



As rail businesses edge towards their target of zero injuries, improving safety performance can plateau. Amey's sector director for rail, **Lee Jones**, explains how embracing tech, smart data and human science could help the infrastructure provider expand its safety frontiers.

WHAT NEXT FOR SAFETY?

Over the last decade, safety performance has improved significantly. However, according to the Rail Safety Performance Report, driving is now the leading cause of workforce fatality over the last decade.

Here at Amey, we believe any injury is one too many. Our Target Zero campaign sets out our core objective of achieving zero harm to our people, the public and the environment by having the right culture and behaviours in place. Thanks to Target Zero, last year the Accident Incident Rate in our rail business reached its lowest level since 2001, and we picked up a UK Rail Industry Award for workplace safety.

But if the history of safety performance tells us anything, it's that this onward downward trajectory will be difficult to maintain. The performance improvement which comes from every major breakthrough will eventually plateau as it becomes normal practice. We need new ideas to keep pushing forward the frontiers.

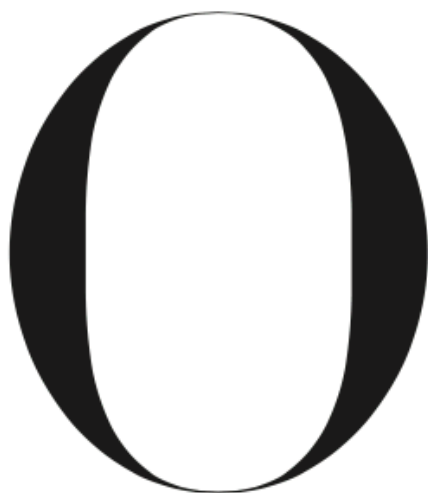
Steady but not spectacular improvement to safety may be business as usual for many, but this is not where I want the rail sector to be. Here at Amey, we are working towards major advances that deliver a step change in safety, which is transferable outside of work.

This year we have been really challenging issues at the heart of risk, such as late changes to planned work, rigorous site cleansing before work, driving and behaviour. One of these was a particular root cause of issues. Late requests to alter or increase the scope of planned work have knock-on implications for risk assessment and mitigation. They can lead to increased pressure on teams and late working.

Any customer-led organisation will tell you that pushing back on late requests from clients is hard. It causes administrative pain too. But insisting on having enough notice to plan means that our teams are not accepting the risks, and we are beginning to see the benefits.

Harnessing technology

These types of initiatives are the backbone of any good health and safety programme – but we are also looking to the future. Recent advances in technology and human science have opened up previously unimagined scope for addressing both the physical and mental environments people face at work towards creating a more holistic, people-centric safety framework.



Over the last 60 years, improved equipment, better training and strong leadership has transformed accident rates across industry. In the UK rail sector, working practices and culture have driven an overall reduction in harm on running lines, and the number of fatalities among infrastructure workers are few.

According to the RSSB's latest Annual Safe-



Number one: tech. Remote technology, robotics, cybernetics, visualisation and simulation have enormous potential to be applied in the field of health and safety. Obvious applications include the use of drones and robotics to remove people from hazardous environments altogether. And we are increasingly probing the possibilities of biometrics and immersive experience training to reach out to people on a personal scale.

Projects like the AmeyVTOL precision, long-range, hybrid drone, making it safer, quicker and easier to survey and assess vital civil infrastructure, are a direct result of this approach.

Amey's tier one membership of the pioneering Manufacturing Technology Centre (MTC) in Coventry is helping us develop other technology-driven solutions. The MTC brings together engineers and technicians from industry and academia to help bridge the gap between university-based research and the development of innovative manufacturing solutions.

We are now in the early stages of developing the use of radio-frequency tethering to create virtual safe zones and the creation of virtual reality sites to allow remote site survey and hazard identification.

We are also investigating the potential for virtual reality training. Research has identified that people who have had a near miss often have much better safety behaviours. A near miss with a 125mph train, once experienced, is never forgotten. No amount of literature can recreate the emotional lesson that can be taught in the total safety of a virtual reality environment.

Tackling fatigue

Amey has also been trialling the use of wearable biometric technology to monitor body states and identify states of stress, such as high temperatures, drowsy driving and even slips, trip and falls with

considerable success.

According to the road safety charity Brake, one in six crashes resulting in death or injury on major roads are fatigue-related. So, working with a Canadian company specialising in fatigue science, we used wearables to monitor the sleep of 60 of our people for a month. The results were sobering. Some were sleep-deprived to the extent that, at some points during the day, their reaction time and decision-making ability would have been affected to a level similar to that of a driver over the legal drink drive limit.

In some cases, poor sleeping habits were the problem; for one, a heavy cold which affected their rest was eventually pinpointed, but for two the sleep patterns they displayed were cause for greater concern. Hospital intervention diagnosed sleep apnoea, a breathing condition which can be ameliorated with medical help.

This fascinating study gave people personal data which genuinely helped them reduce their risk of harm in all aspects of their lives. It was not a union issue, the information was anonymised, but the response was so positive we have now put a limited annual programme in place which, as well as screening, includes therapy to share the results, sleep hygiene counselling and ongoing consultation. We are also looking at how we can improve rostering and include the advice in our employee wellbeing campaigns.

Developing a safety culture

Second, human science. Safety experts have long recognised the impact of behaviour on safety performance and the importance of a good safety culture.

Top-down drivers of safety culture – I'm thinking of clear management commitment and leadership, training and procedures – pay enormous dividends, but what if we could tap into the thoughts, experiences and

knowledge of every individual member of staff to drive change from the bottom up?

We are now halfway through an award-winning collaborative partnership called SafetySmart, working with psychologists, researchers and human factors experts at Leeds Beckett University to support our Target Zero strategy as part of a long-term Knowledge Transfer Partnership.

The aim is to deliver a bespoke validated safety measurement tool, which identifies the behavioural predictors of accidents in our business and then supports more effective and focused interventions to prevent the frequency and severity of accidents and injuries.

An embedded research associate is working closely with our own employees to research, gather and analyse information about their views of safety across our rail and consulting business unit and, crucially, their personal experience, attitudes and responses to the real situations they face every day.

More than 1,600 workers in our business have been asked to take part in a safety questionnaire, and the remainder of the SafetySmart project will support Amey in its proactive psychological approach to understanding safety.

Our people are our business, so if there's technology available we should be using it. Innovation and technology are the key to understanding the hidden pressures which tempt people to put themselves at risk in the first place, and give them the live data to help them make a better decision.

FOR MORE INFORMATION

E: tim.wood@amey.co.uk
W: www.amey.co.uk