COVID: THE IMPACT ON SAFETY LEADERSHIP INTERVENTIONS WITHIN RAIL INFRASTRUCTURE PROJECTS

Dr Shelley Stiles[1], and Dr David Golightly[2]*

[1] *Gateway Consultants (HSW) Ltd, 58-60 Wetmore Road, Burton on Trent, Staffordshire, DE14 1SN, UK*

[2] *School of Engineering, Newcastle University, UK*

*Gateway Consultants (HSW) Ltd, 58-60 Wetmore Road, Burton on Trent, Staffordshire, DE14 1SN, UK
(Email: shelley@gatewayhsw.co.uk, +04-779633143)

BACKGROUND

Construction-related activities have been seen as a vital part of stimulating the post-COVID economy, and there is much impetus to start work on 'shovel ready' schemes (e.g. UK Gov, 2020). As an example, transport civil engineering is a significant part of this sector, with rail electrification and high-speed rail seen as essential strategies to Support COVID recovery.

Since the start of the COVID 19 pandemic, leaders of safety have been in the spotlight to respond to unprecedented challenges faced across the world. The UK rail sector itself has experienced profound change due to the impact of COVID on passenger numbers and the associated industry response. However, *"despite the reduction in physical harm, 2020/21 saw a relatively high number of workforce fatalities"* within the UK rail industry (RSSB 2021). One area of particular concern is the construction of rail projects where up to a third of all workforce harm is sustained by infrastructure workers (RSSB 2021). Infrastructure workers are exposed to many of the hazards associated with general construction work, as well as railway-specific hazards such as proximity to moving trains and unguarded electricity supplies.

During the pandemic started construction activities in relation to the UK rail infrastructure have been halted or changed and new projects paused while construction practices come to terms with new ways of working. Construction sites have had to adjust to social distancing, implementing new hygiene and Personal Protective Equipment (PPE) measures, and accommodating a greater level of working from home for roles that are not essential to front-line work. The importance of health and hygiene, as well as safety, has never been clearer. All of this has had to occur while maintaining safety in the conventional aspects of work, in a sector which ordinarily has multiple hazards.

One specific factor that impacts safety generally, and may have a bearing on COVID-19, is the organisation of work. Nearly all projects, particularly medium to large projects, are delivered through joint working of multiple organisations. A common project organisation structure is developed, referred to as a 'Project Delivery Organisation'

(PDO) for the remainder of this paper, as illustrated in Figure 1. A Project Delivery Organisation is established with a number of companies, co-ordinated via contractual obligations, for a determined period of time (Rowlinson 2004); key duty holders being the Client, Principal Contractors and the supply chain.
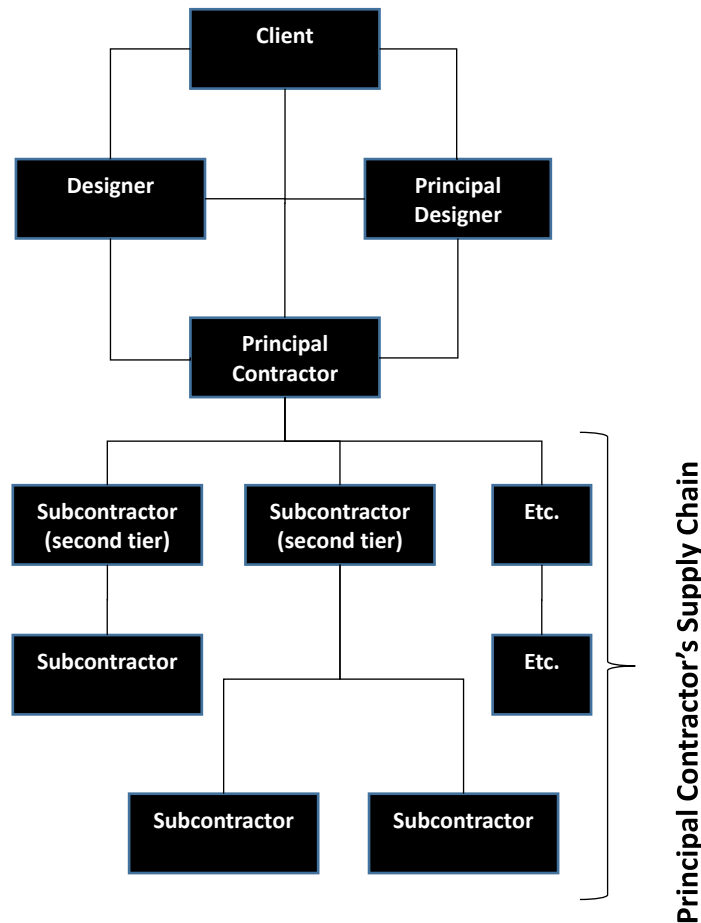

Figure 1: Typical structure of a Project Delivery Organisation

Delivering safety is a significant challenge (HSE, 2019), especially where multiple organisations of different sizes work together, as is typically found in construction projects (Rowlinson, 2004; Stiles et al., 2012; Peneloza et al., 2020). The temporary nature of arrangements can present a challenge for safety leadership (Stiles et al., 2018a), which is a key mechanism for engaging the workforce in safety (Zohar, 2002; Zohar and Luria, 2003).

There are numerous studies that have identified high levels of safety performance are common where there is a genuine and consistent management commitment to safety (Schein 2010, Clarke 1999, Zohar 1980, Mearns and Flin 1999). In particular Schein (2010) states that safety is the output from an organisation's adaptive processes in response to both internal and external factors, and that this response is steered by a leader. Since COVID, Leaders have had to adapt to new ways of working and responding to internal factors (such as maintaining communications, resource allocation and new technologies) as well as external factors (government legislation, industry restrictions etc). This study seeks to better understand these adaptations within UK rail projects.

A previous study by Stiles et al (2018) identified 26 different examples of safety leadership interventions from the rail infrastructure sector. These mostly aligned to the nine good safety leadership areas identified within the literature (Simard and Marchand 1995, Floyd and Wooldridge 1997, Gadd and Collins 2002, Vredenburgh 2002, Zohar 2002, Farrington-Darby et al 2005, Lekka and Healey 2012, Clarke and Flitcroft 2013), such as increasing visibility around safety, workforce involvement, providing recognition for good safety performance and ensuring effective communications. Half of the intervention examples provided were focused on communications; whether these were focused on opportunities for leader engagement or the sharing of information. The findings from this study also found effective safety leadership interventions targeted worker involvement with Senior Management. With adapting ways of working since pandemic, communication has become critical for leaders to maintain engagement with their teams; those working on site, in offices or at home.

The study by Stiles et al (2018) also identified the importance of context when implementing safety leadership interventions. The study found that both industry and organisational factors were worthy of consideration by leaders deploying safety interventions. Two of these are particularly relevant for a post-COVID world. Firstly, consideration being given to other priorities and initiatives that are being implemented at the same time and the role of leaders in delivering these, including time and resource limitations. With industry guidance introduced to support the UK COVID legislation there were many specific interventions specified including social distancing, hygiene, face mask wearing. To what extent could and should leaders be able to continue pre-COVID safety leadership interventions whilst also implementing these new risk control measures? The second element is the transient nature of the industry and associated inconsistent externally-led influencing factors leads to an unstable motivation and conflicting demands. Since COVID it became even more challenging for any organisation/individual to balance the desire to change with day to day operations and delivery the project safely.

Over two years since the beginning of the pandemic, the UK is moving into a phase where COVID has become another risk that organsations have to consider and manage. The ever changing risk profile combined with a return to a 'new normal' for organisations across the country has developed in a post-COVID world. The challenge for leaders is to manage safety in a post-COVID world, where expectations, standards and ways of working have changed considerably,

OBJECTIVE

Prior to the pandemic there was a wealth of research identifying what 'good' safety leadership looked like, yet it is unclear whether these leadership interventions are still appropriate in a post-COVID world. Stiles et al (2021) identified a number of reasons (greater remote working, new ICT capabilities) that might have changed leadership practice. Therefore, there is an open question as to whether leadership practices have evolved, regressed or continued as before post-COVID. This study provides an indication of the current deployment of safety leadership interventions within UK rail infrastructure projects and evaluates the reported impact of COVID.

METHODS

A survey has been conducted amongst fifteen leaders from the UK rail infrastructure projects to identify the safety leadership interventions deployed prior to and post COVID. In addition follow up interviews with seven participants have explored the factors which may have resulted in the type of safety leadership interventions deployed, as well as those which are no longer being implemented.

Both the survey and interviews were undertaken with a purposive sample of representatives from the UK rail infrastructure sector including; Infrastructure Manager, Principal Contractors, Consultants and Subcontractors. This is purposive (Devers and Frankel 2000) in that participants were selected because they were already known by the interviewer to cover the kind of organisations represented in the rail construction sector. Each participant was chosen based on availability and willingness to participate from the first author's contacts within the industry. A study information sheet was provided to all participants prior to their completion of the survey/interview and gain their consent to proceed with their involvement in the study.

A number of different examples of safety leadership interventions from the UK rail infrastructure sector were reviewed, taken from a previous study (Stiles et al 2018). These were developed into a multichoice survey. The survey was set up within an online survey tool with a link emailed to participants for them to complete.

The survey had two demographic questions relating to role and organisation type. These were followed by twenty multichoice questions were participants would provide responses in relation to each of the intervention types taken from the previous study (Stiles et al 2018), for their use of each intervention as shown below:

- Did not use before or after COVID
- Did use before COVID but not since
- Use less since COVID
- Use the same as before COVID
- Use more since COVID
- Did not use before COVID but do now
- Not sure

The survey also included two free text questions and a space for any further comments:
- Are there any new safety leadership interventions that you have introduced since COVID?
- Do you have any further thoughts on how safety leadership has changed since COVID?

Survey participants were invited for interview. The interview consisted of four questions seeking to understand the factors that were influencing the types of intervention reported as implemented/changed in the survey. These questions were:
- In general terms, do you believe COVID had impacted on safety leadership interventions within the rail sector?
- What safety leadership interventions are the most impactful in a post COVID world, and why?

- Have there been any benefits of COVID in terms of safety leadership, and if so, what are these?
- What do you believe the biggest challenges to safety leadership are in a post COVID world?

Seven participants agreed to be interviewed. An online interview was carried out at an agreed time. Confidentiality and anonymity of information provided was maintained during this process. No findings from previous interviews were discussed with other participants.

The results were analysed in two parts: survey and interviews. A comparison of the data with the specific intervention questions was undertaken (questions 1 to 23). In addition a thematic analysis approach was taken to analyse the content from the survey (questions 24 to 26) as well as the interviews based on the checklist of Good thematic análisis identified by Braun and Clarke (2008). The steps taken during the analysis are listed below.
- Data familiarisation
- Initial coding
- Establishing themes
- Review of themes against literatura
- Analysis conclusions including relevance of themes

Both elements of the analysis were evaluated in relation to the impact of COVID on safety leadership interventions.

RESULTS

This study has recorded the current status of safety leadership intervention post-COVID through the use of survey and interview amongst representatives from the UK Rail Infrastructure sector.

Table 1 presents the results for the deployment of each safety leadership intervention in the post COVID world, showing comparison with the interventions prior to COVID.

Intervention Type	Did not use before or after COVID	Did use before COVID but not now	Use less since COVID	Use the same as before COVID	Use more since COVID	Did not use before COVID but do now	Not sure
SHELT or equivalent			2	11	2		
Site leaders call (weekly)	3		1	7	4		
Safety objectives within appraisals				12	3		
Safety leadership tour			3	9	3		
Worksafe procedure	1			11	3		
Back to the floor	2		2	6	3		2

Prompt intervention (immediate on site)				12	2		1
Mindful leadership	1			5	8	1	
Follow up on investigations				15			
Stand down/Step up/open day events			1	11	3		
Safety forums/committees (workforce)			1	12	2		
Safety forums/committees (supervisors)			1	10	2		2
Observation/close call/near miss cards			2	12	1		
Reward schemes	3		1	9	2		
Use of fair and just culture tools				12	2	1	
Behavioural based safety programmes	1			10	4		
General safety training			1	10	4		
Safety briefings (RAMS, SSOW, TBT etc)				15			
Leadership deliver safety briefings			1	11	3		
Safety moments			1	9	5		
Site safety audits/inspections			1	13	1		
Totals	11	0	18	222	57	2	5

Table 1: Safety leadership interventions: status post COVID

Most of the safety leadership interventions were used the same since COVID as they were previously. Many of the interventions are also reported as being used more since COVID, especially mindful leadership, safety moments and behavioural based safety programmes.

There were some interventions where participants reported less use since COVID; safety leadership tours in particular, but also SHELT, back to the floor and observation/close call/near miss reporting.

The analysis has also identified a several themes for each of the questions posed during the survey and interviews. Each of these are detailed within Tables 2 to 4.

In general terms, do you believe COVID had impacted on safety leadership interventions within the rail sector?

The study has identified that COVID was reported to have an impact on safety leadership interventions. There were three themes evident the analysis; impact dependent on role, engagement, hygiene and welfare. Each of these are outlined in the Table 2 below.

Theme	Description
Impact role dependent	Little/no operational impact from COVID on frontline leadership, as Project work did not stop, operational leaders continued to be primarilly based on site and continued with safety interventions as previously.

	Senior level reported impact from having to engage differently with their workforce, in particular where large gatherings of people were prohibited.
Engagement	Difficult to engage in the pre-covid ways due to social distancing, hybrid and remote working and people being reluctant to be in large groups.
	More engagement with workforce due to increased briefings, consultation and general communication about the regular changes to site COVID protocols.
	More engagement with the supply chain to understand changing methodologies to comply with site COVID protocols.
Hygiene & Welfare	Higher higiene standards and cleanliness than ever before.
	Higher standards of welfare provision and more frequent inspections in place.

Table 2: Themes for impact of COVID on safety leadership interventions

What safety leadership interventions are the most impactful in a post COVID world, and why?

The analysis shows that there is a greater recognition for the importance of face to face communication since COVID. All participants identified that there is no substitute for personal interaction. Whilst it was recognised that leaders had to adapt to alternative methods of engagement e.g. online briefings, participants state that any intervention that involves leaders being visible has more impact. Therefore any of the pre-determined interventions (as listed in Table 1) that are conducted physically in person are more effective. It was also stated that it has taken some time for senior leaders to adapt to the relaxation of COVID restrictions and return to the same levels of frequency of occurence for previous interventions, such as safety leadership tours.

Have there been any benefits of COVID in terms of safety leadership, and if so, what are these?

The study has identified five areas of safety leadership interventions which have benefitted from COVID. Each of these five areas are enablers for good safety leadership interventions. For example, leaders embracing technology has provided a mechanism to facilitate engagement during the pandemic and beyond into new ways of working. Each of the five themes are outlined in the Table 3 below.

Theme	Description
Hygiene	More focus on personal hygiene than before, with the accompanied investment from leaders (time, resources and money).
Self-awareness	COVID generated a higher level of self-awareness and the impact of personal behaviour on others e.g. families. Opportunity for leaders to build on this in relation to workplace safety-related behaviours.
Embracing technology	Organisations/individuals have had to adapt to new technologies as a means of communication.

Mental Health & Wellbeing	Unprecedented focus on mental health and wellbeing, understanding the impacts of stressors (work-related and other) on individuals behaviour at work
Leadership Focus	COVID initiated leaders to focus on engagement with their teams at a level not previously experienced.

Table 3: Themes for benefits of COVID on safety leadership interventions

What do you believe the biggest challenges to safety leadership are in a post COVID world?

It is important to note that half of the participants reported that the challenges to safety leadership remained the same as before the pandemic, but COVID has exacerbated these due to a shrinking workforce, changing attitudes and societal expectations.

It was also stated *"As an industry we came together to address one particular problem (COVID), and keep people working under the restrictions. There were consistent rules for all, even in deployed differently. If the industry could come together the same again, what else could we improve"*. This is an interesting observation giving a general indication about the wider industry culture and approach to sharing and learning.

There are five themes identified as challenges to safety leadership interventions, which are detailed in Table 4.

Theme	Description
Learning	We need to learn and share better, as individuals, within organisations and across the industry.
Expectations	The expectations of the workforce have changed since COVID with a greater demand for flexible working and more priority given to work/life balance than previously.
Workforce Mindset	There has been a change of mindset to health and safety at work with greater priority given than previously. How can leaders encapsulate this for the wider improvement of safety at work?
Leadership Skills	Developing leaders to enable flexible work approaches, and respond to unpredictability and uncertainty, whilst still being visible at the workface.
Maintaining new standards	The focus of leaders should be on maintaining the achieved improvements since COVID, and not allowing standards in hygiene, communication etc to slip.

Table 4: Themes for challenges on safety leadership interventions – post COVID world

CONCLUSION

The combination of the pandemic and safety performance coincides with safety and health in the workplace being given a high degree of attention rarely experienced by those in leadership positions.

COVID has been a catalyst for a greater focus on mental health, stress and wellbeing in relation to those at work. Leaders have needed to respond to this, developing their knowledge and skills in order to demonstrate clear leadership commitment.

Indeed it is considered that the pandemic has contributed to some benefits for safety leadership largely due to the imposed greater focus on safety and health than ever before. Since COVID started there has been greater investment of leaders time, resources and money into health, hygiene and safety practices as required under the UK legislation and industry specific COVID Safety Protocols.

Not only has there been an external driving force contributing to this change, but also a change of expectations from the workforce for flexible working, higher importance of hygiene standards and workplace controls, and more frequent communication and engagement with leaders. This has also been identified as a challenge facing the industry: further evolving safety leadership interventions in order to continue meeting these demands.

Safety leadership tours have largely continued through the pandemic, although at a reduced frequency. These remain an important activity for leaders of safety. There has been more Mindful Leadership and Behavioural Based Safety interventions since COVID, which may be attributed to more attention being given to the mindset of individuals and the implications of stress and poor mental health for those at work.

This study has found that demonstrating visible safety leadership in physically in person is more effective than via other mechanisms e.g. online. Stiles et al (2021) also recognised the importance of role of safety leadership in the pandemic. As time has moved on into a post-COVID world, we are now in a position to understand that demonstrating commitment, building relationships, face to face engagement, presence on site and leaders being able to exhibit and reinforce safety behaviours are important for all leadership interventions. Developing leadership skills further will support leaders in deploying flexible work approaches, and respond to unpredictability and uncertainty, whilst still being visible at the workface.

This study has identified that there are numerous safety leadership interventions being deployed within the rail infrastructure sector, some of which have been changed and adapted since COVID. Technology has a role to enable effective communications, in balance with effective face to face engagement.

The need to learn, at a individual, organisation and industry level, has been identified as an area for further development, and one where leaders can really drive safety improvement working together to achieve a common shared goal.

This study provides an early indication of safety leadership interventions within the UK rail infrastructure sector. A potential study limitation is the low number of participants within the study (n15). However, further data collection has taken place beyond the scope of this study in which the feedback is consistent with that received from participants in this study. In further studies it would be worthwhile increasing the participants numbers.

This study concludes that well-established approaches to safety leadership may be worthy of a review in light of the pandemic and the challenges and opportunities for leaders of safety within a post-COVID world.

Keywords: Safety leadership; rail; infrastructure project; COVID

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