

First Watch Special Edition

*Great ideas lead to safer, healthier workplaces –
an innovative and proactive approach to prevention*

Entries open for 2012 Innovation Awards

The Chamber of Minerals and Energy of Western Australia launched its 2012 Safety and Health Innovation Awards in September.

These awards are the WA resource industry's peak safety innovations accolade, recognising creativity and ingenuity in improving workplace safety and health.

With three categories – People, Systems and Engineering – the awards are open to all WA minerals and resource companies, sites and contractors associated with the sector. Companies are not limited in the number of entries they can submit.

Entries remain open until 11th November, 2011. For full details, contact Fiona Cross at the CME on 9220 8512 or visit the CME website at www.cmewa.com.

Now into their eighth year, the awards attract a broad range of innovative ideas from around the State. Following are some of the entries from the 2011 awards.

Alcoa of Australia

Grader Cutting Edge Cradle

Alcoa of Australia's Willowdale bauxite mine in the Darling Ranges employs 500 people. The company is committed to the creation of an injury and incident free workplace through leadership, employee engagement, innovation and continuous health and safety improvement and as part of this, a maintenance crew at Willowdale identified several hazards associated with changing grader blade cutting edges.

New cutting edges are usually supplied in packs of four or more and are strapped with tensioned black steel. The edges often stuck and required separating using a crow bar. They were then manually handled on to a forklift and taken to the job, where two or three workers had to manually lift the edges from the forklift tines on to the grader blade. They were then aligned to the mounting holes by hand while bolts and nuts were installed.

Strain and sprain injury risks from manually handling the cutting edges were the most obvious hazards, while lacerations from removing the tensioned steel strapping were considered another potential risk.

The crew conceived the idea of a cradle that would hold the edges at a compatible angle to the grader blade. The cradle is raised by forklift and the edge mated to the blade and bolts inserted while the weight is supported by the forklift.

The cradle was designed and trialed successfully. Working with the suppliers, Bradken, Alcoa was able to arrange for new cutting edges to be supplied already mounted on to the cradle, eliminating any requirement for manual handling. The edges are secured to the cradle using ratchet straps, eliminating the laceration injury risk. Empty cradles are returned to the supplier for restocking.

The design can be easily transferred across industry and the concept has the potential to be further developed to accommodate other ground engaging equipment.



Alcoa worked with the supplier to ensure grader cutting edges came pre-mounted on the cradle

BHP Billiton Iron Ore

Ships' Lines

Failing ships' lines pose a considerable risk to employees and business efficiency.

Employees involved in the berthing and sailing of vessels work in close proximity to taut ships' lines. The lines contain a significant amount of stored energy and failure represents an uncontrolled release of energy that could result in fatalities.

When lines failed on a ship in Port Hedland, the result was uncontrolled movement of the vessel within the inner harbour. Such movement is recognised as an Enterprise Wide Risk.

BHP Billiton Iron Ore embarked on a project to design, develop and install a number of engineering controls and associated technology to mitigate the risk associated with failing ships' lines. The solution includes:

- Locking pins to ensure the security of capstan hooks;
- Guarding to facilitate the navigation of loaded dolphins;
- Load cells to determine tension on ships' lines;
- Distance measuring equipment to identify drifting vessels;
- Visual and audible alarms to warn of hazardous scenarios; and
- Installation of marine radios in the Central Control Room for emergency response.

To complement these controls, a number of administrative measures have been taken and rolled out to employees and contractors working with ships' lines. These include:

- Restricted access to the berthing dolphin walkways;
- Prohibiting access to loaded dolphins by employees – ships are required to slacken lines before employees approach them;
- Substitution of steel wire ropes with nylon ropes;
- Development of a manual and associated procedures;
- Formal competency assessment of employees;
- Changes to the surveying contract to ensure ships' surveyors meet minimum competency levels; and
- Development of emergency response procedures.

Project work had to be coordinated around the tidal nature of vessel berthing and sailing times.

Prior to the implementation of the program, failed ships' lines were recorded as significant events from a safety perspective, which are regarded as posing a potential fatality risk.

Failed ships lines are now scored from a business risk perspective and the safety risk is now considered to be low.



BHP Billiton Iron Ore's ships' line project resulted in significant safety and efficiency improvements

RIO TINTO

Remote Switcher

The switching of oil circuit breakers (OCB's) is a risky process. There are many documented cases of devices exploding during switching, posing a significant risk to operators.

A recent failure saw an OCB in a substation explode with such force that it blew the substation door off. The door hit an operator standing outside who was lucky to only receive a broken arm. Had he been inside the substation, he may have been killed.

With a large number of OCBs across its Pilbara sites, Rio Tinto sought a solution to provide extra protection to workers involved in OCB operation. This required operators to be well away from the danger zone and led to the development of a remote switching unit.

The switcher had to be cheap to build and easy to use. It also had to be portable and adaptable to different brands of OCB.

The initial design concept involved a lead connected to a control box, but this was deemed to make operation more difficult which would potentially inhibit the widespread adoption of the device by operators. A revised design incorporated a wireless connection between the switcher and the control box. An added benefit of the wireless design is that in the event of a breaker explosion, there are no conductive cables down which power could travel, thus further reducing the risk of injury or fatality.

Both the remote control unit and switcher are battery powered.

The remote uses a single nine-volt battery and the switcher a 12-volt gel cell which can be recharged. A linear actuator is used to take the place of the operator. It travels in or out via the signal from the control box. The switcher stand is made from cheap materials that were available at an onsite workshop.

The initial unit was tested on a spare breaker with a number of operators involved.

The stand for the switcher was manufactured by the heavy equipment workshop and all electronics by the electrical engineering department.

No introduced hazards have been identified since the introduction of the device. Inadvertent switching was considered a potential risk if an operator accidentally pushed the close button on the remote. To avert this, a safe work procedure was written to inform operators of correct use of the device.

The remote switcher is a simple and easy to use alternative to the close proximity H.V switching that was being carried out on site. It removes the operator from the danger area when carrying out switching operations and provides peace of mind and further reduction of on-site safety hazards.

The total cost for a single unit is less than \$700 and no special tools are required for its manufacture.

Westrac

Engine Lifting Bracket

Lifting tags and slings have long been used at Westrac workshops to remove and fit engines to trucks.

This required technicians to manually manoeuvre the engine to engage it with the flywheel housing and often involved fighting against the sling which was pushing against the bulkhead.

The proximity of the bulkhead of the truck meant the sling had to be on an angle and there was risk of damage to equipment and injury.

To overcome these issues, Geraldton plant mechanics Eric Garraway and Jason Hildebrandt came up with a lifting bracket that moves the lift point forward and, with the use

of a spreader bar, allows drop chains to hang vertically.

The bracket allows the engine to be suspended horizontally which aids installation on to the flywheel housing.

The bracket allows the engine to be fully installed and still maintain clearance in the region of the bulkhead. This has resulted in a number of significant benefits including:

- Safer lifting techniques;
- Reduced physical effort;
- Less risk of damage to customers' property;
- Time saving in regards to manual manoeuvring; and
- Less risk of damage to lifting equipment.

BHP Billiton Nickel West

100-Day Safety Challenge

BHP Billiton's Nickel West Kwinana operation places paramount importance on the group's Zero Harm philosophy for all employees and contractors. Despite having solid Zero Harm strategies, practices and processes in place, Nickel West recognised that the Kwinana site experienced a recurring plateau each year that could see a drop in attention and commitment to safety across the workforce.

The management team was put on notice to change attitudes and motivate staff to increase the ongoing commitment to safety. The challenge was to reinforce and communicate appropriate safety messages in engaging and personal methods to ensure safety remained the number one priority at all times.

The leadership group initiated the 100-day Safety Challenge, which required employees and contractors to aim to work 100 days without a recordable injury.

Every department manager at the refinery was responsible for assessing and improving safety awareness, as well as accounting for any recordable injuries during the 100-day period. If a recordable injury occurred, the relevant manager was required to demonstrate any actions that would have been performed differently to prevent injuries from occurring.

The 100-day Safety Challenge was launched with a safety week to create awareness across site. A presenter addressed the entire workforce about the impacts and consequences that work-related injuries or accidents can have on the lives of employees and their families. The speaker provided real-life examples that highlighted the need for behavioural change and a solid commitment to safety.

Nickel West introduced compulsory Safety STOP meetings to address a range of pre-identified safety issues that existed in the workplace. The 15-minute meetings were held each week and, in addition to creating awareness on single safety issues, created a forum for employees to open communication pathways on new safety issues. Topics varied each week and included significant risk areas, safety solutions and responses to mitigate safety risk. The success of the Safety STOP meetings resulted in it being shared across other sites within Nickel West and the broader BHP Billiton group.

During the 100-day Safety Challenge activities were rolled-out across all areas of the workplace. These ranged from one-day events to ongoing programs that are still in place today.

Nickel West also implemented a range of programs focused on improving safety leadership. Workshops were developed



BHP Billiton's Nickel West Kwinana refinery engaged the workforce with its 100-day Safety Challenge

to articulate safety leadership attributes in alignment with the BHP Billiton Leadership Model. Over 110 front-line supervisors attended a Supervisory Development Program Essential Skills Workshop and all operators completed Zero Harm training to build awareness, knowledge and understanding.

Detailed analysis of injury performance was undertaken to help leaders understand the level of risk within their teams and assist in developing response strategies. Leaders of teams that could consistently work long periods without recordable injury were identified and received positive recognition. Coaching was provided to leaders and teams with less favourable performance to assist in the improvement process.

The 100-day Safety Challenge was successfully completed from July to November 2009. In fact, the refinery achieved a new record of working 197 days without a recordable injury - the previous record was 117.

A clear attitude shift and commitment to reaching the target was noticed. Since the completion of the 100-day Safety Challenge, Nickel West Kwinana has continued the weekly Safety STOP program with multiple topics developed and delivered to staff.

There has been a reduction in the rate of recordable injuries onsite and people now believe they can achieve long, sustainable periods free of recordable injury.

The program behind the 100-day Safety Challenge can be applied to any business within or external to BHP Billiton - some of the initiatives within the program have already been adopted by other Nickel West sites.