessment on everything you do. Plan the job, make sure you've got the gear to do it and take plenty of time."

Unitywater Executive Manager People, Culture and Safety Kenan Hibberd praised Newton for being so willing to share his experience for the benefit of others.

"What happened to Ted was a tragic accident," Hibberd said. "But even Ted acknowledges it could have easily been avoided if he took a few simple safety precautions.

"We want our employees to go home safely to their families every day, and continue being safe, whether they're at home or at work."

Unitywater is celebrating a record low rate of workplace injury in the most recent financial year, returning a lost time injury frequency rate of just 0.8.

The significant injury frequency rate was down 58% to eight, enabling Unitywater to save $382,000 on workers compensation costs.

The company has achieved dramatic decreases in injury rates among its staff with historic data showing the lost time injury frequency rate was 34.5 in 2010–11, 23.7 in 2011–12, 6.8 in 2012–13 and 1.4 in 2013–14.

The number of lost days resulting from workplace injuries has fallen markedly from 951 days in 2011/12 to just one day in 2014/15.

"We have been able to achieve this excellent result through continued investment in safety management systems and medical programs, with a new focus on improving employee health and wellbeing," Hibberd added.

"Staff across the business have embraced the shared responsibility for keeping each other safe.

"That dedication to looking out for each other has improved morale, teamwork and wellbeing outcomes for staff."

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