Safety technologies: what planet are we on?

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For decades researchers have reported the difficulties workers encounter when identifying risks and controls in the field. In response, miners have increased their investments in training alongside a plethora of related initiatives.

Despite these efforts, the most recent research suggests even highly trained workers and experienced superintendents cannot identify all relevant risks and controls.

Of greater concern is there's a lack of correlation between training and experience and risk identification.

Which raises the question - if the problem is only human, why don't training and experience solve it? Because the problem is not just human, it is also mathematical.

Workers must continuously navigate infinite and dynamic in-field scenarios. If a worker can only encounter a maximum of 20 risks and employ a maximum of 20 controls, they must safely navigate more than 1 trillion possible in-field scenarios (combinations of risks and controls).

Of course, workers regularly encounter many more risks and controls and most employers have identified hundreds of each.

To put these numbers in perspective, our galaxy has about 300 billion stars. When we ask workers to select the correct combination of risks and controls, we are asking them to select the single safest star from amongst all stars across at least three galaxies - and reselect when conditions change.

At the same time, compliance inspectors have more than one trillion chances of finding a safer star. This is not just food for thought in terms of how we manage non-compliance, it's a safety challenge that's mathematically astronomical.

The implications for today's safety systems are deep and wide. As just one example, it means our long-held suspicions about the inadequacies of some in-field safety templates were accurate. Pre-work checklists not only generate tick and flick responses, they fail to prompt or support workers to consider the domino effects of risk correlations across tasks, environments and change. The greater the reliance on pre-work checklists, the greater the need to consider every possible in-field scenario.

Similarly, the greater the reliance on blank templates populated in-field (such as risk assessments) the greater the need for real-time intelligence that prompts and supports workers to select the correct combination of risks and controls.

The implications for the future nature of work and resulting safety systems are even more profound.

For AI to replace workers, a minimum amount of data is required per in-field scenario. In contrast to the assumption technology will soon remove people from harm's way, it's much more likely we'll see increasing concentrations of workers in unpredictable environments. Indeed, in June 2018 the McKinsey Global Institute forecast that demand for occupations involving unpredictable environments would continue to grow until at least 2030.

Over and above this, given the social impacts of workplace deaths and injuries, society will hold AI-based safety systems accountable to the highest standard of data integrity and a zero tolerance for 'black box' algorithms.

On the upside, miners are increasingly collaborating. As this collaboration matures it will standardise those industry processes with the least competitive differentiation (such as the design of safety templates) and consolidate the technologies and data used to manage those risks with asymmetrical outcomes (including safety).

In light of the above, miners have three clear safety priorities.

First, seek out technologies that support and enable workers to navigate infinite and dynamic in-field scenarios; they'll add the greatest value in the short term and beyond 2030. Second, avoid bespoke safety templates and the technologies designed to build and distribute them. It's unlikely you'll recover development costs - far less supplier induction costs - before safety templates are standardised, and you'll be left carrying unnecessary maintenance costs and a lone-ranger dataset.

Finally, don't wait for AI. Get ahead of the concentration curve by collaborating with suppliers and competitors to standardise templates and technologies and to share data. Remember, collaboration doesn't require industry-wide agreement - just two parties can halve risks and costs. **NMC**

Bridging traffic concerns

BY LUCAS DA PAZ

To prevent the potential risk for a rail road accident at an intersection, Roy Hill Iron Ore will pump $18.66 million into the construction of a single-span rail bridge, carrying Great Northern Highway across the Roy Hill rail line.

The construction of the bridge will see the removal of the at-grade rail crossing, enabling free movement of traffic over the rail line.

Main Roads WA is delivering the project, having managed the design and procurement processes, and will oversee the construction, future operations and ongoing maintenance of the bridge.

Roy Hill CEO Barry Fitzgerald said the construction of the rail bridge was a demonstration of Roy Hill's commitment to benefit the wider community.

"Roy Hill's trains pass through the intersection up to 13 times a day, with one train taking on average 3.5 minutes to pass through the crossing," he said.

"The construction of this rail bridge will not only remove the risk of a road user collision with one of our trains, but

significantly reduce road user travel time and improve traffic flow."

Along with the original alignment of Great Northern Highway, traffic will be maintained for the majority of the works, however, side-track access will be placed towards the end of the works at Roy Hill Access Road and Great Northern Highway intersection.

Georgiou Group was selected by Main Roads to construct the

(L-R): Roy Hill CEO Barry Fitzgerald, Environment Minister Stephen Dawson, Transport Minister Rita Saffioti, WA Premier Mark McGowan and Member for the Pilbara Kevin Michel at the Roy Hill Rail Bridge site.

Greater Northern Highway, beginning work in August, with completion expected by March 2019.

The construction contract is projected to deliver more than 65 jobs, including employment for local Aboriginal business Gebro Contracting, which was appointed as the project site supervisor.

Georgiou Group Manager Peter Hopfmueller said the

company would bring a wealth of experience in major transport infrastructure construction in Western Australia, having recently delivered the Marble Bar Road upgrade.

"We have brought together a team with extensive local knowledge and are very excited by the opportunity to build our relationship with MRWA to deliver on the project's objectives," he said. **NMC**