

INNOVATION AND HEALTH AND SAFETY



Highlights from the Major Projects Association event held on 24th October 2019

'The world we see around us today is not the world we will see in 10 or 20 years' time. This is both a great opportunity and a source of real challenge.'

Gary Booton, Director of HSEQ, Amey plc

Major projects are environments of change. Change in the form of digital technology, new applications for which are emerging every month, and in the changing workforce, with five generations of employees now often present on site or in the project. Yet, the statistics for 2018–19 indicate a plateau in the improvement of health and safety in the construction industry and suggest that we have lost our way, with an annual average for fatalities that has been unchanged for the last ten years.

This Major Projects Association seminar on innovation and health and safety aimed to highlight where technology is leading the way to safer workplaces and help organisations understand the forces that constrain innovation and champion the strategies for change.

HS2 AND THE CONTEXT FOR CHANGE

At its peak, HS2 is likely to employ around 30,000 people. This year, in the run-up to civil construction starting in early 2020, the workforce has already reached 10,000. By way of comparison, the Tideway project is running at 600,000 hours of work per month; HS2 is already at 1.7 million hours per month.

The health and safety accident statistics suggest that over the course of the project, three people are likely to lose their lives working on HS2, 700 people will incur a serious injury, and 5,000 people will face some kind of health impairment. This is in the context of the wider construction industry, where the average for annual fatalities at work continues to exceed those from all other industries.

Chief Executive Mark Thurston has set the organisation the challenge to beat these statistics and use innovation to make HS2 the safest and most rewarding project for anyone working on it or living alongside it.

INCREMENTAL IMPROVEMENT

Whilst new technology and big data dangle the lure of solutions to all of the construction industry's intractable problems, the solution to health and safety (and increasingly wellbeing) is perhaps better served by an incremental approach similar to the continuous improvement associated with quality and productivity in other industries.

'Fatal accidents and major incidents tend to elicit a response to the question: "What are we going to do differently?" Organisations consequently add a little more bureaucracy to their processes following an incident which, over time, creates an impossible level of compliance required of project workers and engineers.'

Gary Booton, Director of HSEQ, Amey plc

What is needed is greater simplicity: simple communication, simple processes; create capacity by removing bureaucracy, enabling and empowering front line managers to supervise, coach and support.

There are significant human obstacles to innovation and change: fear of failure, lack of trust of the organisation, concern about unintended consequences. Overcoming this resistance requires us to understand that innovation can make things better – and if an innovative approach fails, we should frame it as a positive learning experience.

CHANGING ATTITUDES

'A piece of paper won't save a life. Younger generations are even less likely than their older peers to read a procedure.'

Dr Shaun Lundy, 4site Consulting Ltd

In the context of an industry where five generations now work side-by-side, we need to find new ways of engaging followers. We need a message that reflects the modern view of health and safety, one which emphasises non-communicable diseases associated with lifestyle, an increasingly ageing workforce and a growing prevalence of stress, depression or mental illness.

Part of this is down to language: make sure that 4D planning tools (for example) put technology in a language that people understand and take the effort to explain the benefits of new technology; who would not want a hydraulic breaker that makes less noise?

Part of it involves understanding (and involving) the interests and concerns of the grass roots. For example, how might human-free construction impact employment and how will the organisation address the risk of redundancies?

Part of it is recognising the appeal of new technology for younger generations – and the new roles associated with it – in an industry that is struggling to recruit the best and brightest new talent.

'Why is construction the one modern industry that the Ancient Egyptians would quickly recognise and understand?'

Steve Hails, Director of Health, Safety and Wellbeing, Tideway

DESIGNING AND REHEARSING FOR SAFETY

'Balfour Beatty's "25% by 2025" goal involves reducing activity on site by 25% by the year 2025 – increasing productivity, improving quality and safety and ensuring value for customers.'

Nick Boyle, Technical Innovation Director, Balfour Beatty

Technology and innovation such as digital reality capture provide the means for reducing risk (e.g. replacing physical inspections of electricity pylons with drones) but also provide the data for digital practice and rehearsal. They are also being used to improve health and safety:

Awareness training – interactive plant awareness training on HS2 embeds the language and understanding of red, amber and green zones to help staff recognise the dangers posed by plant on site.

Installation practice – augmented reality taken out on to Balfour Beatty sites shows people what successful installation looks like, before they build it for real.

Checking constructability – the Tideway BIM 3D QUBE helps operatives understand the constructability of designs.

Rehearsing the project – the Balfour Beatty Digital Rehearsal Room provides an immersive medium for those working on a project to rehearse what will happen before they do it for real.

Measuring and marking – GPS controlled robots used in the Smart Motorway Programme pre-mark white lines allowing greater accuracy in painting. Remote control whacker plates register the progress of the work they are doing, eliminating unnecessary vibration and noise and offering improved safety to operatives.

Autonomous vehicles – autonomous trucks, tested for the first time in the UK on the A14 upgrade, help remove workers from the main source of risk – the site itself.

INNOVATION AT TIDEWAY

Since its inception, Tideway has worked to create an environment in which people feel encouraged to innovate:

- Running campaigns for new ideas such as 'e-Mission Possible: the Carbon Innovation Challenge' or 'Dragon's Den – the Innovation Challenge Week.'
- Building innovation forums where people are encouraged to showcase and share their proposals and their aspirations.
- Recognising the 'Innovation Champions' and providing them with a network to collaborate.
- Designing EPIC: 'Employers Project Induction Centre'; a step change in how they introduce people to the project.
- Designing equipment, such as **modest PPE** and **maternity PPE**, that recognises the diverse needs of the workforce.
- Setting imaginative targets to replace road traffic with river traffic to transport construction spoil and then seeking to beat those targets.
- Training the workforce to meet these targets and validating their competence in the Thames Skills Academy.
- Designing safer vehicles with greater nearside vision to reduce the risk to pedestrians and cyclists.
- Embracing investment in design and technology.

POINTS FOR FURTHER DISCUSSION

- How can we challenge leadership teams to open their minds to the dangers associated with serious but remote risk?
- What medium or platforms might enable the industry to invest in and benefit from innovation collectively?
- How do we create greater awareness of lifestyle diseases?

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With grateful thanks to Rebecca Jones at [Turner & Townsend](#) for her help in organising this seminar.

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