Strategy for regulation of health and safety risks - chapter 8: Workforce safety

The headline statistics for mainline workforce safety indicate reasonable performance, but also highlight an underlying risk of harm. Whilst in some risk areas duty holders are doing all that is reasonably practicable, in others, such as track worker and electrical safety, continued effort is needed to close the risk gap.

A zero workforce fatalities goal remains realistic and is sustainable. To achieve this there must be better infrastructure design and improvement in planning and organising work, in particular for track workers.

ORR priorities in worker safety

ORR will continue to encourage:

- Where achievable, the elimination of open line (Red zone) working or, with wider take-up of initiatives such as 'safe and effective' worksites. This will involve greater use of technological means, such as plain line pattern recognition and remotely operated protection devices.
- Safety improvements in yards, depots and sidings, in particular in relation to electrical and fall risks
- Continued industry attention on reducing road driving risk

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Introduction

1. The headline statistics for mainline workforce health & safety indicate reasonable performance; 2015-16 saw no workforce fatalities, but showed an underlying risk of harm.

2. Improved worker health & safety can contribute to business efficiency, for example through planning standardised track work possessions instead of working red zone with lookout(s) . The economic, as well as the safety, case for change should be used to the full. Early safety by design interventions are a valuable means to secure infrastructure improvements.

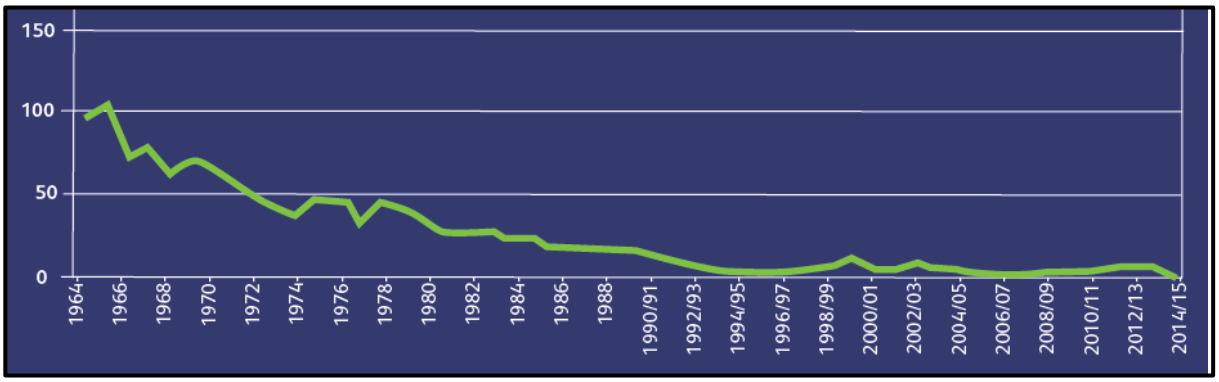
Legal duties and the role of ORR

3. Employers, employees, directors, suppliers, owners of premises and others have duties under the Health & Safety at Work etc. Act 1974 to ensure, so far as reasonably practicable, the safety and health of those at work. It is ORR's role as the safety regulator to encourage compliance with the law through a variety of means, from advice through to enforcement, whilst keeping safety representatives properly informed.

Historical trends

4. The long-term trend in workforce fatalities has shown a notable improvement over the past 50 years, as the following graph shows. Workforce fatalities exceeded 100 per year in the early 1960s, but are now in the region of 1-3 per year (zero in 2015/16). The improvement is due to various factors, including:

- A general move away from unsafe, labour intensive working methods, in favour of more mechanised processes.
- Technological and operational improvements, which have reduced maintenance requirements and helped to create better working conditions.
- The effect of health and safety legislation, compliance with it and changing attitudes to the acceptability of workplace death and injury.



Extract from RSSB ASPR 2015-16 (Trends in public fatalities are mainly trespass and suicide)

Current position (National Network and LUL)

5. Based on RSSB's Annual Safety Performance Report (ASPR) for 2015/16 for the mainline railway, the table below gives a summary of the reported harm to the mainline railway workforce. In the year 2015/16 there were no workforce fatalities. (In 2014/15, two workers were fatally injured in road traffic accidents and one was electrocuted in a third rail depot.) The Fatalities and Weighted Injuries (FWI) score places a 'value' on the large number of non-fatal incidents in order to present a picture of the overall harm. Encouragingly, when taking into account a 3% increase in the total number of hours worked, the decrease in FWI from 2014/15 to 2015/16 represents a 21% decrease in the normalised rate of harm. This is a very welcome development after higher levels in each of the previous nine years. It should be noted, however, that figures for 2015/16 are only a fraction lower than those for 2006/07.

	Total workforce incidents (mainline)		
Period	**2013/14**	**2014/15**	**2015/16**
Fatalities	3	3	0
Major injuries	177	182	157
Minor injuries	6203	6136	5694
Shock/trauma	1024	833	746
FWI	32.4	32.3	26.2

6. There have been no workforce fatalities on London Underground Limited (LUL) in the last 19 years and the numbers of both major injuries and reportable 'over 7 day' incidents are low. Taking into account the smaller LUL workforce, compared with the main line, the headline statistics suggest LUL performance to be notably better than that of the main line.

7. Reasons for LUL's good performance are likely to include routine night time maintenance with neither trains nor traction current and a geographically compact network.

Recent serious incidents have served as a reminder, however, that there is no room for complacency and that continued diligence is needed.

8. The Safety Risk Model (SRM), developed and maintained by the Rail Safety and Standards Board (RSSB) for the main line, provides a stable estimate of the underlying level of risk from different sources. It aims to model risks and trends, and is resistant to the effects of chance fluctuations in the occurrence, (or not) of low numbers of the most serious incidents. Note that the modelled level of workforce risk under SRM (33.4 FWI) is higher than the actual FWI total for the year 2015/16 (26.2FWI).

9. Nearly two thirds of all 'harm' to the workforce, under the mainline safety risk model, is accounted for by a large number of 'slips, trips and falls', 'contact with object' and 'other' accidents. Sector by sector, nearly a third of harm occurs to those working on trains and in stations. A similar share of overall harm is suffered by infrastructure workers. Nearly a quarter of harm occurs in yards, depots and sidings, the main contributors being slips, trips and falls, contact with objects and electric shock.

10. When it comes to fatality risk, there is an underlying level of risk attributed to staff being struck by a train, even though there have been no such incidents since January 2014

(Newark Northgate). We know from experience that most workforce fatalities, including those caused by being hit by a train, occur among infrastructure workers. Since 2004/05, there have been 28 workforce fatalities, 20 of whom were infrastructure workers. Infrastructure workers also dominate the major injury figure; since 2004/05, nearly 60% of major injuries have occurred in this group.

Comparison with other industries

11. 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. Infrastructure workers appear to be exposed to a level of risk that is lower than road construction operatives, and plant and machine operatives, but greater than mobile machine drivers, telecoms engineers and other engineering professionals. However, there is a substantial element of uncertainty in the estimates for non-rail workers, due to differences in data quality.

Welfare

12. ORR routinely checks welfare arrangement at fixed and transient sites. Specific consideration for transient worksites include: the nature of the work, hazardous substances and the adequacy of washing facilities.

Britain's performance in the European context

13. Workforce fatality and serious injury rates in the UK are well below the EU average. They fall well within the National Reference Value (NRV), expressed in terms of Fatality and Weighted Serious Injuries (FWSI) per billion train kilometres. In the area of workforce safety, the UK is currently ranked third out of 25 EU nations. (The UK is ranked first in the areas of passenger and level crossing safety.)

Challenges to good safety performance

14. In an industry that is continually throwing up new challenges and opportunities, the law requires duty holders continually to strive to take all reasonably practicable steps to ensure safety and health. Headline safety performance has been fairly static in recent years, and ORR, in line with its zero fatalities goal, contends that standing still is not an option. Complacency is dangerous and is, perhaps, one of the main challenges to be overcome.

15. Other challenges include the need for stronger forward planning, safety by design and the realisation of economic efficiencies, which can go hand in hand with safety advances. Specifically funded projects in Network Rail's five-year financial determinations can and do support a number of safety improvements. Opportunity to build further plans into Control Period 6 and to have early influence in train operator franchising competitions should not be missed.

Targeting ORR input on key risk areas

16. ORR activity is targeted at various key worker safety risk areas in proportion to the overall level of harm that each poses. This simplistic allocation of resource is modified by consideration of additional factors such as:

- The risk gap: more resource is directed to areas where performance falls well short of established and achievable standards, less where performance is at or close to the 'all that is reasonably practicable' mark.
- The likelihood of death or serious injury when considered within the overall harm figure. More resource may be directed to areas where incident consequences are likely to be the most serious.
- Trends in safety performance: declining performance in any one risk area is likely to attract more ORR resource; an improving picture is likely to attract less.

ORR priorities in worker safety

Track worker protection

17. Nationally, many Network Rail maintenance delivery units achieve around 70% green zone working, rising to near 100% in Scotland. Much of this work, however, relies on signal protection only and is subject to the susceptibilities that this brings. In the LNE Route, Network Rail's 'safe and effective' worksites initiative aims to pack routine maintenance work into standardised possession blocks, thereby reducing live-line working and making work more predictable, efficient and productive. This initiative is showing good promise and ORR is very keen that this good practice spreads to other routes.

18. ORR is also keen to see greater use of technology to reduce the need for red zone working, through innovations such as:

- Plain line pattern recognition technology, which can significantly reduce the need for red zone track patrol activity
- The remote disconnection device, which is a quick means of securing additional protection for track workers by keying a signal to danger
- The negative short circuit device, which can greatly speed-up isolations (thereby making possessions more productive) and eliminate staff exposure to risk

Track worker warning systems

19. ORR has continuing concern about the reliability and inefficiency of some warning systems that remain in use. The semi-automatic track warning system (SATWS) system is useful in the short term, but is expensive. The 'tactical' (short term) signal controlled warning system (SCWS) currently under development shows promise and should become available in 2017. This can provide an efficient and very reliable warning for work in the vicinity of adapted location cabinets.

20. The above are short term, partial, solutions. Network Rail's 'strategic' (long term) SCWS will aim to offer a consistent national warning system; similar to a system used in Austria, but this is some years away from completion. ORR has had sight of the early stages

of this project and Network Rail is expected to make a bid for financing this in the next control period.

21. ORR recognises that some open line working will continue in the immediate future, and encourages the wider use of reliable and efficient warning systems such as SWCS.

Yards, depots and sidings (particularly those with conductor rail)

22. ORR notes that these locations are often of old design and, in some cases, in need of an increased level of maintenance. They are, however, places of routine work activity where staff are required to work in close proximity to trains and, in some cases, live conductors. The causes of harm are dominated by slip, trip and falls, though other areas of concern include conductor rail electrical safety and, inevitably, shunting. To help focus industry action, ORR has produced a safety principles document on means to avoid electrical and fall risk in train servicing work.

23. ORR will inspect and enforce, on both train operators and the infrastructure manager/property lessor, to secure improvements. We will engage with franchising authorities to ensure that any necessary safety improvements are made known to potential operators. Lack of space is a common issue in sidings and depots and, with this in mind, land disposal proposals will be considered carefully.

Work-related road safety

24. The risk of an accident or incident involving a member of staff arising from work related road travel is one of the main contributors to worker death or major injury. Industry awareness has certainly grown and efforts to avoid excessive fatigue are made, though a level of risk remains. Extensive guidance on fatigue and road risk has been produced by RSSB and ORR. ORR will remain vigilant and take action in cases of clear mismanagement of fatigue or other factors contributing to road risk.

25. The following table sets out the main risk areas affecting railway staff, ranked in order of their FWI contribution.

ORR risk priority areas (in order of contribution to SRMv8.1 modelled mainline risk, Annual Safety Performance Report 2015/16)

Risk areas	Background information	Industry action	ORR action
Slips, trips and falls 10.1 FWI	Taking into account the large numbers of non-fatal incidents, this risk area is by far the largest single contributor to workforce harm, affecting those in all workforce sectors. There has been some fluctuation in levels of harm in recent years, but no clear trend to sustained improvement.	Initiatives, including clearing the cess, maintaining safe walking routes and improving line-side access points continue. Across the extensive network there remain, however, many areas where slip, trip and fall risks persist, sometimes well below achievable standards.	ORR action will be focussed on areas where the risk gap is greatest, for instance line-side, in depots, sidings and yards, where ground conditions, access routes and illumination are likely to be the most challenging. Action should be based on intelligence such as numbers at risk, incident and condition reports, the potential hazard and the perceived risk gap.
Contact with object 5.4 FWI	This category covers a range of bodily injuries caused through contact with objects large and small that might, for instance, be sharp, heavy, hot, crushing, etc. We currently see no clear trends for sustained improvements	Established measures taken by industry include training, safe methods of work, PPE and segregation of personnel from potentially harmful operations.	Though rather a general injury-type classification, ORR will identify and act upon activities likely to cause bodily harm, particularly to those in the 'on-board train or in station', 'infrastructure workers' and 'yards, depots and sidings' categories, where the risk gap is determined to be wide.
On-board injuries 2.8 FWI	Incidents include assault, falls (separated out from slips, trips and falls, above) and catering incidents.	Much work has been done in the TOC community to control risks. There has been a gradual overall reduction in harm caused over the last ten years.	ORR continues to monitor performance. Risk gap likely to be low.
Platform-train interface 2.5 FWI	An issue for staff, as well as passengers, influenced by infrastructure and rolling stock characteristics and working practices.	There has been notable action by TOCs in line with the industry's PTI initiative. There is, however, no clear trend to improvement shown by incident statistics for the past ten years.	This area from a workforce point of view will continue to receive ORR attention due to the potentially serious harm that can arise. Risk may increase as passenger numbers on platforms rise.

Risk areas	Background information	Industry action	ORR action
Struck by train 1.9 FWI	Though currently in a welcome pause in deaths to track workers through being struck by trains, underlying risk remains. The consequences of such incidents are usually death or serious injury. Though not by some way the main cause of overall harm to infrastructure workers, this area dominates in terms of the most serious consequences.	This has progressed over the years, with less labour intensive working and established safe working procedures. Full use of robust and reliable protection and warning systems remains some way off, however. Some piecemeal innovations are being developed, and efforts to revise track working arrangements have been trialled (PDSW) with mixed success. In the medium to longer term, full consideration of track worker safety needs must be designed into signal controlled warning systems and ERTMS.	This area will continue to attract ORR attention because of the likelihood of serious outcomes, the numbers of people affected and, in some cases, an appreciable risk gap. ORR wants to see effective planning and organising to achieve high levels of green zone working or, where appropriate, the use of reliable and efficient methods for train warnings.
Assault and abuse 1.8 FWI	This is an ever-present risk for passenger-facing staff on an ever-busier railway	Good industry action continues to be taken in the areas of training, publicity and the prevention of ticketless passengers boarding trains. On some services, alcohol has been banned. In the last ten years harm through assault has shown a general decline of somewhere in the region of a third.	Continued ORR scrutiny of risk controls and trends, acknowledging progressive initiatives by industry.
Road traffic accidents 1.3 FWI	Four rail staff have died as a result of road traffic accidents during the period 2013-2015 – more than the SRM predicted long-term level. Fatigue was a very likely factor in two of these incidents. Road risk is one of the main current contributors to worker death or injury.	Industry awareness has grown and we now see more effort to take account of travel time and to influence staff selection and travel choices. There is likely to be a lesser degree of control amongst some contractors, where travelling long distances can be the norm.	Extensive guidance on fatigue and road risk has been produced by RSSB and ORR. ORR remains vigilant and will take action in cases of clear mismanagement of fatigue or failure to tackle other factors contributing to road risk. See strategic chapter on occupational health.

Risk areas	Background information	Industry action	ORR action
Train accidents 1.1 FWI	This grouping covers a range of harm that can result from RIDDOR defined train accidents. The risk is principally to the driver.	Much has been done to prevent the most serious train accidents, but trains running into or striking obstructions or buffer stops, or incidents during permissive working remain a concern.	The potential consequences of train accidents, taking into account passenger numbers, are serious. The risk gap, for instance in the case of striking obstructions, certainly has some way to be closed, through measures such as ground stabilisation, vegetation management and improved fencing.
Falls from height 0.6 FWI	This risk area is mainly associated with infrastructure workers. Performance shows some sign of improvement over the last five years, though three major injuries were recorded in 2014/15.	There is undoubtedly much effort put into safe working at height, both in the maintenance and infrastructure projects area, but there continues to be a small number of wholly avoidable accidents.	ORR will continue to monitor maintenance and construction activity; the consequences of an incident can be serious and the risk gap is closed through reasonably practicable means.
Electric shock 0.5 FWI	Observed standards in both the third rail and overhead electrification systems often fall short of Electricity at Work Regulations requirements. Concerns include safe means for taking isolations and work in the vicinity of live un-insulated conductors. Given the scale of infrastructure hazards, the fact that there are not many more serious incidents is a reflection of staff diligence in following procedures for work in imperfect conditions.	The industry has suffered from the perpetuation of out-dated equipment and working practices, though, with significant ORR input, matters are showing signs of improvement, for instance	Considerable effort in recent years has gone into influencing positively design decisions for new overhead electrification infrastructure, to comply with the relevant Regulations. This input will continue ORR has inspected NR, the affected TOCs and TfL, and has produced a 'principles' document on safety in train servicing work. We will continue to engage with franchising authorities and the industry to encourage compliance with the Electricity at Work Regulations and other regulatory requirements.

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