OFFICE OF RAIL AND ROAD

Annual Report of Health and Safety on Britain's Railways

14 July 2022

Contents

Chief Inspector's Review

We continue to benchmark the safety performance of our railways, and our health and safety regulation, wherever possible, and I was pleased to welcome ORR's publication of the Common Safety Indicators Report which shows that Britain's railways were one of the safest in Europe. More recently, the Rail Safety and Standards Board (RSSB) Precursor Indicator Model (PIM) showed risk on the mainline railway at an all-time low. We remain alive to the emerging trend across our non-mainline sectors.

As Coronavirus (COVID-19) restrictions eased during the year, my team at ORR worked hard to ensure the industry remained focused on good health and safety practice; providing advice, guidance and support across all sectors (mainline, metro railways, heritage and trams), adjusting our own working practices to ensure we remained available and productive throughout. Industry continued to demonstrate an agile and collaborative approach that saw them respond to new COVID-19 guidance and evidence of risk, and adapt timetables and procedures effectively and at pace.

The need to remain focused on delivery by the industry of "the day job" of a safe, operational railway was evident. For example, we saw an increase in low-level health and safety events and significant incidents, such as the Fisherton Tunnel derailment near Salisbury in October 2021, which could have had much more serious consequences. Incidents such as this one prompted me to write to the industry in December 2021 setting out my concerns, reminding them to maintain safety standards and to ensure they were focused on controlling risks and management at all levels, especially front-line assurance.

Working with industry to deliver health and safety improvements

My report details the extensive work we have undertaken across the year to support industry in delivering health and safety improvements.

Mainline railways

We have for a long time stressed the need for improvements to the management of earthworks and drainage, dating back before the fatal accident at Carmont in 2020, when a passenger train collided with debris washed onto the track. There are early encouraging signs that national strategies to better manage these risks are working although it is too soon to say whether this has, in some part, been driven by the nature of recent severe weather. These storms have, however, exacerbated a persistent but stubborn area of

concern in Network Rail's management of vegetation clearance, a driver of the adverse trend in objects on the line.

There has been impressive work on track worker safety, and an admirable 98% reduction in red zone unassisted lookout working since July 2019; this year there were no track worker fatalities on the mainline railway. The moving annual average (MAA) of track work related near-misses fell by 70%, although these incidents continue and ongoing vigilance is required to further drive numbers.

Level crossings continue to be a major source of risk on the railway. The moving annual average for all level crossing events had worsened by 15.9% by the end of the year and fatalities at crossings worsened considerably. There was a total of seven level crossing fatalities over the year. This is three more than last year and two more than each of the preceding years.

In June 2021 as part of our continued commitment to improving level crossing safety we launched our new Principles for managing level crossing safety guidance to drive better collaboration between those involved in managing level crossings and highways, and place a greater emphasis on understanding level crossing users. We also made it easier to make improvements at crossings, without the need for a new level crossing order.

There were two workforce fatalities in the year; in January 2022, a fatal road traffic accident to a Network Rail employee near Bury St Edmunds and in February 2022 a train driver, who was struck and killed by a train after he left his cab, which we are currently investigating.

In May 2021, the Hitachi Class 800 trains were withdrawn from service because of cracking in the vehicle bodies. We reviewed the operators' risk assessments for managing the return of trains to service and found robust challenge of Hitachi, as part of the operators' assurance. We conducted a review of safety lessons around the incident, and found excellent collaboration in managing the withdrawal of trains from service and developing safety criteria to allow trains to be reinstated.

The greatest fatality risk to passengers using the network remains the Platform Train Interface. Typically, harm to passengers and the public in stations represents just over a third of total accident risk. Aside from our inspection activity, we drive improvement through our active involvement with industry collaborative groups, such as the Rail Delivery Group's (RDG) Passenger Operators Safety Group, RSSB's People on Trains and Stations Risk Group and the Train Accident Risk Group. In this way, we have been assured the sector is acting on emerging risks such as the use of mobility scooters on platforms. We have brought the sector's attention back to the important work of reviewing the RSSB Platform Train Interface risk assessment tool, as well as undertaken further inspections around Platform Train Interface management. We have also investigated accessibility issues at stations and our action has led to improved provisions for step-free access.

As the freight sector continues to recover from the impacts of the pandemic, our proactive work looked at the industry's arrangements to control train accident risk, with specific inspections examining the management of Signals Passed at Danger (SPADs) and rolling stock asset condition. We also completed a targeted inspection programme that looked at how freight operating companies (FOCs) ensure that mobile staff are provided with access to welfare facilities.

Enforcement and prosecution is only one of the tools we use to drive improvement and excellence in health and safety management and risk control. We strive to encourage excellence, but use enforcement tools to ensure duty holders take immediate action to deal with serious risks and make improvements so that they meet their legal obligations. This also includes ensuring duty holders are held to account in the courts for any health and safety failings that merit prosecution. For example, in July 2021 WH Malcolm Limited, the operator of Daventry International Rail Freight Terminal near Rugby, received one of the largest fines levied in a health and safety prosecution - £6.5m - after being found guilty of negligence over the death of an 11-year-old boy in 2017. This case reiterated the importance of managing trespass and maintaining effective boundary fences after the boy was able to easily gain access to the depot with his friends to retrieve a football. The £6.5 million fine was upheld by the Court of Appeal in April 2022.

We continue to review and refine our relationships and approach to regulating across our borders, following the UK's exit from the European Union. We provide leadership, expert advice, and secretariat support to the Inter-Governmental Commission (IGC) and supporting Channel Tunnel Safety Authority (CTSA). The CTSA monitored Eurotunnel's approach to safety-related issues in respect of its new ElecLink HVDC interconnector project and provided a level of assurance to the IGC that enabled consent for commercial operation to be granted. We continue to support the Department for Infrastructure in Northern Ireland with expertise and resource support to enable effective regulation in Northern Ireland and across the border.

Tramways

We conducted a review of the Light Rail Safety and Standards Board (LRSSB), concluding that LRSSB is definitively adding value to the industry. LRSSB is already providing invaluable guidance and tools to improve understanding of risk in this sector as it grows in scale and experience. Our conclusions, together with some specific recommendations, helped to secure funding for the continued operation of LRSSB for the next three years at least, underpinning its continued development and stability as an authoritative and credible safety and standards body.

The creation of LRSSB was in large part instigated by the investigations into the Sandilands fatal tram accident in November 2016, and the completion of the investigation into the incident has now allowed us to instigate proceedings against the companies and individuals involved.

Heritage railways

We continued to engage across the heritage sector in order to maintain and increase its management of risk. This is particularly important as railways recommenced operations and the sector's ongoing recovery from the impacts of the pandemic restrictions. Whilst it was reassuring that our inspections continued to find that individual railways were making progress to address gaps in their safety management systems, we did identify some significant shortcomings through our inspection and investigation work.

Challenges ahead

As I have done in recent years, I also see my Annual Health and Safety Report as an opportunity to set out what I consider to be main themes and areas of challenge for the industry in the year ahead. I have four:

1. Managing the legacy impacts of the pandemic

As the country returns to work, leisure and travel, rail plays an important part in the nation's recovery from Covid. We are already starting to see passenger numbers increase, albeit with shifts in travelling behaviour from commuter to leisure travel.

An increase in services, passengers and freight means an increase in risk. The railway needs to be ready, building up safety management activity that has been constrained due to Government restrictions and staff absence. For example, competency management, training and assessment, and frontline assurance. To support this, rail leaders need to improve communications throughout their organisations, listening to and supporting frontline staff. This is even more important in order to safely manage the organisational changes planned to meet the financial constraints associated with national recovery. At the same time, the industry must strive to maintain, where possible the few positive changes as a result of the pandemic restrictions, including better network performance, less crowding, and a cleaner passenger railway.

2. Managing change: safety by design and successful, safe transition

Reform of Britain's railway will require enormous change, presenting opportunities, but also threats, to effective safety management. We will support the transition to Great British Railways (GBR) working with all parties including government, Network Rail, the Rail Safety and Standards Board and the Train Operating Companies (TOCs).

It will be challenging, but imperative, that the transition is achieved whilst maintaining frontline assurance and striving for excellent health and safety management every day. We need to ensure that everyone maintains focus on the day job and that the health, safety and wellbeing of passengers, the public and the workforce remains at the heart of how the railway operates now, and at every step of the process of reform.

Equally, I will ensure that my teams do not allow planning and delivery of change to be a distraction from crucial frontline activities, such as health and safety inspection and enforcement, authorisations and approvals, and holding the rail industry to account on its commitments.

3. Supporting people

People is what the railways are all about, getting people and their things where they need to be safely and on time. People doing the right things well is key to operating a safe railway every day, just as they did during the pandemic. Industry change, financial constraint and even industrial action will create unsettling times for the workforce, including managers. Effective organisational change management, job design and workload planning, will be essential.

Momentum must continue on improving health and wellbeing. We expect continued commitment to industry initiatives to gather better health risk data, the foundation of better health management. We also welcome the introduction of state of the art clinics to support significantly improved occupational health management for the whole mainline sector. Once again ORR will be supporting Rail Wellbeing Live in November 2022, building on the success of last year's conference.

4. Implementing technologies effectively

New technology has the potential to offer real improvement in weather prediction, earthworks management, worker protection, level crossing protection and traction power control, but these systems need to be introduced using good safety change validation, involving users and human factors expertise, with well-implemented supporting business processes.

Going forward

ORR will play an active and important role in supporting government and industry through the design and transition to Great British Railways (GBR). We will ensure clear roles and accountabilities for the change and in the new structure, as well as taking the opportunity to design out risk where possible. We will also gather and share key intelligence through our planned activities during transition, to ensure safety is maintained and improved where practicable. As part of this, our work to assess safety improvement plans included in the 2023 periodic review will ramp up over this year, ahead of our review of Network Rail's business plans in early 2023. Because of the timing of the planned reform of the industry, this periodic review will determine the regulatory framework and funding for the mainline rail infrastructure through the design, transition and first five years of GBR.

In the heritage sector, ORR will continue to push leadership, succession and operator capability, collaborating with the Heritage Railway Association (HRA) on the delivery of common standards. This sector has suffered financially during the pandemic and it is essential that competences are high and all assets are fit to run as they re-open. The

assurance role ORR plays on the safety of rolling stock and infrastructure across the whole of the industry will be particularly important.

We will promote health and safety by design during the development of new lines (such as HS2, the Trans Pennine Route Upgrade and smaller schemes) and will encourage the use of the Better Value Rail toolkit (intended to support sponsors of transport projects in the early stages of development make better decisions earlier, identify the right transport solutions, and save time and money in the longer term). A shift to new types of technology, including increasing use of safety critical software in new trains, will be the subject of inspection work. We will continue to support the industry's strategic plan for electrification to support the government's decarbonisation policy and the elimination of diesel from the network.

As climate change adaptation and weather resilience rise up the agenda, we will continue to address the management of extreme weather and flood risk with industry, to identify high hazard areas and put mitigation in place. Following publication of the Rail Accident Investigation Branch (RAIB) report into the 2020 Carmont derailment, a focus for the forthcoming year will be to follow up RAIB and other related recommendations for Network Rail, and to conclude our own investigation in the first half of the year.

We will drive improvement in our own performance, through internal processes, including the development of an auditable competence management system for staff. We will make better use of evidence of risk management to support enhanced targeting and planning. We will also lead a piece of work across the health and safety regulators to better support innovation in our sectors and our own working methods.

The last twelve months proved to be a further challenging year for all in the railway family and we can look ahead to a period of change and reform that will impact the whole sector in some way. We will continue to work closely with industry and government to provide valuable support and advice and strive to see continuous improvements in health and safety management across the industry, for the benefit of all. As I write this foreword, passenger services have commenced on the Elizabeth line, representing the conclusion of almost 10 years of work by industry and ORR colleagues, and the significant milestone of the first new railway in many years, offering new journey possibilities.

Ian Prosser CBE
HM Chief Inspector of Railways

1. Health and safety across the railway sector: The regulator's view

Introduction

1.1 In this section we provide an overview of our main findings across each of the railway sectors that we regulate, setting out key risk areas and the effectiveness of their management. We set out the evidence supporting our conclusions, including (where appropriate) the results of our Risk Management Maturity Model (RM3) assessments.

1.2 RM3 is one of our key health and safety assessment tools. It measures an organisation's ability to manage risk maturely and achieve excellence in risk control. It looks at the areas of policy, monitoring, audit and review, planning and implementing, securing co-operation and confidence and organising for control and communication. It uses a five-level scale to assess performance and identify areas for improvement:

(a) **level 1 'ad-hoc':** processes are typically undocumented and in a state of dynamic change, tending to be driven in an ad-hoc, uncontrolled and reactive manner by users or events. This provides a chaotic or unstable environment for the processes.

(b) **level 2 'managed':** some processes are repeatable, possibly with consistent results. Process discipline is unlikely to be rigorous but where it exists it may help to ensure that existing processes are maintained during times of stress.

(c) **level 3 'standardised':** there are sets of defined and documented standard processes established and subject to some degree of improvement over time. These standard processes are in place (i.e. they are 'as-is' processes which define the current state of the business process in an organisation) and are used to establish consistency of process performance across the organisation.

(d) **level 4 'predictable':** using process metrics, management can effectively control the 'as-is' processes. In particular, management can identify ways to adjust and adapt processes to particular projects without measurable losses of quality or deviations from specifications. Process capability is established from this level.

(e) **level 5 'excellence':** there is a focus on continual improvement of process performance through both innovative and incremental technological changes/improvements.

How ORR assesses harm and risk performance

1.3 The collection of good data from across Britain's railways is critical in order to:

(a) identify trends and quantify risk;

(b) set the correct risk control priorities; and

(c) measure performance.

1.4 We use industry information about actual harm and modelled risk to measure health and safety performance on Britain's railways:

(a) **actual harm** caused to individuals, which is measured using the fatalities and weighted injury index (FWI).

(b) **modelled risk**, which uses historic data to periodically quantify the frequency and potential average consequence from a particular set of circumstances that could lead to a safety incident. The RSSB Safety Risk Model (SRM) periodically takes a snapshot of all significant risks on the mainline and their monthly PIM tracks trends in key catastrophic precursor train accident risk. London Underground (LUL) and the tramway sector use similar approaches with sector specific safety risk models.

1.5 However, these measures rely on, and are limited by, being outcome-based incident indicators: they measure harm-causing incidents to quantify current catastrophic train accident risk trends, but are not necessarily useful as future predictive or underlying risk indicators. We overcome this through use of our RM3 assessment to 'triangulate' our view of industry performance using a broad range of data and intelligence sources, such as:

(a) **performance indicators**, for example, near-miss events, which had the potential to cause harm;

(b) **content indicators**, such as asset management performance; and

(c) **context indicators**, such as measures of safety management culture and duty holders' risk management values.

1.6 When analysing harm over time, it is important to consider the annual trends of passenger numbers and freight traffic (see Figures 1.1 and 1.2). Overall, passenger journeys on Britain's mainline railway network between April 2021 and

March 2022 recovered to 990 million journeys. This was an increase of 155% on the previous year but still only 56% of the journeys made in the last full year not impacted by the pandemic (April 2018 to March 2019).

1.7 The number of freight trains running on the mainline railway network increased by 12.7% on the previous year to over 210,000. With the exception of the two years affected by the pandemic, this was the lowest number of freight trains on the network since the time series began in April 2003.

Figure 1.1 Passenger journeys since 1946, Great Britain annual data

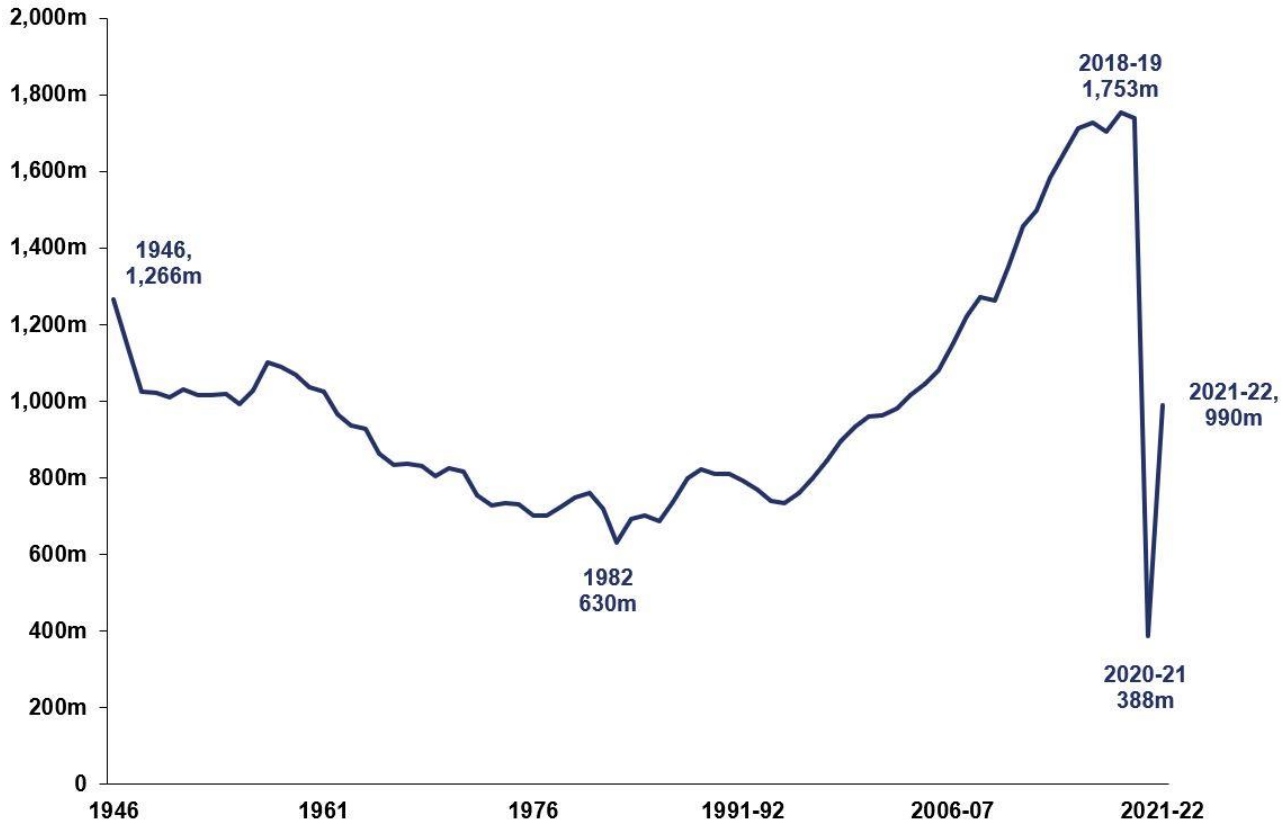
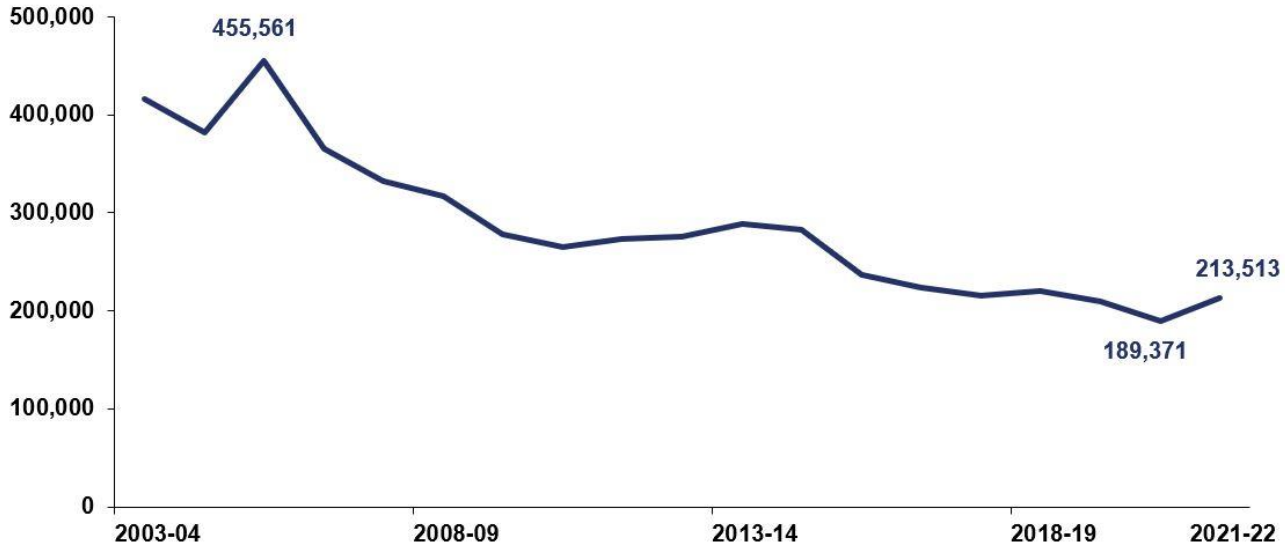


Figure 1.2 Number of freight trains run, Great Britain, annual data, April 2003 to March 2022



1.8 This report uses final and some provisional railway data from within ORR and from a range of other sources, as set out below. Confirmed safety data for 1 April 2021 to 31 March 2022 will be issued in our key safety statistics release in September 2022. It will contain finalised numbers from both mainline and non-mainline sectors.

1.9 Our FWI classifications and weightings are:

Workforce

(a) 1 fatal = 1

(b) 1 specified injury = 0.125

(c) 1 over seven day injury = 0.1

Passengers and Public

(d) 1 fatal = 1

(e) 1 severe injury (direct to hospital) = 0.025

1.10 FWI and other figures within this report may differ from those produced by other industry bodies. This is because our figures are based on RIDDOR reportable injuries only, whereas other FWI figures may include non-reportable injuries as well as shock and trauma incidents.

1.11 Furthermore, our FWI figures are not normalised so do not take into account changes in behaviour, for example, increased work hours or fewer passenger journeys.

1.12 We also rely on data obtained from various sources across the industry. The majority of data for mainline operations is held in the Safety Management Intelligence System (SMIS) administered by RSSB. More information about SMIS and data quality can be found on the RSSB website. We also receive and assess Network Rail's internal Safety, Health and Environment Performance Report (the SHEP).

1.13 For some events it has not been possible for RSSB to differentiate reliably between passengers (people on railway property with intent to travel) and other members of the public. For that reason, this report combines injuries to members of the public occurring on trains or in stations with those to passengers.

1.14 Data for non-mainline operations is sourced from RIDDOR and from reports supplied by duty holders and industry bodies such as the LRSSB, UK Tram and Heritage Railway Association.

1.15 The significant reduction in activity caused by the pandemic restrictions is reflected in reductions in the numbers of reported events. Therefore, interpretation of changes in trends in data over the year or comparisons with previous years must be made with caution. For this reason, this report makes fewer references to data than has been the case in previous years.

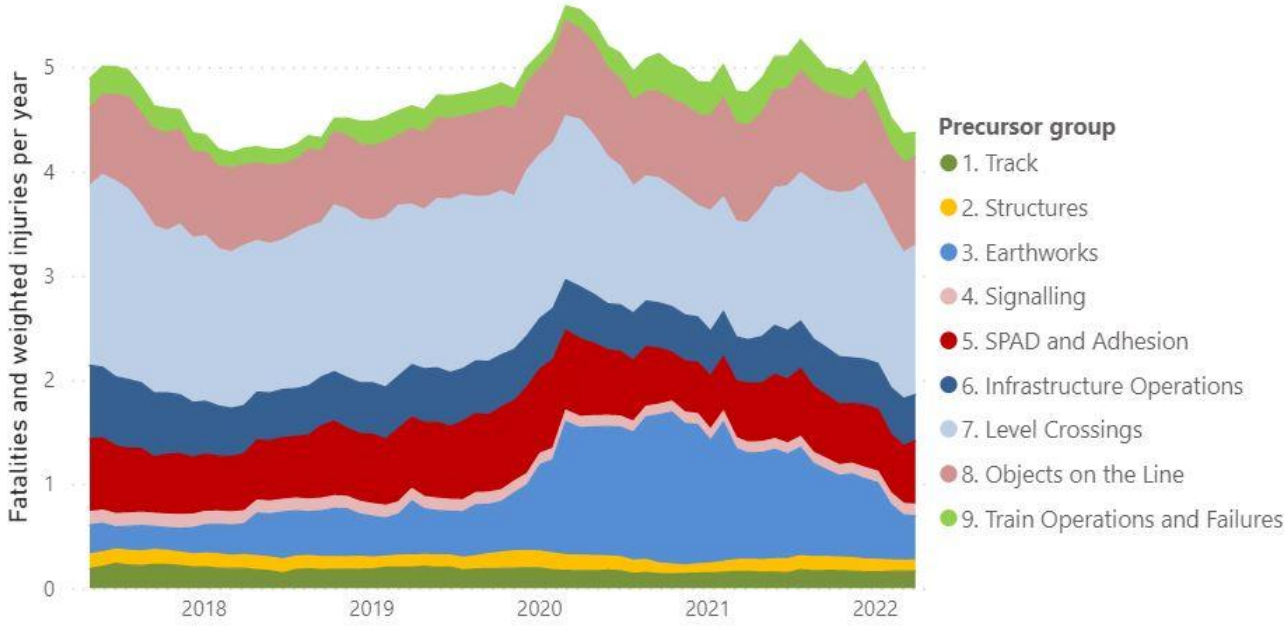
Mainline: Network Rail

Overview and overall RM3 assessment

1.16 This has been a year of change, challenge and hard choices for Network Rail. Like many businesses around the world, it has had to address the impact on finances, resources and performance of recovering from the pandemic. Passenger numbers have not recovered to pre-pandemic levels and there is lingering uncertainty about future demand. Like the rest of the sector, Network Rail has had to respond to reductions in its income. During the year it began a series of programmes, aimed at changing the way it works in order to reduce headcount.

1.17 These changes have come at a time when Network Rail has also had to begin planning to make the transition to Great British Railways. It is to be commended for maintaining good safety performance in the face of potential distractions from its core business. Nearly all elements of the PIM show improved or maintained risk control.

Figure 1.3 RSSB's Precursor Indicator Model



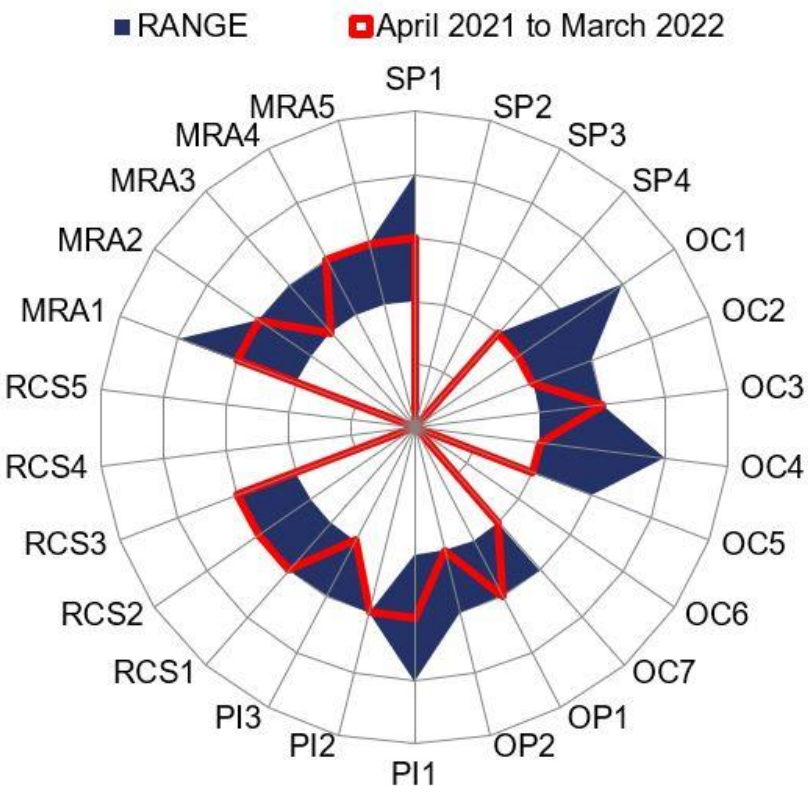
1.18 There have been some notable achievements: each Network Rail region reduced the number of breaches of the mandatory Life Saving Rules (LSRs) compared to the previous year; the LSRs are designed to deliver essential personal safety. Network Rail bettered its Train Accident Risk Reduction (TARR) target for the year, achieving aggregated risk reduction measured at 92% against its target of 90%.

1.19 In relation to workforce safety, the Safety Task Force programme has transformed how work is planned and carried out. Network Rail, in responding to ORR enforcement, has achieved a 98% reduction in lookout working and the moving annual average (MAA) of track work related near-misses fell by 70%. The proportion of maintenance work carried out in T3 possessions (where lines are blocked to normal passenger and freight traffic) has increased from 27% to 44%. Working with unassisted lookouts and lookout warning systems now constitutes less than 1% of national hours worked and by the end of the year, a majority of Network Rail routes reported no unassisted lookout working. This is a significant achievement in improved risk control for those whose work takes them on or near the running line.

1.20 Beneath the headline data and trends, there are some details which show that the picture is more complex and nuanced, and indicate why ORR is concerned about the continued potential for failure of Network Rail's risk control framework. Our assessments of Network Rail's management maturity, via RM3, reveal that the organisation is not yet consistently and reliably delivering the vision of its own health and safety management system. ORR uses the RM3 model to identify the gap between the 'work as imagined' of the written safety management and the

'work as done' actions taken at the sharp end; the 'here and now' of task performance. In an organisation as large as Network Rail there will always be a variety of assessment levels across the company, and the modal average is often finely balanced and does not tell the whole story. We use our findings as the basis for a discussion with the duty holder about how it should progress to excellence; it is not a simplistic numbers exercise.

Figure 1.4 Network Rail (April 2021 to March 2022)

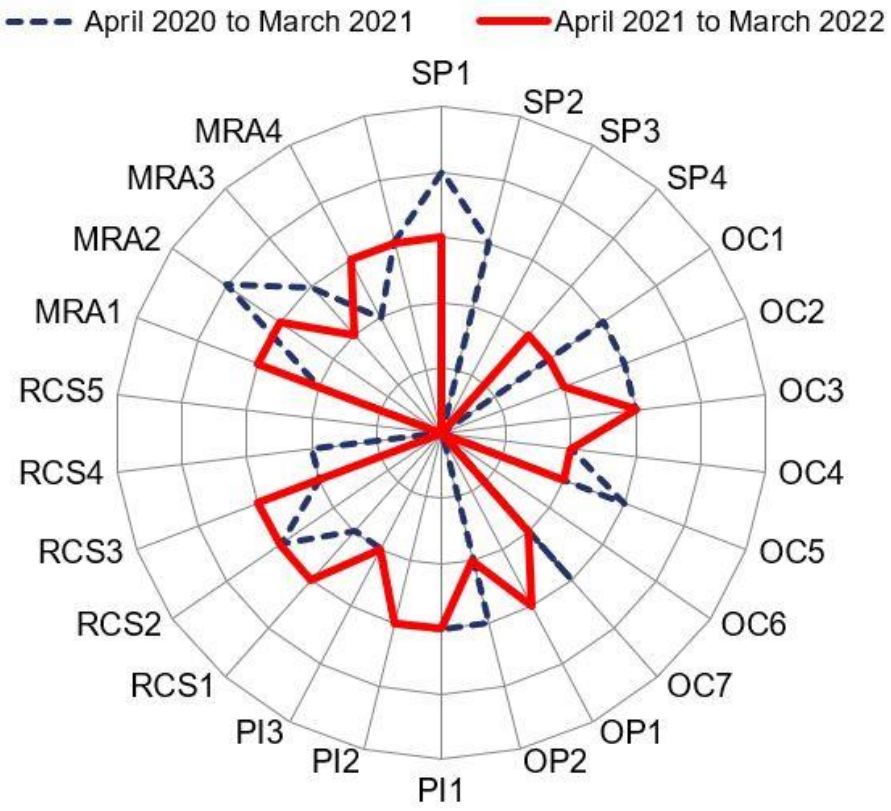


Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
SP1	Leadership	3	2	4
SP2	Safety policy	No score	No score	No score
SP3	Board governance	No score	No score	No score
SP4	Written safety management system	2	2	2
OC1	Allocation of responsibilities	2	2	4

Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
OC2	Management and supervisory accountability	2	2	3
OC3	Organisational structure	3	2	3
OC4	Communication arrangements	2	2	4
OC5	System safety and interface arrangements	2	2	3
OC6	Culture management	No score	No score	No score
OC7	Record keeping	2	2	3
OP1	Worker involvement and internal cooperation	3	2	3
OP2	Competence management system	2	2	3
PI1	Risk assessment and management	3	2	4
PI2	Objective and target setting	3	3	3
PI3	Workload planning	2	2	3
RCS1	Safe systems of work including safety critical work	3	2	3
RCS2	Asset management (including safe design of plant)	3	2	3
RCS3	Change management (process, engineering, professional)	3	2	3
RCS4	Control of contractors	No score	No score	No score
RCS5	Emergency planning	No score	No score	No score
MRA1	Proactive	3	2	4
MRA2	Audit	3	2	3
MRA3	Incident investigation and management	2	2	3

Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
MRA4	Review at appropriate levels	3	2	3
MRA5	Corrective action and change management	3	2	3

Figure 1.5 Year on Year Comparison, April 2021 to March 2022 with the previous year



Code	Description	April 2021 to March 2022 score	April 2020 to March 2021 score
SP1	Leadership	3	4
SP2	Safety policy	No score	3

Code	Description	April 2021 to March 2022 score	April 2020 to March 2021 score
SP3	Board governance	No score	No score
SP4	Written safety management system	2	No score
OC1	Allocation of responsibilities	2	3
OC2	Management and supervisory accountability	2	3
OC3	Organisational structure	3	3
OC4	Communication arrangements	2	2
OC5	System safety and interface arrangements	2	3
OC6	Culture management	No score	No score
OC7	Record keeping	2	3
OP1	Worker involvement and internal cooperation	3	No score
OP2	Competence management system	2	3
PI1	Risk assessment and management	3	3
PI2	Objective and target setting	3	3
PI3	Workload planning	2	2
RCS1	Safe systems of work including safety critical work	3	2
RCS2	Asset management (including safe design of plant)	3	3
RCS3	Change management (process, engineering, professional)	3	2
RCS4	Control of contractors	No score	2
RCS5	Emergency planning	No score	No score
MRA1	Proactive	3	2
MRA2	Audit	3	4

Code	Description	April 2021 to March 2022 score	April 2020 to March 2021 score
MRA3	Incident investigation and management	2	3
MRA4	Review at appropriate levels	3	2
MRA5	Corrective action and change management	3	3

1.21 Our RM3 assessment for Network Rail from 1 April 2021 to 31 March 2022 shows a mixed picture with improvements in some areas but apparent deterioration in others. It must be remembered that last year railway operations and risks were different due to the impact of the pandemic, and caution is needed in comparing years where the quantity, quality and consistency of evidence were very different. We found that most of the evidence was in the managed and standardised assessment levels requiring some fine judgements to give a final assessment. In many cases the 'final' assessment is not the most informative outcome; it is understanding the range of evidence within the criterion. This was another year without any 'ad hoc' assessments, showing that there is a gradual strengthening of reliability of the health and safety management systems.

1.22 We are alert to the fact that the lack of progression in management maturity could be an early indicator of the impact of change in the sector. The important point is that we believe that Network Rail understands and has identified what actions are required to support the development of an excellent safety culture. In areas where there has been sustained focus over recent years, such as assurance and workforce safety, we saw improved maturity assessments: MRA1 Proactive Monitoring, MRA4 Management Review and RCS1 Safe Systems of Work. Network Rail has shown with its Safety Task Force for workforce safety improvements that it can deliver significant, ambitious change effectively. This has been achieved by strong safety leadership, informed by good understanding and analysis of performance data. We look to the company to bring that effectiveness in change management to the full range of challenges it faces over the coming years.

Evidence gathering and inspection activities

1.23 Our work focused on strategic priority areas, where we were most concerned, to influence Network Rail to improve. We progressed our planned proactive work through site visits and via regular liaison meetings in the regions and with the Technical Authority (TA) of Network Rail. We investigated incidents and we monitored how recommendations from RAIB reports are addressed. We carried out interventions in a wide range of subjects over the year, with our most

significant resources devoted to workforce safety and to weather-related improvements to earthworks, drainage and operations management.

1.24 Analysis of safety performance indicators for the year shows a mixed picture. For example, although overall compliance with the LSRs improved across the network compared to last year, this was largely due to measures to address road vehicle speeding (breaches of this LSR constitute about 90% of the total non-compliances). In relation to electrical safety, on the other hand, LSRs designed to ensure equipment is made dead before work takes place ('Test before touch' and 'Test before earth') did not show improved compliance and we continued to find confusion and inconsistency in their application. Following an incident at Wolverton in May 2021 where a linesman sustained electrical burns following contact with the overhead lines, we investigated and issued two improvement notices requiring strengthened arrangements for the demarcation of isolated equipment and better implementation of the LSRs.

1.25 The PIM shows a sustained improvement in the modelled risk associated with earthworks failures and a reduced risk from structures' wrong side failures, which are now back at historic norms. ORR remains highly concerned about both areas, despite this apparently improving trend. This is because for both asset types Network Rail has accumulated backlogs in examinations; one of its frontline risk controls. Consequently, we have been pressing hard throughout the year for Network Rail to secure a sustainable reduction in the backlog (or a sustainable recovery of compliance).

1.26 One reason for the reduction in modelled earthwork risk has been the nature of the storms experienced over the year. Although, as in recent years, there has been extreme and adverse weather, the location and nature of it has led to fewer earthworks failures. The storms have, however, had other impacts. One of these is the precursor event 'objects on the line', which includes trees and flooding. The close correlation of this risk to extreme weather events makes it volatile. For instance, in period 12 which saw storms Dudley, Eunice and Franklin in rapid succession, 'objects on the line' in the PIM went from a 4% improvement (compared to the previous year) to a 30% deterioration in modelled risk.

1.27 Some trends have been affected by two years of the pandemic and its effects on train numbers and usage. This needs to be borne in mind when looking at the figures. For instance, last year saw a 23% reduction in the number of signaller wrong routing events, which is a major component of operational irregularities measured by the PIM. This was almost certainly due to reduced traffic levels following government restrictions in relation to COVID-19. As service levels have increased once more, signaller errors have shown an adverse trend. Network Rail is seeking to address the root causes by revising its competency management systems for operational staff. It has embarked on a substantial set of

improvements in operational competency arrangements, and we will continue to press them to deliver on these.

1.28 Following the pandemic service levels have increased over the course of the year and some user behavioural changes have continued, such as increased use of footpath level crossings, this has resulted in an increase in risk. The number of near misses at level crossings increased by 15.9% by the end of the year. Regrettably, there was a total of seven fatal level crossing accidents over the year, the highest number since year ending 31 March 2018.

1.29 Our engagement over the year has demonstrated Network Rail's strengths, but also revealed areas where improvement is required if health and safety management is to be sustained over a period of change. We saw evidently strong leadership in the Weather Risk Task Force, for example, bringing governance and oversight to Network Rail's response to the challenges of climate change adaptation and addressing the weaknesses revealed by the causes of the derailment at Carmont. It is an ambitious programme and we have struggled to judge the effectiveness of its delivery because it is shared amongst the regions and central functions, many of whom have decided to interpret the requirements differently. We are concerned that the scope of work may become unfocused, as RAIB recommendations and related actions are added.

1.30 We asked a number of questions related to the 'Modernising Management' voluntary severance scheme. We remain concerned that, whilst many key safety roles were protected, there will not always be the same level of skills, knowledge, experience and corporate memory available. Further, we still do not fully understand the impact on planned activities of a 20% headcount reduction. Where there are proposed changes to how things are done, it is not yet always clear that reliable alternatives are available. For instance, it is envisaged that ergonomic scrutiny of proposed projects (renewals, enhancements etc.) will fall increasingly to the supply chain, rather than Network Rail's own central Ergonomics Team. However, we do not yet have confidence that there exists the appropriate skills in sufficient numbers.

1.31 Our inspections showed areas of notable achievement, such as the near elimination of unassisted lookout working. We saw examples of management maturity, such as the System Operator (one of Network Rail's central functions, overseeing timetabling, access and operations) sharing with us its concerns about operational competence. In a year of potentially distracting changes, Network Rail largely maintained good levels of safety performance. We are concerned, though, that there are sufficient indications beneath the headline trends of the vulnerability of the risk control framework. We will ensure, over the coming period of continued change, that Network Rail sustains focus on leading performance indicators and is alert to early signs of deteriorating trends.

Worker Safety

Overview

1.32 This year we concentrated on assessing Network Rail's work to comply with our enforcement action aimed at improving track worker safety. This encompassed inspections across the country as well as continuing liaison at local, regional and national level. We also investigated a number of accidents and near-misses, including two serious accidents to track workers, both in May 2021. We also continued to monitor workforce and contractor injury trends.

Evidence gathering and inspection activities

1.33 This year saw one fatal accident to a Network Rail worker as a result of a road traffic collision in East Anglia in January 2022, which is a matter for police investigation. We are investigating two accidents where workers sustained serious injuries, one as a result of a collision between two track-mounted vehicles in Anglia route, and the other where a linesman received electrical burns from contact with overhead lines at Wolverton in the North West and Central region. The latter incident, taken together with earlier similar incidents, prompted us to take enforcement action requiring Network Rail to improve the way it demarcates and proves dead overhead line isolations.

1.34 Network Rail's long term injury frequency rate (LTIFR) remained static, continuing the trend since 2018, although fatalities and weighted injuries (FWI), a measure of accident severity, showed sustained improvement in the second half of the year. Incidents with a high potential to injure workers rose slightly during the year. Many of these concerned safety around track work, reminders that this continues to be a priority area.

1.35 Much of our work concerned monitoring progress through a programme of inspections in all Network regions towards compliance with our enforcement notices on track worker safety. In line with our ongoing emphasis on the industry supporting people, Network Rail had provided resources to plan scheduled work in possessions or line blockages, an essential prerequisite to safer trackside working. We found substantial reductions in the amount of work done between trains, using lookouts, but noted consequential pressures on track access for maintenance activities. Technology designed to protect or warn workers, either in line blockages or on live lines, is still developing, as is Network Rail's understanding of how and where it is best used. Implementing these technologies effectively has not been an easy process and undoubtedly Network Rail has more work to do to identify, efficiently progress and safely implement new technology.

1.36 Despite these problems, at the end of the year lookout warning was used in just 0.5% of hours spent delivering maintenance work, a huge reduction on pre-2019 levels. Similarly, in the past year the moving annual average (MAA) of track work

related near-misses fell by 70%, although as noted above these continue to happen and need ongoing vigilance to drive down numbers. We will be undertaking further monitoring and inspection between now and the Improvement notices compliance date of 31 July 2022 before deciding whether Network Rail has met the requirements of the notices.

Occupational Health

Overview

1.37 We continued to enjoy excellent engagement with Network Rail's central occupational health team The year saw a welcome recovery in medical surveillance activities, following the impact of pandemic restrictions, but revealed some concerning trends in new and worsening cases of hand arm vibration syndrome (HAVS), the causes of which are not fully understood. Network Rail also made significant progress in revising its arrangements to control the risks from weld fume. We had to intervene to improve the effectiveness of information available to staff concerning asbestos containing materials, and we remain alert to the challenge of how Network Rail regions will devise targeted, proportionate controls for the significant numbers of 'lesser' risk categories of assets in its asbestos register.

Evidence gathering and inspection activities

1.38 We were unable to carry out our site inspections of weld fume controls as planned due to the pandemic impacting on the supply of appropriate respiratory protective equipment and a delay in the implementation by Network Rail of improved control arrangements. We continued to monitor Network Rail's assessment of the risks and provision of revised guidance and instruction. Our site visits will now take place during the forthcoming work year

1.39 We welcomed the decisive leadership provided by Network Rail's national asbestos programme team in driving progress by regions and discipline technical leads, and the open and responsive approach to challenge from ORR. We commend the efforts by regions to innovate in their approach to managing asbestos (for example by developing archetype reports) and support continued efforts to share and adopt good practice on asbestos across the business. The current plan for asbestos management to move from a national priority programme to 'business –as –usual' management by regions in early 2023 requires further action in several priority areas. These include a critical review of arrangements to ensure adequate training and competence of maintenance and other staff directing work liable to disturb asbestos; provision of clear information in the Asbestos Risk Management System asbestos register for unsurveyed assets where asbestos is presumed; completion of the agreed 10% low priority asset sample surveys; and formal arrangements for reporting against compliance based asbestos KPIs at

regional and national level. To deliver all these outstanding priorities by January 2023 seems ambitious against the current pace of progress.

1.40 The continued diagnosis of new (18) and particularly worsening (6) HAVS cases remains a concern. The 'deep dive' analysis of new and worsening HAVS cases, previously carried out by the Network Rail Technical Authority, had the potential to identify and address common underlying weaknesses in HAVS risk management. This depth and breadth of organisational learning now appears to be missing. Our enquiries into worsening HAVS cases this year confirm that the current monitoring and assurance regime is not working as well as it should. There is evidence of failure by some routes to complete adequate Level 1 (conducted by line managers) investigations and health management action plans. Furthermore, there are systemic weaknesses in managerial supervision and training. While the plan for a Level 3 (led by Network Rail's Technical Authority) internal audit on HAVS management next year is very welcome, more needs to be done to strengthen accountability on HAVS compliance beyond monitoring of clinic attendance and diagnosed cases. On statutory health surveillance compliance, concerted efforts in the final quarter of the year to recover completion of scheduled HAVS Tier 2 symptom checks to 95.9% are welcome. However, better planning at local level to avoid the 'yearly sprint to the finish' would reduce pressure both on local teams and occupational health services.

1.41 We noted the backlog of respirable crystalline silica (RCS) health surveillance clinic appointments, and the decision by Network Rail's occupational health provider to suspend spirometry based on their assessment of COVID-19 risks and ventilation standards in clinic spaces. The current pause in lung function testing for occupational exposures to RCS should remain under active review and justified based on the risk. Suitable mitigations should be kept in place to ensure that early or worsening signs of disease can be identified promptly. The pace of progress towards agreeing evidence-based guidance for regions on risk assessment and control for both welding fume and RCS in conventional renewals was slower than planned. This was due to COVID-19 delaying completion of exposure monitoring and constrained resource within the Technical Authority corporate workforce safety team. Further work is needed to formalise and communicate revised benchmark standards for RCS and welding fume control. Additional work is also required to deliver the associated improvements in engineering (ventilation, dust suppression) and organisational controls (exclusion zones, systems of work) needed to meet the strengthened enforcement expectations for adequate control of carcinogens. The provision and use of approved local exhaust ventilation (LEV) for arc welding fume, and action to prevent the build-up of carbon monoxide from diesel powered welding generators in working areas of tunnels, are key priorities. Enhanced training and supervision in maintenance and conventional renewals functions, as well as Capital Delivery and supply chains, will be key to embedding the requirements for enhanced RCS and welding fume control.

Level Crossings

Overview

1.42 This was a year of mixed achievements for the management of risk at mainline level crossings. Network Rail's own measure of modelled risk had decreased over three consecutive periods by the end of March 2022 (railway period 13). The calculated benefits of all risk reduction activity exceeded the target for the year, equivalent to 0.751 FWI against a target of 0.661.

1.43 Following the pandemic service levels have increased over the course of the year and some user behavioural changes have continued, such as increased use of footpath level crossings, this has resulted in an increase in risk. The number of near misses at level crossings increased by 15.9% by the end of the year. Regrettably, there was a total of seven fatal level crossing accidents over the year, the highest number since year ending 31 March 2018. This is two more than in the previous year and five more than in the two years before that.

1.44 Six of the seven fatal events involved pedestrians, providing a stark demonstration of the importance of improving crossing safety for those users on foot. We will continue to monitor how well Network Rail progresses its strategy for passive level crossings, including ensuring that appropriate investment decisions, based on risk priorities, are made when there are tough choices.

Evidence gathering and inspection activities

1.45 Most of our proactive inspection activity was focused on central strategic influencing of Network Rail and on ensuring appropriate responses to our findings from our April 2020 to March 2021 inspections of the delivery of the Network Rail level crossing strategy. We have also encouraged Network Rail to concentrate on addressing some long-standing RAIB recommendations relating to level crossing safety. Good progress has been made, with us able to provide positive feedback to RAIB regarding implementation of the recommendations.

1.46 We continued to work with Network Rail to generate case studies to illustrate how to adopt our Principles for managing level crossing safety guidance issued in June 2021 and how to incorporate tools Network Rail has developed to help choose between options to improve level crossing safety. Network Rail was also a major contributor to the work of our stakeholder consultation group, helping to develop a revised Level Crossing Order Process. This was published in April 2022.

1.47 Network Rail raised the issue of the use of Miniature Stop Lights (MSLs) on public roads. Their use in such circumstances has been prohibited since the late 1970s, following a Ministry of Transport & British Railways Board report and a fatal collision at such a crossing at Naas in March 1979. Network Rail wanted to review this decision, in the light of changes to technology and crossing user patterns since the time of the agreement not to install them on public roads. We helped focus Network Rail's assessments of the risks and concluded that we had no objection to their introduction. This conclusion was reached on the basis that each decision was supported by a site-specific risk assessment taking account of a range of factors affecting the suitability of MSLs as a means of managing safety.

1.48 We set out a series of challenges to Network Rail to use the opportunity to explore what more might be done to enhance safety provision at crossings with MSLs, including: consideration of use of barriers rather than gates; consideration of how gate design might be improved; the role of power operation of gates, and the potential to interlock or interlink gate closure with the approach of a train to a crossing. We are keen to encourage greater innovation and smoother processes to adopt new technologies, reflecting that Network Rail has not always had a good record in this area. We are still, for example, awaiting the roll-out of 'meerkat' technology, which works to provide warning to users of crossings that currently relying on a driver to sound the train horn as warning. We will continue to press Network Rail to become more effective at realising the benefits of new technologies.

Human Factors

Overview

1.49 We enjoyed a year of excellent engagement with Network Rail on a range of topics including fatigue management, design of digital signalling systems, design of Route Operating Centre (ROC) systems and electrical Supervisory Control and Data Acquisition (SCADA) systems as well as progressing a number of RAIB recommendations.

1.50 The work year was dominated, though, by the changes made to the Network Rail ergonomics team as part of their programme: Modernising Management. We have continuing concerns about how well human factors expertise can be incorporated into delivery of essential projects and work streams.

1.51 We are concerned that the Network Rail ergonomics team size seems insufficient to support the current breadth of work and the pace and scope of change such as the development of significant initiatives for train control. We have not yet seen evidence of sufficient human factors capability in the supply chain. This leaves the industry potentially exposed and reliant on the capabilities of the smaller Network Rail ergonomics team to identify and recover shortcomings before it is too late. Education of Network Rail engineers and managers in the value and importance of human factors might be an effective strategy in holding suppliers to account. However, this has not yet been accomplished, and we will be monitoring interim arrangements very closely.

Evidence gathering and inspection activities

1.52 We paid close attention to how well Network Rail integrates human factors into design. This included site visits to the Kings Cross ETCS (European Train Control System) simulator and to the West Somerset Railway trial site for developing RBLS (Radio Based Limited Supervision). RBLS is a derivative of ETCS which has the potential to provide a value for money basis for signalling replacements or overlays. Our work has shown that the supply chain does not yet seem to have the capability or maturity to provide the ergonomic input to design that we would wish to see. As a member of the industry Human Factors Strategy Group, we will consider what steps can be taken to address the lack of human factors competence as this issue impacts upon the industry as a whole.

1.53 In the meantime, we commend the innovation shown by the Network Rail ergonomics team to secure improvements in this area. In order to maximise integration of human factors into design, the Network Rail ergonomics team is developing a human-in-the-loop simulation. This model will stress test early driveability assumptions (for RBLS and its variations), using a range of driver personae and a battery of psychological and physiological tests. The work is being carried out in collaboration with the UK Rail Research and Innovation Network

(UKRRIN) based at Birmingham University. Output from this study is expected to inform any product requirements specification. We visited UKRRIN in February 2022 and will continue to observe the trial, when appropriate. We commend this prototyping and simulation approach as part of an iterative design process and support its widespread adoption.

1.54 At the end of the work year we began our delayed (due to Government lockdown restrictions) inspection activity of the Route Operating Centres (ROCs). We evaluated signaller error and workload, and followed up user concerns with the interface for TPCMS (Traction Power Centralised Management System) SCADA; a new, single platform for the control of the entire traction power network. We inspected early introduction of the equipment at Romford and now want to assure ourselves that version 5 resolves outstanding issues.

1.55 We also wish to understand more about the status of the implementation of traffic management solutions on the network. There are multiple types of traffic management provided by a range of suppliers, offering different levels of functionality. A key challenge is how to manage integration across system boundaries made complex by the variety of implementations. There may be a need to standardise the interfaces between the planning layer and movement control in order to manage the whole network.

1.56 We continued to engage regularly with Network Rail's Fatigue Improvement Programme (FIP) team throughout the year, pursuing firmer commitment to a long-term strategy to close Network Rail's risk gap on fatigue. We have been pleased to note evidence of an honest recognition that existing fatigue controls require improvement. There has been a stated willingness to pursue such improvements in a prioritised, incremental way with better supporting systems, with staff and management engagement, and with efforts to nurture a more open, honest culture towards fatigue and alertness. We saw positive developments in the procurement of deep expertise to assist the FIP, but also continue to be frustrated by the slow pace of measurable improvement in the regions and functions. There continued to be concerning levels of exceeding existing fatigue controls in both maintenance and operations, and the existing controls are already far from aligned to good practice. Further, Network Rail anticipates incomplete compliance with its own standard for fatigue management by their own due date of October 2022. This is disappointing, especially as the standard in question is still framed largely in terms of the rudimentary 'Hidden' hours-based exceedances rather than recognised good practice in designing fatigue friendly rosters. We will continue to push Network Rail to adopt targeted, ambitious plans for improvement, that are commensurate with its management maturity. Better understanding of the root causes of existing exceedances will be key to securing future improvements; we look forward to the results of work taking place to establish these reasons.

Track

Overview

1.57 Throughout the year, we continued to monitor Network Rail's progress in developing its track asset knowledge, understanding of risk, and risk control delivery. We did this through central, strategic influencing at our liaison meetings, by targeted probing of incidents, and proactive inspection. This work has involved all regions.

1.58 Our proactive inspection this year covered effectiveness of Network Rail's Special Inspection Notice (SIN) process in addressing identified track issues. Strategic scrutiny covered a wide range of plain line track topics, including track geometry performance, broken rails, longitudinal bearers, track recording fleet and staff competency.

1.59 For track assets, Network Rail's key performance indicators nationally continue to be at or close to 'best ever' levels. As for previous years, they remain vulnerable to discrete faults and the impact of extreme weather events, in particular on those routes with a significant number of clay subsoils and embankments where swelling and shrinkage effects of the soil from dry and wet periods can affect track geometry.

1.60 Due to the excellent medium to long term performance managing of track and switches and crossings, ORR has reduced its proactive activity in these areas to focus on other priority areas where performance has not been so good, and where we can add more value to industry's efforts to secure improvements.

Evidence gathering and inspection activities

1.61 Our track related SIN inspection project covered the Network Rail regions of Scotland, North West and Central, Eastern and Southern. The aim was to test the effectiveness of the SIN process in delivering required changes: that required action plans had been developed, delivery of those plans and management of the underlying risks the plans were aimed to address.

1.62 We tested the application of three track related SINs:

(a) SIN 183 (Cast Crossing Inspection and Replacement).

(b) SIN 184 (Control and Documentation of Maintenance Boundaries).

(c) SIN 185 (Identification and Inspection of Plain-Lined Signalling and Crossings).

1.63 Overall, across all the regions inspected, there was a high degree of consistency in compliance with the SIN process and the effective delivery of the changes

required in each of the three SINs inspected. All regions inspected were shown to have effectively briefed the SINs to relevant staff and subsequently delivered the requirements of the SINs, largely to the timescales, stages and technical requirements detailed in the relevant SIN.

1.64 These findings, it should be noted, were based on a small sample of SINs and Track Maintenance Engineer (TME) areas. The evidence provides a good degree of confidence in the effectiveness of the Network Rail SIN process in the track community in general. However, we note that following our site inspections, and in areas we did not inspect, there have been significant issues with final compliance with Part B of SIN 184, Control and Management of Boundary Documentation. Delivery of these requirements has been inconsistent.

1.65 Our inspections found issues regarding quality and completeness of records. The main area where the delivery of the SIN process could be strengthened is the assurance arrangements to track progress with SIN actions. This was reflected in each of the regional reports in the RM3 assessments for MRA1 (proactive monitoring), which were all at managed level.

1.66 We identified four areas to support RM3 continuous improvement, for Network Rail to consider further:

(a) Regional level assurance arrangements to track progress with SIN actions.

(b) Improving the consistency and accessibility of TME Track Risk Registers.

(c) Improving the process for permanent removal of redundant signalling and crossings.

(d) Improving engagement with third party premise track owners to better manage risk around boundaries.

1.67 Our central liaison activities covered a range of topics where we are supporting Network Rail to improve: the reliability of the data measuring fleet and exploring how to expand its provision; identifying how to sustain good levels of track geometry and minimise rail defects, including the ambition to have no more than 50 rail breaks a year by 2030; introducing a more effective competence management system for technical staff.

Lineside

Overview

1.68 During the year we continued to monitor Network Rail's progress in developing its lineside asset knowledge, understanding of risk, and delivery of improved risk control. The Network Rail Technical Authority has focused primarily on the continued development, evolution and improvement of the arrangements for managing the asset safely. This has embraced: capturing accurate lineside asset data; inventory; monitoring asset condition and performance; staff competence, and the use of technology for inspection. We were encouraged to note that the Digitised Lineside Inspection (DLI) tool was successfully trialled this year and will be rolled out during 2022 to 2023.

1.69 PIM elements relevant to lineside showed some slight improvements overall but rises in modelled risk for weather related objects on the line highlight the impacts of adverse weather events in certain periods. Current performance is not meeting the industry set target for CP6.

1.70 We noted good progress by the Network Rail Technical Authority in progressing the improvements required in management of lineside assets. The Network Technical Head is providing a framework that will enable growing maturity in stewardship of these assets, if effectively embedded.

Evidence gathering and inspection activities

1.71 We scrutinised the effectiveness of lineside risk control by a mixture of central strategic liaison meetings, targeted probing of incidents, and proactive inspection. This involved work with the Network Rail Technical Authority and with all regions. Our inspection project this year covered all Network Rail regions and focussed on inspection of incidents where trees or animals have obstructed the running lines.

1.72 Prior to this year we formally required all Network regions to plan to recover compliance with the company standard for vegetation management. By last year all routes (now regions) had demonstrated they had in place risk based, prioritised, short, medium and long term plans and associated programmes of work. Over this year, we monitored progress with the recovery programmes and wider vegetation management. We found that all regions were progressing their plans, but with some potential slight slippage in some routes against the initial projected end dates. This slippage is largely related to better refined plans informed by the practicalities and experience of delivering work in the early years of the programmes. We were most concerned about the progress on Southern region, with some specific actions currently being delivered to address those concerns.

1.73 Throughout the year, we continued to press Network Rail on a matter we have been pursuing for four years: establishing better quality and more extensive data to enable lineside asset condition and performance to be measured. During the year this had reached the point where the early data streams proved to be reliable and provided good coverage of the scale and makeup of the asset being managed. This first cut of information has enabled the Network Rail Technical Authority to begin to challenge regarding variability across the regions with respect to the planning and delivery of inspection and maintenance work (data had highlighted a culture of under-planning and over-delivery, which is now being addressed). The work also revealed issues with the currency of hazardous tree inspections and the population of the different risk categories. As DLI becomes embedded across the whole network, populating vegetation into 'alert', 'action' and 'immediate action' zones will become a repeatable, automated process, greatly aiding appropriate decision making about safe management of vegetation.

1.74 Our central strategic influencing activities saw good progress in Network Rail's development of a competency management system for lineside disciplines, the management of high wind events and addressing the issue of ash die back disease.

1.75 Last year we gave feedback to Network Rail on its management of boundaries. It made some changes to procedures as a result, but acknowledged that it needed to do more to ensure effective interim control of risk from faulty boundaries. It has set up a working group of relevant staff and developed clarifying instructions to cover the process from initial report of a fault to full remediation.

1.76 We decided to carry out inspections of one of the major risks arising from poor boundary condition: animal incursion. We combined this with exploring incidents when a tree has fallen and obstructed a running line. We investigated the circumstances of 19 tree fall incidents and 15 of animal incursion. We found:

(a) Some regions were significantly behind in their hazardous tree inspections (every 3 years). This inspection is a key part of Network Rail's risk control framework, so it is important these are brought into compliance. We have required plans to demonstrate that the backlog will be addressed.

(b) Significant lengths of the railway have non-compliant vegetation profiles. Combined with increasing prevalence of extreme, high wind, weather events, this requires good mitigation of the hazards. Wales route is trialling how to make better use of the hazardous tree and 3 yearly vegetation inspection data (and in due course DLI data) to target application of speed and line restrictions for high wind events.

(c) In several cases incursion occurred at a site where poor condition fencing had been identified, but the measures to maintain an effective boundary had been ineffective. This echoes the key finding from our April 2020 to March 2021 inspection project and emphasises the need for further improvements in managing the risks following identification of sub-standard boundaries.

1.77 We concluded that Network Rail needed to do more to train and develop the competence of staff involved in lineside work.

Civil Engineering Assets

Overview

1.78 The management of civil engineering assets is fundamental to the control of precursors to catastrophic risk. Safe movement of trains relies on the integrity of the embankments, cuttings, bridges and viaducts that support track. The fatal derailment at Carmont in August 2020 showed the consequences of not getting this right. The causes of the wash out that derailed the train revealed a range of weaknesses in Network Rail's arrangements to design, inspect and maintain its assets to make them resilient. It also illustrated how much greater that challenge is as we witness increasingly frequent and severe weather events.

1.79 Network Rail's improvement plans to address these areas are ambitious. We are satisfied that they are appropriately targeted and prioritised but are still concerned about how the industry will maintain the right levels of focus to ensure that consistent and sustained actions result from the plans. Our work this year has demonstrated that, still, too often Network Rail is not getting the basics of asset stewardship and compliance with process right. This has to be addressed if the required improvements are to be achieved.

Evidence gathering and inspection activities

1.80 Monitoring post Carmont inspection activities has been a significant part of our work this year. Centrally, we have seen the Weather Risk Task Force Steering Group (WRTFSG) bring considerable leadership, rigour and energy to its oversight of the seventeen action plans for improvements to earthworks and drainage management and the ways that the industry responds to forecasts of adverse and extreme weather. These plans are derived from analysis of the recommendations from the Mair and Slingo task force reports.

1.81 We have seen significant early achievements against plans. For example, Network Rail has introduced the Convective Alerting Tool (CAT), which monitors rainfall weather events and notifies route controls when pre-determined thresholds are about to be reached. This enables operational mitigation measures to be implemented in real time on discrete geographical sections of the network. This work represents a positive use of technology to reduce the risk to trains associated with adverse and extreme weather.

1.82 For the plans which are still open, we have struggled in some cases to understand the timescales, milestones and outcomes of all the constituent parts of action plans. We need confidence that the plans in this critical area are credible and are also concerned that, with the addition of relevant recommendations from RAIB, there is the potential for loss of focus and for efforts to be spread too thinly.

1.83 We examined the plans in each Network Rail region to implement the actions arising from the Lord Mair recommendations for which they were responsible. We found significant variation in the approach to implementing the action plans within the regions. Some regions had suitable plans in place; whereas others had not provided documentation on how they will be implementing the action plans and in one instance there did not appear to be, at the time of inspection, an approved strategy and way forward. Additionally, we continued to find deficiencies in the basics of asset management relevant to the action plans. For drainage asset management we saw non-compliance with processes for the completion of drainage asset surveys and recording data accurately; for identifying 'unknown' assets; and for considering drainage as a system, rather than discrete assets.

1.84 In respect of structures examination compliance, we found a significantly deteriorating picture over the year. The end of year non-compliance data indicates that there were a total of 2038 structures non-compliant on site for detailed examination and 5767 structures non-compliant on site for visual examination. National non-compliance during the year was significantly worse than the end of year position. Network Rail regions have stated that a significant element in the worsening of non-compliance is the changes made to their contracting arrangements at the beginning of the year. We have required recovery plans from

each region. These are at differing stages of maturity, but all will be monitored closely until we are assured that appropriate mitigation is in place.

1.85 Examination of tenanted arches remains a concern. However, the year has seen significant improvements in the compliance position, with the existing backlog of examinations eliminated in North West and Central region and substantially reduced in Eastern region. This has been achieved in part due to a much-improved relationship between Network Rail and the company who took over the leasing arrangements for these premises, helping to facilitate the necessary examinations. The most acute problems continue to be in Southern region, where many more arches are occupied, often with substantial cladding and other installations. Examination is a complex challenge in these circumstances. We have accepted a recovery plan to achieve compliance by delivering examinations over the long-term, prioritised partly on risk and partly on opportunity. We required this plan to ensure that safety risks are effectively managed at these arches and the infrastructure that they support.

1.86 We carried out scrutiny of earthworks evaluation and defect monitoring by sampling reports in two Network Rail regions. We identified improvements that could be made to ensure better compliance with the standard for evaluating earthworks examinations and taking appropriate action to address defects reported. We found there was scope to further develop an effective work bank management tool to enable earthwork risks to be identified, recorded, tracked to completion, and linked to the permanent asset record.

1.87 Over the course of the year, we continued to monitor progress in improving drainage asset knowledge. All regions made progress to identify and verify drainage assets, to increase asset knowledge and to complete a full drainage asset database. Routes provided updates and whilst the completion date across the regions vary, all routes have plans in place to have completed the asset knowledge inventory by the end of CP6. Some routes are slightly behind on the project plan, and further intervention work during next year will seek to ensure the emphasis is maintained on completing the asset register.

1.88 In May 2021, the gable wall at Northwich station failed and collapsed through the canopy and onto the platform. Subsequent investigation identified that established vegetation growth in and around the structure had affected the structural integrity of the building. This incident (which remains under ORR investigation) has highlighted weaknesses in Network Rail's buildings asset management regimes. In particular, it has shown the impact that unmanaged vegetation growth can have on structures and the importance of its effective and timely identification and removal in preventing similar structural failures. Network Rail has identified remedial arrangements to address the risk by means of a round of special inspections and associated actions. We will be inspecting this in the coming year.

Electrical Safety

Overview

1.89 We continue to support Network Rail's Electrical Safety Delivery Programme (ESDP). We see it as the effective and appropriate means in the medium to longer-term to achieve improved control of risks and enhanced compliance with the requirements of the Electricity at Work Regulations 1989.

1.90 However, our work this year has shown there is still much to be done to ensure consistent adherence to existing earlier improvements. In particular, we continued to find confusion and inconsistency in the understanding and application of Network Rail's electrical safety LSRs. We accepted these when first introduced as the best interim means of managing electrical safety until more substantive improvements could be delivered by ESDP.

1.91 We investigated two incidents where the LSRs failed to ensure that staff had proved that conductors were dead before working, and significant harm occurred as a result. One was at Kensal Green in December 2019 and the other at Wolverton in May 2021. Given this evidence, we issued an Improvement notice requiring Network Rail to introduce consistent rules and equipment to physically mark the limits of electrical isolations. We issued a further Improvement notice to review the electrical LSRs and ensure their better embedment.

Evidence gathering and inspection activities

1.92 We hold regular meetings with Network Rail Technical Heads for electrical systems. This is our main means of influencing to secure the strategic changes we would like to see. We supplement these meetings by on-site inspection work, to establish how well promised improvements have been implemented.

1.93 The main focus of our activities in the past year has been:

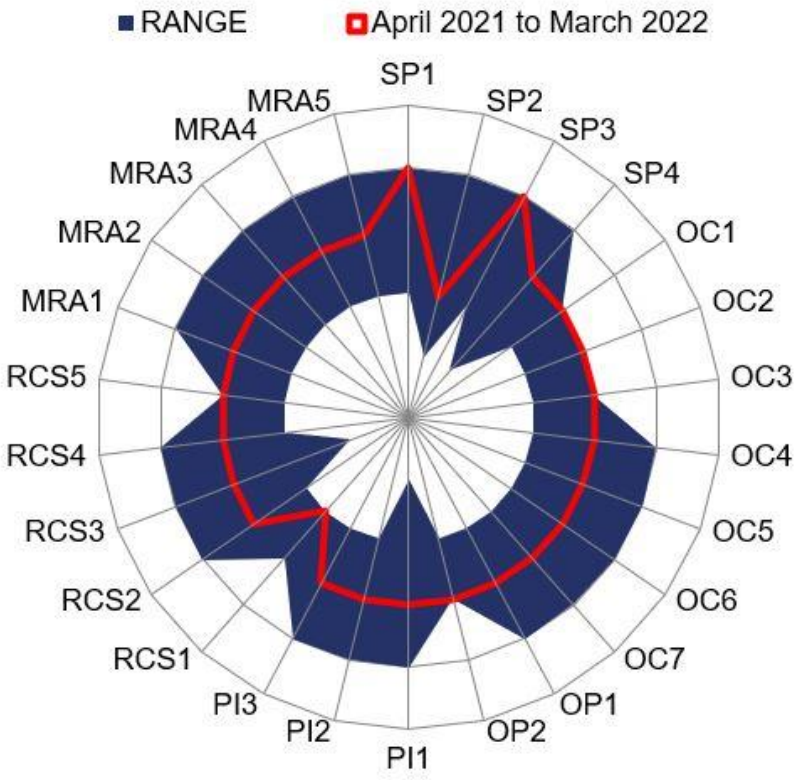
- Following up improved arrangements for staff attending faults after a serious flashover incident at Godinton on the Southern region DC network several years ago. We found good progress had been made to deliver better processes, but were still able to offer suggestions for further improvement.
- Extensive inspections to corroborate improvements to physical demarcation of electrical isolations. Good progress had been made to introduce effective equipment and consistent, unambiguous instructions.
- We have seen continued roll out of negative short-circuiting devices across DC traction areas as part of ESDP. The 'Safer Faster Isolations' programme is gathering momentum again, following pandemic delays. We attended

demonstrations of the use of mobile equipment to remotely operate switching gear.

- Traction Power Centralised Management System (TPCMS) continues to experience delays in its roll out. We have carried out work to understand how the situation will be recovered and to ensure that the risks from extended use of increasingly obsolete equipment are appropriately controlled. We have worked with our ergonomic experts to ensure lessons are learned from early installations, in order to optimise the interface between equipment and operator.

Mainline: Passenger Train Operating Companies

Figure 1.6 Composite of RM3 assessments for all passenger train operating companies



Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
SP1	Leadership	4	2	4
SP2	Safety policy	2	1	4
SP3	Board governance	4	2	4
SP4	Written safety management system	3	1	4
OC1	Allocation of responsibilities	3	2	3
OC2	Management and supervisory accountability	3	2	3

Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
OC3	Organisational structure	3	2	3
OC4	Communication arrangements	3	2	4
OC5	System safety and interface arrangements	3	2	4
OC6	Culture management	3	2	4
OC7	Record keeping	3	2	4
OP1	Worker involvement and internal cooperation	3	2	4
OP2	Competence management system	3	2	3
PI1	Risk assessment and management	3	1	4
PI2	Objective and target setting	3	3	4
PI3	Workload planning	3	2	4
RCS1	Safe systems of work including safety critical work	2	2	3
RCS2	Asset management (including safe design of plant)	3	2	4
RCS3	Change management (process, engineering, professional)	3	1	4
RCS4	Control of contractors	3	2	4
RCS5	Emergency planning	3	2	3
MRA1	Proactive	3	2	4
MRA2	Audit	3	2	4
MRA3	Incident investigation and management	3	2	4
MRA4	Review at appropriate levels	3	2	4

Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
MRA5	Corrective action and change management	3	2	4

Overview

1.94 This RM3 diagram summarises our determination of safety management maturity for all passenger operators from evidence collected in the past year only. Our evidence to support these assessments comes from all our interventions with operators including investigations, permissioning work and inspections. We have seen the following changes since last year:

(a) SP3 'Board governance': increased from Standardised to Predictable;

(b) OP1 'Worker involvement' and 'OC5 System Safety': decreased from Predictable to Standardised; and

(c) SP2 'Safety Policy' and RCS1 'Safe systems of work': decreased from Standardised to Managed.

1.95 Our inspection and investigation activities in the last twelve months can be defined by the following four risk areas:

(a) Management of rolling stock;

(b) Risk at stations;

(c) Operational Incidents (include Signals Passed at Danger – SPADs); and

(d) Worker health and safety (including managing the risk to workers from COVID-19, diesel engine exhaust emissions, electricity and construction site transport risk).

1.96 From our activities, evidence and findings we found common themes in passenger operator risk management, including:

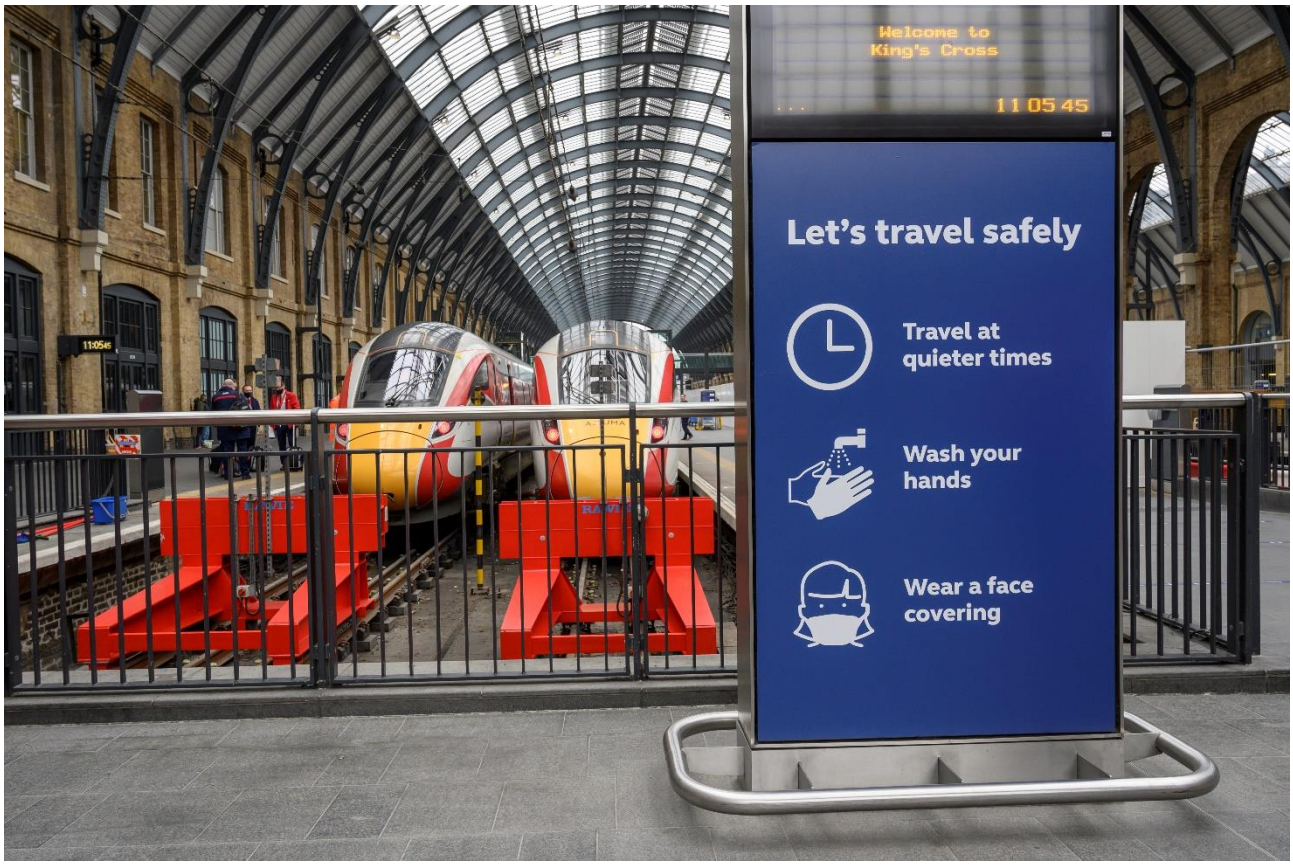
(a) Poor management of the risk from fatigue;

(b) Weak competence management for staff involved in safety critical work or making key safety decisions; and

(c) Improvement needed in assessing and managing the risk from organisational or engineering changes.

1.97 Throughout the past year, operators looked at opportunities to streamline their business and identify efficiencies to mitigate the effects on revenue, as passenger rail usage continued to be affected by the COVID-19 pandemic. We assessed the impact for the safety management systems for these operators. Passenger numbers are increasing and rail services returning to pre-pandemic frequencies. There are indications that this is putting employees into situations that they have not experienced since March 2020 for example, more trains and passengers on the network increases the likelihood of drivers being faced with a red signal and staff now dispatching trains on a crowded platform. The possibility of skill-fade means they are not prepared for these challenges.

1.98 This year we will continue to encourage operators to explore how technology can be used to improve risk control, particular in priority risk areas such as managing risks at the Platform Train Interface (PTI). We will also use our findings from this year's activities to ensure staff have the skills and are supported in such a way that work demands do not exceed human capabilities. We will also assess the impact of rail reform as passenger operators with franchising contracts under DfT move to concessions let by Great British Railways.



Evidence gathering and inspection activities

1.99 The evidence and activities associated with each of the four risk areas are set out in their own sections, which follow this RM3 overview. However, our work to assess the core Safety Management System (SMS) areas around the organisational structure to deliver safety and the adequacy of operator safety policies are described here.

1.100 Two operators recognised that they could introduce efficiencies in their businesses through sharing professional expertise, maintenance facilities or control room functions across operators in their respective owning groups. We found that, on two occasions, different operators had not determined whether the organisational changes they were proposing were 'substantial' (as defined by The Railway and Other Guided Transport Systems (Safety) Regulations 2006). This would trigger an assessment by ORR of the change and allow us to determine whether this affected the capability of the SMS to deliver safety and accept or reject the application. We have, formally, set out expectations to these operators of how they should manage future organisational changes.

1.101 We have taken a more critical appraisal this year of the content and quality of operator' safety policies. A health and safety policy sets out a duty holders' general approach to health and safety. It is essential for employees so they are provided with sufficient information, in an accessible format, to understand how their employer will manage health and safety in the business, setting out who does what, when and how. We identified that a number of operators needed to provide more detail in their policies on these arrangements and this has influenced our RM3 assessment for SP4 'Safety Policy'.

Management of rolling stock

Overview

1.102 In May 2021, the Hitachi Class 800 (AT300) trains were withdrawn from service because of cracking in the vehicle bodies. This action was taken because of the risk that sections of the vehicles could become detached, affecting the vehicle's structural integrity or the ride characteristics, with potential for a catastrophic event such as a derailment.

1.103 We undertook a safety review into the cracking and published our report into the lessons learnt in April 2022.

1.104 Inspection and maintenance regimes are critical to the control of risk associated with rolling stock. With the Class 800 trains, this ensured that stringent mitigation measures were put in place to allow the trains to re-enter service without passenger safety being compromised. This has ensured no safety failures and trains have performed as specified while in service.

1.105 With the introduction of new train fleets, maintenance is now commonly undertaken by the manufacturer or supplier. This has been a significant change for most operators, where formerly they undertook maintenance activities and could readily complete safety assurance, this is now more challenging with complicated contractual arrangements in place. This has been an important area of inspection

of our two year inspection programme looking at rolling stock asset management with all passenger operators, which commenced in April 2021.

1.106 This programme also included:

(a) assessment of risk from the introduction of new trains or changes to trains, including software upgrades; and

(b) progress made to eliminate the risk from droplight windows, where passengers lower a window to reach an external door handle, and with the programme to modify inter-vehicle connectors, mitigating the risk of people climbing on to train roofs or train surfing.

1.107 Three improvement notices were served in the last year, all associated with controlling the risk from legionella in on-train water systems.

1.108 Looking forward to our work in the next year, our priority will be oversight of industry work to act on the learning points we identified in our review into Hitachi AT200 and AT300 cracking. We will continue with our rolling stock asset management work and focus on change management in electronic and software systems. We will work with industry to evaluate the additional risk to passengers and staff associated with the operation of vehicles which entered service before modern crashworthiness standards were introduced in July 1994.

Evidence gathering and inspection activities

1.109 Our safety lessons learnt review into the cracking on Hitachi Rail Class 800 series commenced in May 2021. The trains then operated by Great Western Railway, London North Eastern Railway, Trans Pennine Express and Hull Trains were withdrawn from service for safety checks. Our review also considered similar cracking identified during examinations of other classes of Hitachi trains operated by ScotRail (Class 385) and Southeastern (Class 395).

1.110 When cracks were found on the bodyshell (yaw damper bracket and anti-roll bar fixing points) of some trains, rigorous safety checks by Hitachi Rail and the train operators impacted were carried out, with oversight from ORR.

1.111 Our review:

(a) determined the root cause of the cracking at the lifting end of the bolster and around the yaw damper and anti-roll bar connections to the body;

(b) examined how the industry went about identifying the problem, assessing the safety risk, withdrawing the trains from service and returning trains to service; and

(c) identified areas for improvement.

1.112 To ensure further safety improvements, ORR is recommending that:

(a) The industry should conduct further work to identify the reasons for the higher levels of fatigue loading experienced by rolling stock. Since the Hitachi Rail design complied with the applicable industry standards, the industry as a whole should evaluate whether the applicable standards take into account the loads arising from operation on the rail network in Great Britain. This industry collaboration will require the involvement of those parties responsible for design, manufacture and maintenance of rolling stock including, but not limited to, Hitachi Rail.

(b) Hitachi Rail should carry out a formal review of the effectiveness of their processes for welding when the component geometry is more challenging, which should include consideration of whether the existing approach adequately mitigates the risks of a weld with insufficient fusion being accepted.

(c) Designers of rolling stock should understand the risk posed by stress corrosion cracking and give it specific consideration when proposing the use of 7000 series aluminium components. This does not mean that the specific type of aluminium should not be used in future, or that the aluminium used in

the current trains compromises safety; but when used, steps should be taken to ensure protection of structures.

(d) The industry should consider whether a standard for mitigating SCC risk should be developed, as no dedicated standard currently exists.

(e) The industry should develop a process for responding to similar future cross-industry crisis events and appoint a strong, independent chair who can maintain pace, focus and ensure all voices are heard.

1.113 In April 2021, cracks were also found in the yaw damper assemblies on rail vehicles built by the train manufacturer CAF (Construcciones y Auxiliar de Ferrocarriles). Class 195 and 331 trains were urgently inspected after the failure of the weld holding a yaw damper bracket in place on one vehicle and 22 trains were immediately withdrawn from service. Following investigation and analysis, the highest risk was identified with Class 195 trains. A temporary solution has now been fitted to these trains with a programme to implement a permanent repair now underway. We have been fully engaged with the operator and CAF over this issue and the similarities with the cracking on Hitachi trains informed our safety review and improvements we identified for the industry.

1.114 This year we commenced a two year programme looking at all passenger operators' arrangements for management of their rolling stock assets. This covers introduction of new trains, modifications to existing vehicles and capability to carry out maintenance. This year for the operators inspected we found:

- All operators have effective arrangements in place to manage safety critical maintenance activities, with competence management in line with our guidance on 'Developing and Maintaining Staff Competence (Railway Safety Publication 1)'.

- Routinely, that trade union safety representatives play an active role in ensuring any concerns are raised directly with management. Occasionally, these are then escalated to us for support where resolution has not been achieved, for example, over the health risks of diesel engine exhaust emissions (DEEE). This has influenced our assessment of RM3 maturity for OP1 'worker involvement' which we have dropped to 'standardised' this year.

- Some operators are still failing to undertake a suitable and sufficient assessment of the risk from introducing new trains or transferred trains to their routes over issues including compatibility with the infrastructure, evacuation in an emergency and safe dispatch.

- Operators need to address a lack of in-house expertise in software and electronic systems so they can make an effective assessment of the risk of changes proposed by suppliers. Change management processes frequently do not allow sufficient time for this assessment to be completed before the changes are made, putting pressure on reviewers and the possibility that a detrimental safety implication is missed.

- Good progress with introduction of design solutions to mitigate the risk of climbing and surfing on trains, with the completion of Hitachi's programme to modify inter-vehicle connectors on the Class 800 trains operated by LNER. We will now be looking for this work to be implemented quickly on the trains operated by GWR, alongside the modifications being made for the cracking issues. Other manufacturers such as Stadler have also completed work to retrofit vehicles with anti-climbing measures.

- That, where train maintenance is delivered by manufacturers' suppliers, this has challenged the way operators obtain assurance that trains released to them are safe for service. This has led to tensions between operator and maintainer, typically over prompt access to information. The excellent collaboration that occurred between all parties over the crisis with the Class 800 cracking is less common between operator and maintainer in 'business as usual' assurance activities. Whilst contractual arrangements are not straightforward and this has an impact, we are satisfied that operator assurance is robust, but this lack of collaboration is a disappointing challenge.

1.115 We received a complaint from the National Union of Rail, Maritime and Transport Workers (RMT) about management of legionella in water systems on Govia Thameslink Railway (GTR) Class 700 trains. We investigated and served an Improvement notice on GTR, as we found that they had not prevented or adequately controlled the risk of exposure to legionella bacteria on 4 classes of train. We extended the scope of this work to other operators and found similar deficiencies in Chiltern Railways' management of legionella and served two Improvement notices .

1.116 We have continued work with passenger and charter operators to mitigate the risk to passengers using doors with droplight windows, where passengers need to lower a window and operate an external handle to open the door. Mainline passenger operators have now substantially reduced this risk by replacing or modifying vehicles with technological solutions, such as reconstruction with sliding doors or fitting window locks. The charter sector has undertaken work to understand this risk and identify solutions, with modifications now underway by some operators.

1.117 The charter operators have exemptions in place, from regulations 4 and 5 of the Railway Safety Regulations 1999, to operate Mk1 type rolling stock on the mainline until March 2023. In July 2021, following industry consultation and the production of an accompanying impact assessment, we published our updated Railway Safety Regulations 1999 - Guide to operation of Mark 1 type and hinged door rolling stock . This sets out key activities which must now support future exemptions, including:

(a) inspection and maintenance regimes to demonstrate that measures in place for crash protection are maintained to an acceptable standard; and

(b) central door locking on vehicles with hinged doors, which should also look to mitigate the risk from droplight windows.

1.118 We have worked extensively with the charter sector, directly with operators and through RSSB's Heritage Trains Risk Group (HTRG), to ensure that future exemptions to allow operation of relevant stock after March 2023 align with the requirements from our updated guidance. We have already inspected work to retrofit stock with central door locking and window bars and note the excellent work by HTRG to produce a guidance document on the inspection, maintenance and repair of Mk1 type rolling stock.

1.119 In its report into the derailment of a passenger train at Carmont, Aberdeenshire, RAIB have made recommendations around elements of the train design and evaluating the risk to passengers and staff from continued use of rail vehicles which were introduced before modern crashworthiness standards were introduced in 1994. We brought the industry together to enable them to carry out a review; RSSB is providing support to this work.

Risks on stations

Overview

1.120 This year, we have undertaken a range of activities associated with risk at stations. Management of risk at the platform-train interface remains one of our top safety priorities and we have focused on two key areas this year; falls from platforms and train dispatch.

1.121 In February 2021, RAIB made a number of recommendations in its report into a visually impaired person who died when he fell from the platform at Eden Park station and was struck by a train in February 2020. Tactile surfaces, which warn visually impaired people that they are approaching the edge of a platform, were not installed at Eden Park.

1.122 Through our oversight of progress against recommendations, we can report that Network Rail and DfT are progressing a timebound action plan to install tactile

surfaces at all stations in England, Scotland and Wales. This work will be risk prioritised and completed by March 2029. However the work is already progressing at pace and Network Rail report that the majority of locations will be fitted with tactile surfaces by March 2025.

1.123 Following our inspections, we have challenged duty holders to improve maintenance of visual warnings and install physical barriers, where reasonably practicable, to mitigate the risk of falling from platforms.

1.124 This year, on a case-by-case basis, we have investigated potential breaches of operators' legal duties in respect of defined accessibility requirements. Our intervention has led to improvements including Liphook station becoming fully accessible. As new rolling stock is introduced, we have seen further extension of Driver Controlled Operation (DCO) across the network. This method of dispatch minimises the number of people involved in the decision-making process to safely dispatch a train from a station, reducing the risk of human error.

1.125 In the coming year, we will maintain oversight of the national fitment of tactile surfaces now being managed by Network Rail under its 'Access for All' programme. Through industry groups, we will set out our expectation that operators undertake a review of locations and embark on a programme to fit physical barriers to prevent falls from platforms that are no longer used by trains. Through the same groups, we will encourage operators to be innovative and seek out technology to support train dispatch, where driver DCO is not currently the method of dispatch.

1.126 Where appropriate, we will continue to investigate accessibility cases where a passenger has not managed to secure resolution with operators.

Evidence gathering and inspection activities

1.127 In their report into passenger fatality at Eden Park, RAIB recommended that DfT and Network Rail develop a risk-based programme to install tactile surfaces across the UK rail network.

1.128 Some operators took over management of the station assets on franchise award, and these arrangements continued with the move to a National Rail Contract. They now have responsibility for maintenance and renewal of the stations, which includes work to platforms, where previously they undertook repair and light maintenance only. One of these operators (Greater Anglia) looked at alternative solutions to the traditional concrete tactile paving which requires significant work to install on a platform. With technological advance in materials and adhesives, the chosen solution utilised a thin tactile panel that is bonded to the platform surface. This enabled Greater Anglia, expedited by in-house asset management, to undertake a rapid programme of installation and 75% of the platforms it manages are now fitted with tactile paving.

1.129 The option of bonding tactile surfaces to platforms has now been incorporated into the national fitment programme, now managed by Network Rail for all stations in England, Scotland and Wales. Capturing this innovative solution means that 98% of platforms on stations managed by Southeastern have now been fitted with tactile surfaces. We will continue to monitor progress by Network Rail of the fitment of tactile surfaces and ensure the current pace of installation is maintained.

1.130 Through our inspections, we have challenged operators to improve maintenance regimes where we see faded or missing warnings on platforms, such as yellow and white lines and warning messages. We are now seeing improvement in this area, but our inspections have highlighted a number of locations where platforms are disused, or the method of operation is such that trains do not stop on some sections of platform. At these locations, where it is reasonably practicable to do so, we expect to see physical barriers installed, to manage the risk of falls from height. In the next year, we will be looking for operators to review locations where physical barriers can be installed and initiate work to fit these, to manage this risk on stations. This will build on the extensive work already undertaken by Network Rail and operators to close off or install fencing along platforms adjacent to tracks that are only used by non-stopping trains.

Train dispatch

1.131 In 2017 we published our safety principles for Driver Controlled Operation (DCO). DCO is a method of working where the driver is responsible for door operation and determining that it is safe to start the train. New types of rolling stock are now fitted with equipment, including body-mounted cameras on each vehicle and in-cab monitors, which allow the driver to determine that it is safe for the train to leave. Other methods of dispatch include platform-mounted cameras and monitors to aid the driver or using safety critical staff on the platform to signal to the driver that it is safe to dispatch the train. However, we consider that the more people involved in determining that it is safe to dispatch a train, the more chance there is of failures in safety critical communications, human error or delay, and a dangerous situation developing.

1.132 This year, we have inspected the rollout of a new fleet of trains by one operator that will enable the operator to move from a mix of traditional methods of dispatch, using guards or DCO platform mounted equipment, to DCO using train-borne cameras and cab monitors offering high resolution images to support the driver. Additionally, these trains use trackside transponders to prevent the driver from opening the doors on the side of the train that is not adjacent to the platform, mitigating another risk at stations.

1.133 With such advances in technology, we now want to see the industry look at innovative ways of further improving risk control at the platform-train interface. We want to work with the industry and explore innovative technological solutions, that could be retrofitted to stations or trains, where DCO is not currently the method of dispatch. The aim of this activity should be to reduce the risk of errors in train dispatch, due to poor quality equipment, challenging platform curvature or human error by other staff involved in the dispatch process.

1.134 The opportunity should be taken to explore how technology could be used to enable the driver to monitor the platform train interface as the train departs, and any part of it is still next to the platform, and how staff on the platform could stop the train in an emergency.

1.135 We are also actively involved in industry groups such as RSSB's People on Trains and Stations Risk Group (PTSRG) and RDG's Passenger Operators Safety Group (POSG). Engagement through these groups is a really effective way of understanding the common issues operators face and for us to raise matters of concern in an open, learning environment. This drives a risk management approach for these issues which is common for all operators. Through the PTI working group, a sub-group of PTSRG, we have encouraged members to press forward with work to review the RSSB PTI Risk Assessment Tool, to look at how it can embrace good practice in PTI risk management methods developed by operators not currently using the tool, making it accessible to more operators. We will take part in industry workshops in 2022 aimed at progressing this review.

Accessibility

1.136 We have enforcement powers for accessibility requirements defined in legislation. For main line services these are imposed through the interoperability legal framework. The Interoperability framework has a direct relationship to safety, but has a wider purpose of ensuring technical compatibility, reliability, performance and accessibility of new or substantially modified rail vehicles or infrastructure. Where rail users encounter shortcomings in accessibility, they should first of all tell railway staff. The legal responsibility lies with the operator of the rail service, who should be given the opportunity to put things right.

1.137 In the event of an unsatisfactory response, there may be grounds for us to investigate a breach of legal duties. We would consider this in line with the enforcement expectations defined in our published Enforcement Management Model. We are empowered to enforce specific accessibility legislation using powers we have under the Health and Safety at Work etc Act 1974. A railway company that complies with the requirements that we enforce may, even so, not be doing enough to meet its responsibilities arising from the Equality Act 2010. We have no enforcement role for the Equality Act, although we have a duty to promote equality of treatment.

1.138 Network Rail proposed installing a new footbridge at Liphook station and applied to DfT for an exemption from the legal requirement to provide step-free access. This was on the grounds that passengers using a wheelchair were not able to travel to and from the station. The application asserted that step-free access would bring no benefit; DfT consulted us on the application. The accessibility legislation we enforce requires a boarding aid to be provided where passengers using a wheelchair cannot otherwise board or alight. It was therefore necessary to provide a boarding aid at Liphook. We objected to the application for an exemption because the grounds for not providing step-free access over the footbridge were not valid, so the exemption was not granted.

1.139 We investigated why the operator did not provide boarding aids, which led us to serve an Improvement notice on South Western Railway in 2020. In response, the company removed obstructions from the up platform, which made it possible to fit a ramp to the trains. The inaccessible footbridge was the only way to reach the down platform, so Network Rail opened the new footbridge in September 2021, with lifts to provide a step-free route. It is now possible for passengers using wheelchairs to travel to and from Liphook by train, whilst also providing ease of access for other passenger groups.

Liphook station –before station accessibility works

Liphook station –after station accessibility works

1.140 We have identified an emerging risk from the use of electric wheelchairs and mobility scooters on platforms. In separate incidents in March 2022, a passenger using a mobility scooter died at Folkestone Central and another passenger using an electric wheelchair at Kings Norton was taken to hospital, after they lost control and drove off the platform onto the track. We are investigating both incidents. We are working with ORR colleagues, accessibility groups, and with the industry, through PTSRG and POSG, to raise awareness of this issue and understand how the risk can be managed and vulnerable users supported.

Operational incidents (including SPADs)

Overview

1.141 This year we have maintained our proactive and reactive work around SPADs. A SPAD is a precursor to a hazard, such as train collision. We investigate all SPADs which have the potential to have a severe outcome and there were 10 of these events last year. RSSB uses these high risk SPADs to estimate the contribution that SPADs could make to the risk of collision. The baseline was set as 100% in 2006. By the end of March 2022, estimated SPAD risk was 33%, an increase from 26% in April 2021. There are indications that this increase is related to the

substantial increase in train movements compared with the same time last year when the UK was in pandemic restrictions; more trains on the network correlates with an increased likelihood that drivers will face a red signal.

1.142 The management of other operational incidents, particularly where trains have been stranded with passengers on board, is another area we have focused on this year. This is informed by our risk profiling work and our concern around the risk of passengers self-evacuating from a train stranded between stations for a long period.

1.143 Inspections around the management of operational incidents have looked at the capability of control room staff to manage emergencies, such as stranded trains or people who have become unwell on a train. The SPAD inspections this year looked at the capability of driver managers to undertake SPAD investigations and complete the workload assigned to them.

1.144 Across all operators inspected, two key area of weakness stood out from both of our inspection activities; management of the risk of fatigue and management of competence.

1.145 We found that management of the risk of fatigue was either not managed or was based on outdated principles. We identified a consistent theme with driver managers struggling because they report that the ratio of drivers to driver managers is too high and the consequent workload is too demanding.

1.146 We also concluded that training needs for staff managing incidents and for driver managers conducting SPAD investigations were, frequently, not defined or assessed.

1.147 We found that operators understood the benefits of non-technical skills and found good practice in embedding this knowledge in investigations, key to identifying underlying causes to drivers having SPAD incidents.

1.148 We found evidence that due to vacancies in driver manager posts not being filled, the workload is being shared. All operators need to ensure their staff are supported so work demands do not exceed human capabilities.

1.149 We are working with the operators inspected this year, identifying and monitoring progress with the actions we identified for them individually. We will share our overall findings from the past year with industry working groups such as RSSB's Train Accident Risk Group and RDG's Passenger Operator Safety Group. In the forthcoming year, we will undertake Management of Operation Incidents inspections with the operators where we didn't inspect this area this year. We will also progress to year two of our SPAD inspection programme.

Evidence gathering and inspection activities

1.150 This year, we undertook planned inspections of the management of operational incidents with half of the passenger operators. We will complete this inspection work with the remaining passenger operators in by the end of March 2023. The inspections were centred on the role of the passenger operators' control room staff and their capability in decision making and managing the dynamic environment of an emerging operational incident. We used recent operational incidents experienced by each operator to provide structure to our work, including:

(a) Stranded trains due to mechanical failure, shut down by software systems and loss of third rail or overhead electric supply.

(b) Incidents on stations and trains, including fire.

(c) Passengers taken ill on trains.

(d) Train collision/derailment.

1.151 Our significant findings were:

(a) Robust competence management systems that exist for other safety critical staff did not extend to control room and other staff making key safety decisions in incident management. Current arrangements for developing new staff rely on shadowing colleagues to gain knowledge, with self-learning to understand existing policies and procedures. However, training managers in one organisation recognised that they need to improve the level and quality of training to staff managing incidents. They are developing a training syllabus and using training needs analysis to identify gaps in competence. They will bring staff undertaking management of incidents within the competence management system. This will test and challenge individual capability and ensure personal development plans, supporting continuous professional development, are in place. We will monitor progress and encourage the organisation to share their work with other operators.

(b) We did not find evidence that organisations are testing their emergency plans through exercises involving emergency services and Network Rail. There was evidence of formal table-top scenario exercises, but not in all organisations. Staff were generally unfamiliar with the Joint Emergency Services Interoperability Principles (JESIP), which are used across emergency services to support incident management and decision making. We expect to see emergency plans tested to ensure the organisation's system and people are prepared for foreseeable emergencies. Operators need to make sure that all staff involved in emergency response are not overwhelmed, ensuring particularly that their people at the scene of an

incident are supported. Testing of emergency plans is an area where all passenger operators need to act.

(c) A common theme was poor management of the risk of fatigue for control room staff. We frequently found that processes either were not in place or were based on now outdated principles, recommended in the report by Sir Anthony Hidden QC investigating the Clapham rail crash, published in 1989. In 2012, ORR published Managing Rail Staff Fatigue and all operators should use this guidance to review how they manage the risk of fatigue for staff managing incidents.

Signals Passed at Danger (SPADs)

1.152 This year we also commenced a three year inspection programme looking at activities within all operators to minimise the risk of a driver passing a signal at danger. We concentrated on the capability of driver managers, looking specifically at their role in SPAD investigations and more generally at their management of drivers allocated to them. Where a SPAD is attributed to the actions of a driver, their driver manager will be responsible for completing the investigation. It is important that driver managers have the right competence through knowledge, experience and training to complete these investigations. This is so they can determine the correct underlying causes of a SPAD, so that the driver can be supported with appropriate activities and actions, reducing the likelihood of the driver having further SPADs. Therefore, our inspections covered:

- Recruitment and selection of driver managers;
- Vocational qualifications to carry out assessments of drivers;
- Training in SPAD investigation;
- Knowledge of industry good practice and SPAD performance;
- Assessment of driver manager workload; and
- How driver managers promote and encourage their drivers to self-manage their professional driver competence, for example through non-technical skills.

1.153 Our significant findings were:

(a) All operators recognise that awareness and assessment of non-technical skills are important in understanding why a driver had a SPAD and how they can be used as part of a development action plan arising from their investigations. We had evidence that some operators have procured non-technical skills targeted at supporting driver managers in their investigations,

and we highlight this as good practice. We noted that more operators are adopting the RSSB SPAD strategy and using tools such as the RSSB RAATS tool (Red Aspect Approaches to Signals). However, there are still some operators that have not yet aligned to the strategy or are not yet using supporting tools.

(b) LNER is in the early stages of trail-blazing an apprenticeship standard for driver managers, However, we commonly found a less structured approach to competence management for driver managers in other operators, particular around investigation. We found evidence in one organisation that driver managers had not received any training in SPAD investigation.

(c) We reviewed SPAD investigations undertaken by driver managers and frequently found that the impact of fatigue was superficially handled by the investigators. The out-dated approach of fatigue scores was the typical approach. The impact of fatigue should compare work patterns against good practice and include feedback from the driver on how fatiguing they find their work pattern, as there may be factors outside of work that need to be considered. ORR published our guidance 'Managing Rail Staff Fatigue' in 2012.

(d) In interviews with driver managers, there was a consistent theme that the ratio of drivers to driver managers was too high, and the consequent workload was too demanding. We repeatedly found operators were carrying vacancies for driver managers, with that work then necessarily spread to others, who may not even be based at the same depot as the drivers they were managing. Operators need to review or undertake task-based risk assessment for their driver managers roles, this should draw on good practice in managing fatigue and human factors, to ensure that work demands do not exceed human capabilities.

(e) With COVID-19 social distancing restrictions, driver managers did not observe drivers on assessments, in-cab. Other methods were used to assess driver competence. Restrictions on more than one-person in the cab were lifted in summer 2021, however we found some operators were not back on programme with these important observational assessments. This needs to be actioned promptly, to ensure that drivers are supported in their continued professional development.

1.154 Over the next two years, we will be looking in more detail at driver self-management, competence management systems, using outputs from on-board systems as part of driver assessment and how knowledge of the infrastructure, such as route-learning, is managed.

Workforce health and safety

Overview

1.155 Over the next two years, we will be looking in more detail at driver self-management, competence management systems, using outputs from on-board systems as part of driver assessment and how knowledge of the infrastructure, such as route-learning, is managed.

1.156 Operators continued to implement controls for managing risks from COVID-19 to staff and kept in step as government guidance imposed and relaxed restrictions, throughout the past year. We again worked with the industry through the Rail Industry Coronavirus Forum (RICF), to ensure guidance was in place to maintain a common approach to controls across the network and we published a revised guidance document in July 2021, setting out principles for reviewing controls. The outstanding level of collaboration between operators and trades unions has driven the successful introduction, maintenance and relaxation of COVID-19 risk controls, maintaining a safe workplace.

1.157 The pandemic has had a secondary impact on health and safety risk control. Workplace absence as a result of staff self-isolating or shielding, as well as the periods where advice drove increased working from home, has impacted on operators' ability to support staff. This has led to reduced on-site supervision and delivery of key requirements of the safety management systems, such as safety inspections and audits. Operators have reported increased violence to their staff from passengers and members of the public, as activities such as revenue protection were reinstated. As passenger numbers have increased, there has been evidence of skill-fade for employees who have become unfamiliar with dealing with crowds. This has led to incidents, for example when dispatching trains.

1.158 We commenced three investigations, one into the death of a train driver, where staff were at risk from being struck by a train or from coming into contact with the live third rail. In two of the incidents, we found that staff were unfamiliar with arrangements to protect themselves.

1.159 We have again found issues with the control of contractors, serving one Improvement notice on this area around failure to supervise construction site activities putting both workers and the public at risk.

1.160 Over the next year, we will be focused on ensuring that staff are supported in their roles through effective on-site supervision and management. Operators need to review training needs and ensure their staff are competent to work safely and deliver safety risk controls, particularly where there is a possibility of skill fade as employees have not been exposed to activities where they need to deal with high volumes of passengers during the pandemic restrictions.

Evidence gathering and inspection activities

1.161 Throughout the past year, inspectors have worked with operators as they have transitioned out of COVID-19 restrictions. We urged caution when removing controls, as new variants of the virus circulated. We worked in a highly effective collaborative way with trades unions, operators and Network Rail, through RICF, to revise guidance to support stepping back from the COVID-19 risk controls. The guidance aimed to drive a cross-network approach to the relaxing of controls, so that passengers and staff would be familiar with the controls in place at the time and the expectations of them, wherever they worked or travelled on the network. The guidance included:

PRINCIPLE A: Using risk assessment to review COVID-19 risk controls following changes to government guidance and legislation;

PRINCIPLE B: Maintaining plans to react and adapt, keeping pace with government measures and scientific research, to control COVID-19 transmission; and

PRINCIPLE C: Collaboration between duty holders and with trades unions and employees.

1.162 We published these principles in July 2021, and they were welcomed by rail duty holders as providing a clear expectation from the regulator on adapting risk control, as information and intelligence on the virus evolved. These principles remained in place until new COVID-19 guidance was introduced in early 2022.

1.163 The pandemic has had a significant impact on staff absence, with individuals either self-isolating or shielding. This has put a strain on delivering key activities in both operation, maintenance and back-office functions. We have investigated isolated examples where staff absence has impacted on safety, for example one operator failing to provide continuous supervisor cover at one of its major terminals therefore impacting its ability to manage any emergency situation.

1.164 We are an active member of Rail Delivery Group's Passenger Operators Safety Group. Through information shared at this group, and through our inspections and liaison meetings, the industry is reporting an increase in verbal and physical assaults to rail staff from members of the public and passengers. There are indications that the increase is related to behaviours, such as travelling without a ticket, not being challenged through the pandemic. Now revenue protection activities have stepped up and, with higher numbers of commuters not prepared to tolerate socially unacceptable behaviour, this is bringing conflict. At the end of May 2021, a revenue protection officer was stabbed at Bromley South station when challenging a 17–year old male, while two other members of staff were also injured.

1.165 In our COVID-19 principles we said that duty holders should check that there has not been skill-fade for employees, in managing situations which they may not have had to deal with since the start of the pandemic. Employees need to be supported, ensuring they still understand what they need to do to manage risks, such as crowding, and managing their own health and safety during activities such as undertaking revenue protection.

1.166 Through our inspections, we have found that COVID-19 restrictions and staff absence has also created a backlog in senior leaders' safety inspections, competence management activity and the monitoring and audit of health and safety risk controls. All operators should now ensure that they follow through on these activities, set out in their safety management system, as they are key to validating the risk control arrangements.

1.167 We have also investigated two incidents where workers put themselves at risk from being struck by a train or coming into contact with live electric rails. In one incident a member of station staff at Aldrington, East Sussex accessed the electrified track to recover an item, without securing protection. In the other incident at Eccles, Greater Manchester there was a near miss with a passing train when two contractors were repainting the white line on the platform edge. Both incidents demonstrate that the relevant operators did not ensure staff or contractors had the necessary competences for the activities they undertook. In the Eccles incident, resources were not available for checking on the contractors and the operators' property team did not fully understand the internal procedures for the activity.

1.168 Following a complaint, we investigated the failure, by a principal contractor, to manage construction activities being undertaken by a sub-contractor at Hartlebury station; the movement of construction vehicles was introducing a risk to workers and the public. An Improvement notice was served on the principal contractor, Dyer and Butler, on 10 February 2022 and was complied with by 7 March 2022.

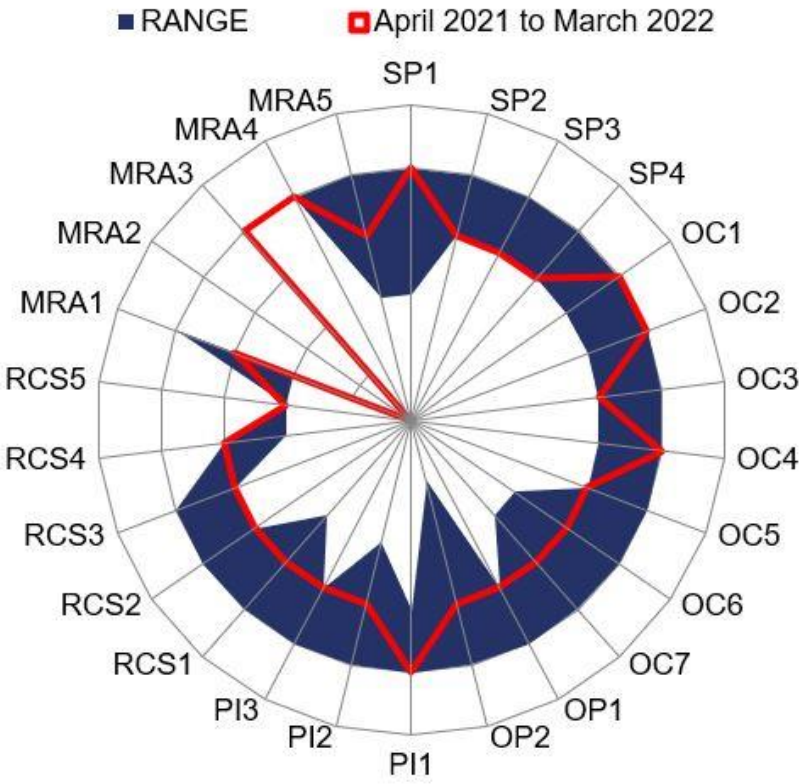
1.169 Trade unions have again raised issues with inspectors, where they have been unable to achieve resolution on matters locally with managers. We are committed to support safety representatives and will continue to improve our arrangements to increase our interactions with these important stakeholders.

1.170 Through a planned inspection at one depot in Cornwall and investigation of a matter raised by a trade union safety representative at another location in Leeds, we have again raised concerns over management of Diesel Engine Exhaust Emissions (DEEE). We are working with these operators to manage the risks to health from DEEE by reviewing the effectiveness of the local exhaust ventilation. We have also been informed by a safety representative of musculoskeletal disorders, which are similar in a number of staff, and may be related to the driving position when observing platform monitors. The operator is looking to a

technological solution and is committed to the fitment of Driver Controlled Operation (DCO).

Mainline: Freight Operating Companies

Figure 1.7 A composite RM3 assessment of freight operating companies' management maturity in 2021/22



Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
SP1	Leadership	4	2	4
SP2	Safety policy	3	3	4
SP3	Board governance	3	3	4
SP4	Written safety management system	3	3	4
OC1	Allocation of responsibilities	4	3	4

Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
OC2	Management and supervisory accountability	4	3	4
OC3	Organisational structure	3	3	4
OC4	Communication arrangements	4	3	4
OC5	System safety and interface arrangements	3	3	4
OC6	Culture management	3	2	4
OC7	Record keeping	3	2	4
OP1	Worker involvement and internal cooperation	3	3	4
OP2	Competence management system	3	1	4
PI1	Risk assessment and management	4	3	4
PI2	Objective and target setting	3	2	4
PI3	Workload planning	3	3	4
RCS1	Safe systems of work including safety critical work	3	2	4
RCS2	Asset management (including safe design of plant)	3	3	4
RCS3	Change management (process, engineering, professional)	3	3	4
RCS4	Control of contractors	3	2	3
RCS5	Emergency planning	2	2	2
MRA1	Proactive	3	2	4
MRA2	Audit	No score	No score	No score
MRA3	Incident investigation and management	4	4	4

Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
MRA4	Review at appropriate levels	4	4	4
MRA5	Corrective action and change management	3	2	4

Overview

1.171 Our assessment of the freight sector's health and safety management capability during last year shows that the sector as a whole is performing at a standardised level. This year we have seen the following changes in the sector's mean performance:

SP1 'Leadership': increased from standardised to predictable.

OC1 'Allocation of Responsibilities': increased from standardised to predictable.

OC2 'Management & Supervisory Accountability': increased from standardised to predictable.

OC4 'Internal Communication Arrangements': increased from standardised to predictable.

PI1 'Risk Assessment': increased from standardised to predictable.

MRA3 'Incident Investigation': increased from standardised to predictable.

MRA4 'Management Review': increased from standardised to predictable.

SP2 'Safety Policy': decreased from predictable to standardised.

RCS5 'Emergency Planning': decreased from standardised to managed.

1.172 We also identified a considerable range of duty holder capability in the key risk control of competence management (OP2).

1.173 Our planned work for 2021/22 has been defined by the following risk areas:

- Operational Incidents (including Signals Passed at Danger- SPADs).
- Rolling Stock Asset Management.
- Occupational Health.

1.174 The evidence used to inform our assessment has come from all our interventions with the freight sector, including investigations, permissioning work and inspections.

Evidence gathering and inspection activities

1.175 As the freight sector continues to recover from the impacts of the pandemic, our proactive work looked at the industry's arrangements to control train accident risk, with specific inspections examining the management of SPADs and rolling stock asset condition. We also completed a targeted inspection programme that looked at how FOCs ensure that mobile staff are provided with access to welfare facilities.

1.176 We have continued to engage with industry working groups, including the National Freight Safety Group, where collaboration between otherwise competing duty holders is continuing to bring benefits in the management of sector-wide risks. We also held regular liaison meetings with the Network Rail Freight and National Passenger Operators team and contributed to our wider work with freight customers, including hosting a dedicated workshop on our new level crossing guidance for freight end users who operate their own railway infrastructure.

1.177 During this year we intend to continue our work examining freight duty holders' SPAD management and rolling stock maintenance arrangements.

Operational incidents – Signal Passed at Danger

Overview

1.178 SPADs are one of the potential precursors to train accidents. The role of the driver manager is critical to duty holders' mitigation of SPAD risk through both the investigation of incidents and the wider management of traincrew.

1.179 Our inspection work focused on FOCs' arrangements for driver manager competence, specifically relating to SPAD investigation and the definition of subsequent actions and improvement plans for drivers. Generally, we found that duty holders had appropriate arrangements in place for the management of driver manager competence, although FOCs could better document their recruitment and training requirements for this role. Excessive driver manager workload was identified as a common theme across all FOCs and has the potential to reduce the effectiveness of duty holders' SPAD risk control arrangements.

Evidence gathering and inspection activities

1.180 Our inspections formed part of a three year programme of work looking at all mainline operators' arrangements for the management of SPAD risk. During the last year, we examined how duty holders ensure the competence of river managers, with a specific focus on the investigation of SPADs.

1.181 We intend to continue this work over the next two years and will focus on how duty holders use both competence management systems to effectively manage SPAD risk, as well as on-board systems to monitor driver performance. We will also examine how duty holders identify where infrastructure conditions may affect driver performance.

1.182 We examined the arrangements duty holders had in place for the recruitment, selection and training of driver managers. Inspectors found evidence of duty holders using a structured approach to recruitment and training, including the use of external training providers to deliver specific investigation and assessment training. One FOC has appointed a specialist investigator to lead complex investigations and provide additional training to new and existing driver managers. We also found that training for new driver managers at one duty holder appeared to be disjointed and somewhat reliant on support from experienced driver managers. At another operator, the recruitment and selection processes for driver managers were not as well documented as for other operational roles.

1.183 SPAD investigations and resulting action plans were also examined as part of the inspection. We found that these were generally found to be of a high standard across all duty holders and incorporated industry-recognised SPAD investigation techniques. Action plans resulting from investigations were incident- specific and linked to individual driver competence records and the wider competence

management system. However, it is apparent that the quality of SPAD investigations is linked to the workload of driver managers.

1.184 The nature of freight operations means that FOC staff responsible for driver management also have other responsibilities. Whilst the specifics vary between operators, we found that driver managers were also responsible for the management of other grades of operational staff, safety at operational sites and elements of service delivery. Furthermore, in some parts of the country driver managers were responsible for managing staff over large geographic areas. At one FOC, inspectors found that driver managers were routinely being used to cover unfilled driving turns.

1.185 Given the importance of the driver manager role in individual duty holders' arrangement for the management of SPAD risk, it is therefore essential staff carrying out this role are afforded sufficient time and resources to undertake their role effectively.

Rolling Stock Maintenance

Overview

1.186 The management and maintenance of rolling stock assets is a critical risk control for freight duty holders. The failure to maintain rolling stock in a safe condition has the potential for catastrophic consequences, as illustrated by the August 2020 derailment and fire of a train carrying dangerous goods at Llangennech, South West Wales.

1.187 Over the last year we have continued to work alongside the RAIB and other investigating authorities to understand the causes of the Llangennech derailment. We commenced a programme of inspection to examine how the freight sector is managing rolling stock maintenance activities, with a specific focus on the maintenance of brake components.

Evidence gathering and inspection activities

1.188 On 26 August 2020, a freight train conveying petroleum products derailed at Llangennech between Llanelli and Swansea. A number of the wagons subsequently caught fire and over 300,000 litres of fuel escaped, causing significant pollution to a nearby Site of Special Scientific Interest. The railway infrastructure also sustained considerable damage leading to extended disruption to passenger and freight services while repairs were completed. The investigation of the incident subsequently revealed that a possible cause of the derailment was the failure of a brake component on a wagon. The incident ultimately highlights both the catastrophic consequences that can result from freight train derailment, as well as the importance of ensuring that rolling stock is maintained in a safe condition.

1.189 The freight sector uses a variety of different operating models for the maintenance of rolling stock, reflecting the diverse nature of the sector. These range from maintenance undertaken by FOCs directly, by vehicle lessors or contracted to third parties. Our inspection work has therefore examined rolling stock maintenance activities undertaken by FOCs, Entities in Charge of Maintenance (ECM) and third-party maintenance providers. We have focused our attention on how duty holders manage the maintenance of brake system defects, ensure that vehicles are safe to re-enter service following maintenance and how fleet performance is monitored to identify potential defects. We intend to continue this work over the next twelve months in order to gain a full view of the freight sector's capability in this area.

1.190 Our inspections to date have found that the duty holders inspected have arrangements in place to manage the risks associated with rolling stock defects that are appropriate to the operating model employed by each duty holder. We found examples of duty holders adopting good practice with regards to rolling stock maintenance. These included the use of barcodes to track repairable components during fitting and the repair process, as well as robust feedback mechanisms between FOCs and ECMs on wagon fleet condition, the results of vehicle exams and the development of maintenance standards.

1.191 The competence of staff involved in rolling stock maintenance was generally well managed across all duty holders, although there is room for improving the definition of competence requirements; the requirements for artisan staff undertaking maintenance activities tend to be better defined than those for staff making technical decisions relating to vehicle maintenance and fleet management.

1.192 We note the conclusions of RAIB's report into the Llangennech derailment and will be working with the freight sector over the next year to address the recommendations made in the investigation report. One of RAIB's observations was around the absence of oversight of non-domiciled ECMs' British operations by overseas certification bodies. It was therefore reassuring to see that inspectors found one non-domiciled ECM that had made arrangements with a domestic certification body to undertake an additional assessment of the ECM functions carried out in Britain to assure themselves that maintenance was being carried out in accordance with both the ECM regulations and current domestic practice.

1.193 It is pleasing to see that the freight sector continues to adopt a collaborative approach to the management of sector-wide risks. The National Freight Safety Group's "Condition of Freight Vehicles on the Network" workstream will assist the freight sector in identifying the most effective risk controls and facilitate the sharing of best practice around the rolling stock maintenance and train preparation.

Access to Welfare Facilities

Overview

1.194 The nature of freight operations means that many frontline staff in the sector, such as drivers and ground staff often undertake duties where they may have limited access to welfare facilities. Staff that are tired or have been unable to use the toilet may be more likely to make an error at work, increasing the risk of a safety-related incident.

1.195 We inspected all FOCs' arrangements for ensuring that mobile staff were provided with access to toilet and rest facilities. We found that all duty holders had processes in place to identify suitable locations for staff to access welfare facilities. However, it was concerning to find examples of staff still being forced to relieve themselves at the side of the track. Staff access to welfare facilities is not an issue that is unique to the freight sector and is an area where the whole industry needs to improve.

Evidence gathering and inspection activities

1.196 Although the Workplace (Health, Safety and Welfare) Regulations 1992 specifically exclude locomotives and rolling stock from scope, employers are still expected to comply with the duties set out in the Health and Safety at Work etc Act 1974 to take reasonably practicable measures to ensure the welfare of their employees at work. The law also requires specific welfare arrangements to be provided where employees work with hazardous substances.

1.197 Our inspection work involved site visits and interviews with staff from all FOCs. We spoke with operational grades, as well as staff responsible for rostering and planning, health and safety and operational management. We also consulted trade union health and safety representatives as part of this work.

1.198 All duty holders had risk assessments, policies and procedures in place relating to the provision of welfare facilities. However, we found that duty holders typically relied on organisational controls to identify suitable locations where operational staff could use welfare facilities. In some cases, this included facilities at stations, terminals or third-party sites such as service stations or shops. Where duty holders select third-party sites as welfare locations, this should be formally agreed with the facility operator and inspected to ensure that they are fit for purpose.

1.199 We found inconsistencies in how duty holders planned personal needs breaks for operational staff. One FOC had implemented a planning and rostering system that identified suitable locations for staff to take breaks and use toilet facilities. However, we also found examples of rosters where operational staff were scheduled breaks at locations with no facilities or were expected to travel some distance to use them.

1.200 It was concerning to note that in certain parts of the sector there remains an element of cultural acceptance amongst staff that it is "part of the job" for them to relieve themselves at the side of the track. This is unacceptable and highlights why the rail industry needs to improve welfare provision for operational staff.

1.201 The introduction of new freight locomotives provides an opportunity for duty holders to re-examine the feasibility of the provision of on-board welfare facilities. In the short-term, we expect duty holders to continue to explore alternative solutions including temporary and emergency welfare provision for operational staff.

1.202 The work of the industry's rest facilities steering group, which brought together representatives from across the wider rail industry, has resulted in the publication of the document 'Guidance on the Provision of Toilet Facilities on Great Britain's Railways'. The guidance offers practical support for bringing about improvements in this area and ORR recommends its use by all duty holders.

1.203 Collaboration between duty holders in the freight sector has previously shown that the industry can effectively manage system-wide risks. This is an area where a collaborative approach across the wider industry can continue to bring about improvements to people's health, safety and dignity.

Trespass at Freight Depots and Sidings

Overview

1.204 Duty holders are required by law to take reasonably practicable measures to prevent unauthorised access to infrastructure under their control. Where organisations fail to meet this standard, we will take enforcement action. In 2021 we concluded our prosecution of a rail freight terminal operator following a serious incident that occurred at their site in 2017.

Evidence gathering and inspection activities

1.205 In July 2021, the operator of the Daventry International Rail Freight Terminal (DIRFT), WH Malcolm Ltd was given a £6.5 million fine at Northampton Crown Court after being found guilty by a jury of two health and safety offences.

1.206 This followed a prosecution brought by ORR after an incident in 2017 where an 11 year old child was fatally injured at DIRFT, after easily gaining access to the site in order to retrieve a football. Once on site they were able to climb on top of a stationary freight wagon and received a fatal electric shock from the overhead line.

1.207 Our investigation found that WH Malcolm Ltd had not only failed to assess the risk of unauthorised access but also failed to put in appropriate measures to part of the site where there were frequent train movements and overhead line equipment

energised at 25,000 volts. Furthermore, the company were found to have ignored previous warnings from staff and others about the risks of trespass.

1.208 The £6.5 million fine, which was upheld by the Court of Appeal in April 2022, is one of the largest ever levied by the courts in a health and safety prosecution.

Transport for London (TfL)

Overview

1.209 The COVID-19 pandemic continued to have a significant impact on the capital's public rail network controlled by Transport for London (TfL) which includes London Underground, the Docklands Light Railway (DLR), London Overground, TfL Rail and Rail for London Infrastructure ((RfLI) on the Elizabeth line).

1.210 With the gradual lifting of all COVID-19 restrictions during the year, passenger demand (in particular on London Underground) steadily increased towards pre-pandemic levels. However, December and January saw slight drops in passenger numbers due to the prevalence of the more transmissible 'omicron' variant of COVID-19.

1.211 TfL's management of response to frequently changing guidelines with respect to the pandemic was robust and dynamic, as we also recognised in last year's report. In keeping with Government policy and guidance, many of the COVID-19 controls put in place by TfL have now been removed, except where there continues to be an assessed need, or it provides additional improvement.

1.212 There were no reported workforce fatalities across TfL in connection with their railway operations in the last twelve months. There were however two reported passenger fatalities on the London Underground network, which through our enquiries to date have revealed no material breaches of health and safety legislation.

1.213 TfL continues to work on delivering significant developments to meet ongoing challenges, including work on the one of the biggest and most complex railway signalling upgrade projects, the Four Lines Modernisation programme, across the Circle, District, Hammersmith and City and Metropolitan lines. This is in addition to a programme of updating rolling stock on the DLR, London Overground and bringing new trains to the Piccadilly line.

1.214 These projects form part of the pan TfL modernisation programme, which also included the recent restructure of the TfL Commissioner's Executive team and other ambitious change programmes across London Underground, TfL's largest rail operation.

1.215 All TfL Rail duty holders continue to demonstrate operations in the managed to standardised ranges.

1.216 We will undertake further work to evidence management maturity levels through our proactive activities in the coming year, with a focus on monitoring and assessing the adequacy of TfL's management of their large-scale modernisation and change programmes. Given this context, it will be essential for TfL to ensure that it is not distracted from the day job of ensuring the safe operation of the capital's rail network.

London Underground

Overview

1.217 London Underground has continued to deliver a sound level of safety for the travelling public and its workforce throughout the past year, despite increasing pressure associated with funding.

1.218 We continued to monitor London Underground's strategic approach towards asset management to gain assurance that its essential investment in renewals and capital investment activities appropriately considered asset condition, performance, whole life cost and safety risk. We established that whilst London Underground were able to demonstrate prioritisation of asset interventions, these were vulnerable due to the quality of data available.

1.219 There is also significant change ahead through London Underground's planned modernisation programme and it will be essential for their planning arrangements to incorporate robust, suitable, and sufficient risk assessments to ensure these activities do not have a negative impact on their ability to effectively manage health and safety.

Evidence gathering and inspection activities

1.220 There were no workforce fatalities during the past year, but here were two RIDDOR reportable fatalities involving members of the public at stations on the London Underground network.

1.221 We made a number of enquiries into other incidents on the network including minor uncontrolled movements at depots and operational irregularities, and whilst not all resulted in injury, we continue to use each one as an opportunity to robustly check London Underground's approach to risk management, safety management performance and overall legal compliance.

1.222 Through these enquiries, we are in the preliminary stages of trying to identify trends in incidents; for example, potential links between the number of station infrastructure issues that have occurred and asset maintenance management,

inspection, follow up of fault reporting and repair. We will continue to look at this topic through our proactive interventions.

1.223 We commenced one formal investigation during the year which concerned the serious injury of a contractor on the Ballast Track replacement blockade at Embankment station. This will continue into the next twelve months through the collection of further evidence with decisions regarding potential enforcement outcomes to be made as the investigation progresses.

1.224 Our proactive work focused on London Underground's asset management arrangements and their capability to manage changes in risk profile as it responds to ageing assets and emerging financial challenges. We took a multi-layered approach involving our safety inspection teams who focused on how London Underground is using its data on a day-to-day basis to manage worker and passenger risk. This was complemented by our Rail Planning and Performance (RPP) Engineering Specialists who reviewed London Underground's high-level asset management strategy to gain assurance that the essential investment in renewals and capital investment appropriately considered asset condition, performance, whole life cost and safety risk. This work established that whilst London Underground were able to demonstrate prioritisation of asset interventions, these were vulnerable due to the quality of data available. On that basis, we plan to maintain a continued close focus on asset management matters over the course of the year.

1.225 We also delivered operational inspections on track competencies, inspection processes and reliability. These interventions revealed gaps in the provision of competence, and we raised concern over Track Recording Vehicle (TRV) reliability which has reached life expiry and requires regular repairs. This has negatively impacted operational availability, and in turn increased reliance on short-term mitigation. These findings have been shared with London Underground's track team and we continue to monitor their progress against the actions.

1.226 We continued to invest in and benefit from our close working relationship with London Fire Brigade (LFB) through regular liaison meetings and sharing of information. In particular, this year we collaborated with LFB and London Underground after concerns were raised regarding the safety of lithium-ion batteries used in e-scooters and e-bikes after two fire events. As a result of this work, London Underground prohibited this type of battery device on the network. Information and guidance from this work was shared across other modes and with our mainline railway colleagues.

1.227 London Underground, in line with TfL's modernisation programme, has been developing its own large programme of modernisation across the business to improve working practices and efficiency, and to also align it with the changes in

passenger behaviour and requirements whilst trying to incorporate new technology.

1.228 In addition to the technical, operational and health and safety related issues described, London Underground have experienced challenges with industrial relations and strike action during the year which has required them to respond at pace and implement additional controls.

1.229 Given this context, it will be essential for London Underground to ensure that it is not distracted from the day job of ensuring the safe operation of the capital's rail network.

Elizabeth line/Crossrail Project

Overview

1.230 The new Elizabeth line officially opened its doors to the public on Tuesday 24 May 2022, initially between Paddington and Abbey Wood, which marked the culmination of over ten years work for all involved in this landmark railway infrastructure project. This journey has not been without challenges, but the last year saw the project meet a number of major milestones.

1.231 Through our continued close collaborative liaison with the project team and other key duty holders, we have been able to continuously challenge and monitor the project's progress and ensure that duty holders met their respective health and safety duties.

Evidence gathering and inspection activities

1.232 Last year saw the project move away from testing, commissioning and trial running to trial operations through a staged approach to ensure that required work was completed on schedule ahead of opening of the line. These trial operations incorporated important operational exercises to test the safety and reliability of the railway, with over 150 scenarios trialled.

1.233 The project is now delivering its final (and arguably most complex) stages with issues around potential operation of rolling stock mode auto-reverse and the risk controls around managing the guideway. At the end of last year, challenges existed with regard to emergency communications in tunnel cross passages, but these were satisfactorily resolved to enable the necessary authorisations and consents to be provided.

1.234 The Elizabeth line successfully entered passenger service between Paddington and Abbey Wood on 24 May 2022. It is anticipated that the full end-to-end service will commence around May 2023.

Rail for London (Infrastructure) Ltd - RFLI

Overview

1.235 RfLI continue to work through the challenges from the Crossrail project in a professional and practical manner and have gained greater operational experience from their trial running and operations phases of the project. They continue to coordinate and work well with the other key stakeholders.

Evidence gathering and inspection activities

1.236 RfLI has had a busy first year as a new infrastructure manager during Elizabeth line trial running and trial operations stages.

1.237 Whilst project challenges have restricted their maintenance access to the network, RfLI have continued to keep up with necessary statutory work. There is however a backlog of non-statutory work and in order to manage this, they have taken on around 300 additional maintenance staff.

1.238 RfLI led a number of trials using volunteers across the central operating section during the year. This involved mass evacuations which were co-ordinated with other duty holders and the emergency services. These were well organised and executed with key learning points being collated, events re-run if required, and changes incorporated into procedures. These have also allowed control room staff to rehearse incidents involving members of the public which has resulted in quicker response times and improved operator confidence.

1.239 We continue to work closely with RfLI and provide challenge where work requires further review or development. Examples include:

(a) As referred to previously, the work on future planned 'auto-reverse' movements in order to achieve the Elizabeth line's 24 trains per hour timetable. RfLI worked well to produce the risk assessments and identify and implement control measures for managing the risk of a train operating without a driver in the leading unit. Whilst work on these measures continue, there has been an improvement in the understanding of the key risks in this type of operation and better cooperation and collaboration between the other key stakeholders.

(b) Track worker safety - RfLI's policy of no "red zone" working was tested after two incursions by Network Rail staff onto RfLI infrastructure in the last twelve months. RfLI and Network Rail undertook reviews of the incidents to identify lessons learned, and they continue to work together to gain assurance that planning and the briefings given to track workers on necessary safety precautions are effective.

(c) In the summer of 2021, an issue with voltage transformers resulted in several shattering. No injuries were sustained, and safe systems of work were identified and implemented by RfLI pending identification of the fault and replacement.

MTR – EL (Transport operator for Elizabeth line)

Overview

1.240 MTR appear to have effective processes in place to manage 'current state' operations and have stepped up to deal with a range of challenges in the past year associated with the introduction of the Central Operating Section (COS) through trial running, trail operations (phases 1 and 2) and entry into revenue service.

Evidence gathering and inspection activities

1.241 Over the past year, MTR has faced a number of operational challenges which are best characterised as:

- Adjusting its programme and assurance procedures to accommodate the changing timetable of the Crossrail Project.
- Coping with the pandemic restrictions which has affected staff attendance and their ability to prepare for operational readiness, which has also increased the skill fade issues already presented by the project timelines.
- A number of irregularities in rolling stock software configurations led to reviews of both the MTR's engineering change management process and Alstom's (the maintainer) procedures for development and installation of software upgrades. This included a joint review involving ORR's internal railway safety and engineering experts with specialist advice from the Office of Nuclear Regulation (ONR). Issues centred on the quality of recording of information and the data available for engineers to use and quality check software. All issues have been remedied or are in the process of being addressed between the relevant duty holders with an on-going review of the software specification by a specialist contractor. MTR have actively driven the improvements and have been robust in reviewing their own procedures to incorporate improvements.

Docklands Light Railway

Overview

1.242 Docklands Light Railway Limited (DLR) and its franchisee Keolis Amey Docklands (KAD) continue to deliver stable health and safety performance which is characterised by an absence of significant incidents involving staff or customers.

Evidence gathering and inspection activities

1.243 Our activities with the DLR in the last twelve months focused on the following activities:

- ROGS Safety Authorisation renewal.
- DLR's Investigation into cracked gearboxes.
- DLR's continued work on the challenge set by the Limehouse Coroner's regulation 28 'prevent of future deaths' direction.
- New trains and depot upgrade.
- Trespass and risk of injury from train surfing.

1.244 We continue to have a collaborative relationship with DLR and KAD and have observed their commitment to continuous improvement and health and safety best practice through the above activities. In particular:

- Their work in response to the Chief Coroner's Guidance on Regulation 28 on the prevention of future deaths, which set out matters of concern around the automatic operation of the DLR network and management of safety of persons who may slip, fall, or gain access to the track. A review of their current CCTV systems and procedures was undertaken which gave consideration as to how new technologies could be introduced or retrofitted, such as new camera systems and obstacle detection.
- Following discovery of a cracked gearbox, DLR responded quickly by assessing the fleet, investigating the issue, and increased non-invasive inspection processes. They have assessed the potential risks, put in relevant controls, and continue work collaboratively with the manufacturer.
- Train surfing continues to be a risk at many DLR stations. Work continues to assess and monitor 'hot spot' locations and consider longer term mitigations such as technology using artificial intelligence and camera software to identify persons accessing the train. In addition to this, they are reviewing whether the utilisation of current camera technology in increased locations could provide better monitoring ability across the network. As part of the train upgrades – this risk has been identified and addressed as part of new train design.

1.245 In the next year, we will continue the monitoring of DLR's change management process in relation to the new trains and depot upgrade as well as following up on the activities listed above.

London Overground – Arriva Rail London Limited (ARL)

Overview

1.246 ARL continued to deliver satisfactory health and safety performance which is characterised by an isolated number of incidents involving staff or customers.

Evidence gathering and inspection activities

1.247 This year, ARL's safety management system was reassessed and a renewal of their ROGs Safety Certification and Authorisation granted. The assessment was completed with no major concerns. There was limited proactive work completed with ARL, but we continue to engage collaboratively to monitor their health and safety performance.

1.248 We launched one formal investigation into the buffer stop collision that occurred at Enfield Town station on 12 October 2021 where an ARL train failed to stop at platform 2 and collided into the buffer, where the front coach of the train derailed and road up onto the buffers. We liaised with RAIB and British Transport Police (BTP) with regard to their investigations, whilst our enquiries focused on train driving technique, risk assessment and buffer stop performance. At the time of writing this report, no formal decisions have yet been reached with regard to enforcement action.

Track Transit Systems (TTS)

Overview

1.249 ORR has regulatory oversight of the three airport Track Transit Systems (Airport people movers) in Great Britain that are all Grade of Automation level 4 (GoA4), where trains operate automatically at all times. On that basis, on-board staff are not required for the safe operation of the train.

1.250 In the last two years, the TTS systems at Gatwick, Heathrow and Stansted have had extremely limited operation due to the impact of the COVID-19 pandemic and associated grounding of flights. Essentially, these systems have spent much of that time undertaking only essential maintenance runs.

Evidence gathering and inspection activities

1.251 Since the COVID-19 restrictions were lifted and business returning to airports, these systems have seen renewed usage.

1.252 We have undertaken limited proactive liaison and monitoring of these systems due to the limited risk from the services not operating, but our interventions have focused on the following areas:

- Heathrow TTS - Rolling stock upgrade and depot modifications.
- Gatwick TTS - the renewal of the safety certificate and authorisation, in addition to a follow-up depot inspection.
- Stansted TTS - currently undergoing SMS reassessment as part of an application for a renewed safety certificate and authorisation.

1.253 Over the next twelve months, we will look to continue to engage with TTS operators and support the TTS forum in sharing best practice and experience.

Tram and light rail

Overview

1.254 The second year of the pandemic continued to provide significant challenges to the tram sector, along with the whole of the rail industry. Further pandemic restrictions throughout the year meant that overall, the UK's Tramways saw a sustained decline in passenger numbers compared to pre-pandemic levels. However, following the gradual removal of COVID-19 restrictions as we moved in 2022, passengers quickly returned to trams as a convenient mode of public transport, which encouragingly in some areas was near to pre-COVID-19 levels.

1.255 Our investigation into the fatal Sandilands tram derailment in November 2016 concluded at the end of March 2022 with a decision to prosecute Transport for London, Tram Operations Limited and the tram driver for breaches of health and safety law.

1.256 We continued to press the tram sector, through meetings with senior leaders of several tramways, to fully implement the outstanding recommendations from RAIB's report into the Sandilands accident. We have particularly focused on ensuring progress implementing recommendations 3 (prevention of over-speed) and 4 (driver attentiveness) is maintained, requiring clearly defined and funded plans in place by the summer of 2022.

1.257 We conducted a number of focused inspection projects during the year. We gave advice and, where appropriate, ensured action was taken to address any safety management system concerns.

Evidence gathering and inspection activities

1.258 Light rail systems continued to provide a crucial means of transport for members of the public including key workers during the pandemic. Light rail is increasingly seen as a green and efficient transport solution in heavily populated city/town environments and we continue to monitor new scheme proposals such as the Coventry very light rail project.

1.259 Once again, the tram sector reported no workforce fatalities in connection with their operations during the year. There have also been no passenger fatalities since 2016. There were 29 incidents which resulted in passengers or members of the public being taken directly to hospital and three fatalities resulting from collision between members of the public and trams.

1.260 We made several preliminary enquiries into incidents on various tram networks. These have included collisions with pedestrians, cyclists and other road vehicles, signals passed at stop, platform train interface incidents, pedestrian crossing incidents and minor tram derailments. Where appropriate, we have taken action to close out any issues identified and promote continuous improvement.

1.261 Tyne and Wear Passenger Transport Executive (trading as Nexus) were convicted of an offence under Section 2(1) Health and Safety at Work etc. Act 1974 and fined £1.5m on 23 April 2021. The case involved the death of an employee killed whilst working at height and carrying out maintenance work on high voltage overhead cables. Our investigation found safety critical procedures were ignored and continued to be for a substantial period after the death. Failures included allowing work to be carried out without the appropriate instructions for staff to prevent injury; work being undertaken without the required safety critical permits; lack of monitoring and supervision of safety critical work and inadequacies in policy documents covering 'live line working', which failed to include a requirement for staff to test all electrical wires before carrying out work.

1.262 We continue to build an RM3 profile for the sector across a range of criteria, and our assessment indicates that tramways are generally operating in the managed to standardised ranges. There is evidence that management maturity is at a predictable level in several areas. These include Leadership, and Risk Assessment and Management. It does remain the case that in some areas, ad-hoc safety management maturity was noted. Accordingly, the relevant duty holders have been required to take action and we will continue to monitor outcomes closely.

1.263 The Light Rail Safety and Standards Board (LRSSB) Tram Incident and Accident Reporting system (TAIR) and the LRSSB Risk Model continue to mature, although tramways now need to be provided with more up to date outputs from the risk model, as it was last run on behalf of tramways in 2020. LRSSB is working to

improve TAIR's usability with each tramway's requirements in mind. LRSSB has also developed additional tools for tramways to increase their risk profiling accuracy. As an example, generic bow tie risk assessments for the sector's top ten risks have been produced by LRSSB and provided to all seven tramways to aid management of low frequency high consequence events. ORR continue to work with the LRSSB to see if RIDDOR data can be extracted at source.

1.264 We continued to strengthen and benefit from our formal liaison arrangements with the LRSSB and UK Tram throughout the year and provided support to their work plan and initiatives. These include development of TAIR, research to analyse pedestrian and public behaviour around tramways, and publication of several important industry guidance documents relating directly to the Sandilands RAIB recommendations. These include speed management systems guidance and driver inattention systems guidance. LRSSB continues to provide the sector with other valuable guidance materials to aid safety management and decisions around the reasonable practicability of control measures.

1.265 We met with several tramways during the year to continue to drive progress on the implementation of outstanding RAIB Sandilands recommendations, in particular, the recommendations on prevention of overspeed and driver attentiveness. We have secured commitments from all tramways on the procurement and implementation of speed control and driver attentiveness systems to implement these recommendations. We will continue to engage to ensure action plans are and timescales are met. In the meantime, we continue to challenge the industry on their current reasonably practicable controls to improve the reliability of line-of-sight driving.

1.266 Although COVID-19 impacted on the way we were able to carry out our regulatory supervision of the sector, we continued to deliver a robust proactive inspection programme. We identified key areas for our assurance work through reference to our Strategic Risk Chapter and risk prioritisation exercise along with the output of the LRSSB risk model. Our programme included themed inspections covering the implementation of the LRSSB risk model within individual tramways, risk assessment of non-motorised user (NMU) crossings, violence and aggression to tram staff and tram driver dispatch. These interventions targeted legal compliance and the effectiveness of each duty holder's safety management arrangements. The NMU crossing inspection project highlighted certain tramways had weaknesses in their risk assessments and consequently lacked clear plans to implement more effective control measures. We are engaged in securing these improvements.

1.267 We have seen a change in public expectation concerning safety in on street and shared sections of tramways. Following a number of incidents in city centre areas over the last few years the LRSSB, with our support, has initiated research to analyse pedestrian behaviour in and around tramways to better understand how

pedestrians interact with a tramway. This has the potential to identify areas where new or additional risk control measures might be considered reasonably practicable. We will monitor the outcome of this work.

1.268 In March 2022, following the conclusion of our investigation of the fatal accident at Sandilands, we commenced legal proceedings against the operator and infrastructure manager of the Croydon tramway as well as the driver involved. This matter will now be subject to Court processes through to conclusion.

Channel Tunnel

1.269 Throughout the year, we continued to provide leadership, expert advice, and secretariat support to the Inter-Governmental Commission (IGC) and supported the activities of the Channel Tunnel Safety Authority (CTSA).

1.270 Our inspectors are appointed, alongside their French counterparts, to lead and deliver the CTSA and National Safety Authority inspection plans, which aim to assure that Eurotunnel's and train operators' safety management systems are

capable of managing the specific risks associated with Channel Tunnel operations. We also manage, monitor and close out outstanding recommendations from the CTSA and NSA bi-national inspections and investigations.

1.271 As with other UK and European railway operations, COVID-19 had a significant impact on Channel Tunnel passenger numbers. The gradual relaxation of international COVID-19 travel restrictions helped passenger demand gradually increase through the year, although this remains well below pre-pandemic levels. The pandemic also negatively impacted international freight operations, despite Eurotunnel carrying 1.43 million trucks in 2021.

1.272 The CTSA's work last year focused extensively on monitoring Eurotunnel's approach to safety-related issues in respect of its new Elec Link HVDC interconnector project and provided a level of assurance to the IGC which enabled consent for commercial operation to be granted. This 'world first' project will enter commercial operation in mid-2022 and will enable a 1GW power exchange capability between the UK and France.

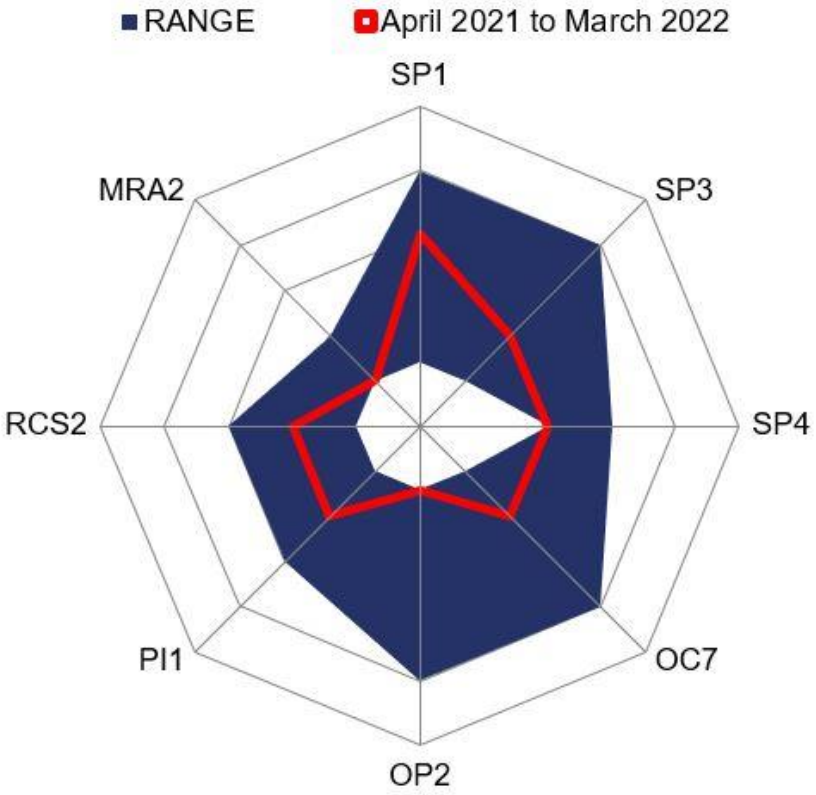
1.273 The CTSA has also delivered statutory assessment activities to amend Eurotunnel's safety authorisation and renew safety certificates for Eurostar and DB Cargo Limited. CTSA continued to work closely with Eurotunnel on its plans to modernise its passenger shuttle fleet. It also reviewed plans for the carriage of lithium-ion batteries and transportation of liquified natural gas (LNG) powered trucks through the Tunnel to ensure that risks are identified, assessed, and appropriately mitigated.

1.274 The CTSA has also held Eurotunnel to account over its safety leadership, change management and emergency planning arrangements to identify shortcomings and drive improvements in these areas. Eurotunnel has subsequently instructed a detailed review and assessment of both its safety leadership and crisis management capability through external consultants. The CTSA welcomes this work and is committed to supporting Eurotunnel make the necessary improvements through a focussed, long-term strategic approach.

1.275 We have played a key role, working in conjunction with French and UK transport ministry colleagues, in developing a number of bilateral agreements to facilitate the uninterrupted flow of post-Brexit traffic through the Channel Tunnel. Work has also been ongoing to clarify the impact of the new Binational Regulation on our policy and processes for managing Channel Tunnel safety certificates and authorisations, and to produce joint agreed guidance between the UK and French national safety authorities setting out cooperation arrangements under the new regulatory regime. We have also engaged regularly with operators through a series of stakeholder events to ensure interested parties are kept abreast of developments and have a clear understanding around expectations and requirements.

Heritage railways

Figure 1.8 A composite RM3 – Heritage assessment of heritage railways' management maturity in 2021 - 2022



Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
SP1	Leadership	3	1	4
SP3	Board governance	2	1	4
SP4	Written safety management system	2	2	3
OC7	Record keeping	2	1	4
OP2	Competence management system	1	1	4
PI1	Risk assessment and management	2	1	3
RCS2	Asset management (including safe design of plant)	2	1	3

Code	Description	April 2021 to March 2022 score	Minimum score	Maximum score
MRA2	Audit	1	1	2

Overview

1.276 We use the Risk Management Maturity Model (RM3) to assess duty holders' ability to achieve excellence when controlling health and safety risks. We recognise that many minor and heritage railways may find some elements of RM3 inaccessible or not obviously relevant to them. We have developed a specific topic set that provides focused descriptors over a much smaller and readily accessible set of criteria that reflect the heritage sectors' operating characteristics and risk profile.

1.277 We believe that this approach makes RM3 more accessible and meaningful as a tool to help the heritage sector identify what they can do to improve the maturity of their safety management systems. We have used this specific topic set for our assessment of the heritage sector's risk management capability.

1.278 Our assessment of the sector's health and safety management capability during last year showed that the sector as a whole was continuing to perform at a largely

ad-hoc and managed level. We have seen the following changes in the sector's mean performance:

(a) SP1 'Leadership': Increased from managed to standardised.

(b) PI1 'Risk Assessment': Increased from ad-hoc to managed.

(c) OP2 'Competence Management': decreased from managed to ad-hoc.

1.279 Of particular note, the decrease in mean performance for competence management across the sector is concerning as we continue to see weaknesses on how duty holders manage the competence of staff undertaking safety-critical tasks.

1.280 Our planned work for 2022 - 23 has been defined by the following risk areas:

(a) Safety Management Systems.

(b) Infrastructure Asset Management.

(c) Rolling Stock Asset Management.

1.281 The evidence used to inform our assessment has come from all our interventions with the heritage sector, including investigations, permissioning work and inspections.

Evidence gathering and inspection activities

1.282 As the heritage sector continues to recover from the impacts of the pandemic and railways recommence operations, our proactive inspection work focused on heritage railways' core risk controls of safety management systems, staff competence and asset management.

1.283 We investigated several serious incidents and issued one Improvement notice and one Prohibition notice to secure compliance with the law and address serious risks.

1.284 We have continued to engage across the heritage sector in order to maintain and increase its management of risk. During the past year we have:

(a) Attended and presented at a variety of Heritage Railway Association (HRA) and local railway events and meetings.

(b) Continued engagement with HRA's Operating and Safety Committee.

(c) Continued to support HRA's work to establish a Heritage Railways Safety and Standards Board.

1.285 We remain of the view that the heritage sector needs greater leadership in developing guidance and standards, and the enabling of cross operator cooperation and information exchange. We are therefore supportive of the HRA work to establish a dedicated body to draft and publish guidance and standards for the heritage sector. We believe that this can add significant value to the sector and improve standards of safety performance.

1.286 Whilst it is reassuring that our inspections are continuing to find that individual railways are making progress to address gaps in their safety management systems, it is often the case that we identify significant shortcomings through its inspection and investigation work. Meaningful monitoring and audit arrangements can play a significant role in increasing the capability of safety management systems before any deficiencies can manifest themselves as serious incidents.

1.287 We expect heritage railways to adopt a proportionate approach to the management of risk. The implementation of appropriate arrangements to ensure the health and safety of their employees, volunteers and passenger, is essential to the provision of an historic experience with 21st century levels of safety.


WHISTON
NATIONAL COAL BOARD


WHISTON
NATIONAL COAL BOARD

Operational Incidents

Overview

1.288 During the past year, we investigated a number of serious operational incidents, taking formal enforcement action to address serious risks and ensure that duty holders took appropriate action to comply with the law. A common theme in many incidents was the failure by duty holders to adequately manage the competence of operational staff.

Evidence gathering and inspection activities

1.289 We investigated a number of operational incidents over the course of the year. These included a number of uncontrolled runaways, a signalling irregularity where two trains were able to enter the same section, as well as a number of signals passed at danger.

1.290 In September 2021, five passengers sustained minor injuries after a locomotive collided with a stationary passenger train at Grosmont station. Our investigation found that the railway was unable to demonstrate the competence of its footplate staff and we issued an Improvement notice requiring the duty holder's competence management system be reviewed and updated, with appropriate arrangements put in place for monitoring the competence and fitness of footplate staff.

1.291 In January 2022, an engineering train collided with the closed gates of a level crossing at Wirksworth, Derbyshire. Although there were no injuries as a result of the incident, under slightly different circumstances crossing users could have been struck by the train or crossing gates. Our investigation revealed that the railway had no arrangements in place to demonstrate the competence of staff operating loose coupled, non-continuously braked trains. Our inspectors issued a Prohibition notice requiring the railway to immediately cease operation of all loose coupled trains.

1.292 Competence plays a very important role in controlling health and safety risks. It is disappointing to find examples of no documented competence management systems or systems being out of date. Heritage railways therefore need to ensure that they have appropriate systems in place to manage the competence of their staff and volunteers.

Asset Management

Overview

1.293 Heritage railways continue to face challenges in ensuring that rolling stock, track, civil engineering and off-track assets are safe. It is important that duty holders' safety management systems contain appropriate arrangements for the inspection of assets at routine intervals.

Evidence gathering and inspection activities

1.294 We continue to see incidents where asset condition is an underlying factor. These have included two derailments on narrow gauge railways caused by excessive track twist, three incidents of trains colliding with objects on the line including fallen trees and two examples of mechanical failure of steam locomotives during the last year.

1.295 Traction and rolling stock maintenance processes throughout the sector are often derived from historic mainline standards but are then not suitably adapted to take into account the specific nature of heritage operations. We continue to find inconsistencies in the standard record keeping associated with rolling stock maintenance activities.

1.296 In previous years we have highlighted the importance of duty holders having suitable arrangements in place for the inspection and management of civil engineering assets. The historic nature of many assets on heritage railways means that it is essential that appropriate inspection and maintenance regimes are implemented to ensure that structures and earthworks remain in a safe condition. Given this context and as an area identified as presenting higher risk, we will in carry out a series of inspections to examine how heritage railways are managing their civil engineering assets so as to ensure that they remain in a safe condition.

2. Our safety policy and strategy work

2.1 We have continued to develop, improve and promote the regulatory framework for railway safety. In particular:

2.2 In June 2021, we published Principles for Managing Level Crossing Safety which will support improvements in level crossing safety by encouraging better collaboration between those involved in managing level crossings and highways and a greater emphasis on understanding the behaviours and actions of level crossing users. This guidance document was produced as a result of significant input and support from an external stakeholder steering group, chaired by ORR. Alongside this, we updated our web content on level crossings and published two animated case studies to support the new guidance.

2.3 In August 2021, we published the Is safety really part of the rail industry's DNA? report by Pam Warren which reviewed the progress made and lessons learned since the Ladbroke Grove Rail incident in 1999. Pam is a survivor of Ladbroke Grove and a long-time campaigner for lessons to be learned from the incident. We also published an ORR overview of the Pam Warren report at the same time.

2.4 We completed the second post implementation review (PIR) of the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended), which was published by the Department for Transport in September 2021. The PIR confirmed that ROGs are continuing to work well but that interfaces between ROGs and other legislation and standards are not always clearly understood, and that guidance on these interfaces would be helpful for stakeholders. This work is being taken forward in co-ordination with work arising from the more recent The Railways (Interoperability) Regulations 2011 (RIR) PIR which also identified a need for guidance on the interfaces between ROGS, RIR and other standards. We also published a separate ROGS PIR findings and conclusions report which gave a detailed summary of the stakeholder input to the ROGs PIR.

2.5 In October 2021, we published an updated version of our Guide to ROGs to explain the changes made to ROGs following our exit from the EU. At the same time, we published a consolidated version of the ROGs legislation showing the various changes made by EU exit legislation. This was in response to requests from stakeholders who responded to the ROGs PIR.

2.6 We published a new series of frequently asked questions and answers on the Train Driving Licences and Certificates Regulations 2010 (TDLCR) to provide easier access to information on the requirements of the regulations and our policies on handling licence applications. We continued to work collaboratively with train operators to enable the processing of applications for new mainline train drivers to be licensed under TDLCR, processing more than double the number of the previous year and ensuring that the national register of licensed train drivers remains up to date. As some of the licensing requirements in TDLCR have been in place since 2011, we published new guidance on our policy and process for renewing train driving licences when they expire after 10 years. We also worked with the developer towards the introduction of an improved electronic system for managing licence applications and holding licence details which will provide benefits and efficiencies for ourselves and train operators when it is implemented later in 2022.

2.7 In the run up to the ending of mutual recognition of EU and UK train driving licences on 31 January 2022 we issued new guidance for cross-border operators on licence requirements for drivers operating service through the Channel Tunnel and processed new licence applications for affected drivers. We were also

involved in negotiating a number of bilateral agreements between the UK and France to enable continued smooth operations through the Channel Tunnel.

2.8 We carried out a review of the Light Rail Safety and Standards Board and published our findings in March 2022. LRSSB was established in 2019 following the overturning of a tram at Sandilands in Croydon. As part of this, we consulted stakeholders for their views on the effectiveness of LRSSB in its first few years of operation. Our findings show that LRSSB has been effective in adding value to the light rail sector and assisting in the delivery of recommendations for safety improvements made by RAIB. Our review made six recommendations which are intended to ensure that the light rail sector maintains a structured and formal approach to the continuous improvement of safety standards.

2.9 Throughout the year we kept our guidance for railway operators on managing compliance with health and safety legislation during the pandemic under review and made amendments as restrictions eased.

2.10 We continued to keep our own internal Quality Management System processes under review. In particular, as part of an ongoing programme of continuous improvement to improve the quality of data that supports our work, we commenced a project to review and improve further our risk prioritisation and Strategic Risk Chapter processes. This work will ensure our annual risk profiling workshops, which help us set operational priorities for the following work year across all sectors of the industry, provide the best quality data and intelligence we can to assist decision making. It will also ensure the Strategic Risk Chapters remain current and relevant and continue to provide a strategic focus on key priority topics for both the industry and ourselves.

2.11 Our Risk Management Maturity Model (RM3) was developed as a tool to help organisations better understand their safety management maturity and identify areas for improvement. The RM3 Governance Board, comprising ORR and rail industry sector representatives, makes an important contribution in securing stakeholder collaboration in the continuous improvement of RM3. This includes facilitating the co-operation between the regulator, industry and employees, in the development, promotion and wider use of RM3 to improve standards of operational safety and occupational health and safety performance. To help to define our plans for the RM3 Model, we have published an RM3 strategy which describes our aims and objectives for RM3 in the medium and longer term.

2.12 In September 2021 we commenced work with an external specialist to develop an RM3 e-learning solution which will be accessible via our website. The e-learning material, which comprises two modules, has been developed in collaboration with industry and representatives from the RM3 Governance Board. Module 1 is an introduction to RM3 and demonstrates the wide reach of the model by illustrating how both the rail industry and non-rail sectors have embraced its use within their

organisations. Module 2 looks at the theory and application of the model, and is broken down into 3 bite size sections: What is RM3?: Using RM3; and RM3 in Practice. The e-learning package will be launched by the end of July 2022.

2.13 We have changed the process by which we train new HM Inspectors of Railways. Previously training was delivered by an external contractor. However, from April 2022, we have achieved accreditation from the Scottish Qualifications Authority (SQA) as a learning partner of NEBOSH, which allows us to deliver internally its own training programme for new Inspector recruits, culminating in the award of a Diploma in Regulatory Railway Occupational Health and Safety after successful completion of the programme.

2.14 We chaired three meetings of the Railway Industry Health and Safety Committee, which brings together representatives of employers, employees, passengers, and government bodies to discuss and contribute to health and safety matters, and we worked with other health and safety regulators to share best practice.

2.15 We continued to work with other railway safety authorities across Europe via the International Liaison Group of Government Railway Inspectorates (ILGGRI), to which we provide the Secretariat. ILGGRI continues to remain a valuable forum to exchange knowledge and good practice on key railway safety topics and for us to gain insight into legislative and standards developments in the EU.

3. Permissioning

Safety certificates and authorisations

3.1 Safety certificates are issued to duty holders where the transport system operates at speeds above 25mph or 40kph. A Mainline safety certificate comes in two parts. Part A sets out the general safety management arrangements. Part B relates to one transport system and it includes details of how the specific transport system requiring a safety certificate is operated safely. Non-mainline certificates come in one part. The requirements are broadly similar to a mainline application.

3.2 Mainline and non-mainline safety authorisations are specific to the relevant infrastructure. The main difference in applying for a mainline or non-mainline authorisation is the size and nature of the infrastructure being managed.

3.3 The number of safety certificates and safety authorisations issued during the past year are shown below:

Table 1.1 Mainline

Type	New	Amended/ Updated	Renewed	Total
Safety Certificates Part A	3	1	11	15
Safety Certificate Part B	3	12	11	26
Safety Authorisation	2	2	4	8
Total	**8**	**15**	**26**	**49**

Note: A large number of Part B safety certificates required amending/updating to reflect a change in the legal denomination of an infrastructure manager.

Table 1.2 Non-Mainline

Type	New	Amended/ Updated	Renewed	Total
Safety Certificate	1	0	3	4

Type	New	Amended/ Updated	Renewed	Total
Safety Authorisation	1	0	4	5
Total	**2**	**0**	**7**	**9**

ROGs regulations 30(1) exemptions

3.4 Six applications were processed to exempt non-mainline duty holders from the requirement to hold a safety certificate and safety authorisation whilst operations were being carried out above 25mph on their infrastructure. Five of these applications were to enable testing of new infrastructure maintenance vehicles whilst the other application was to enable the filming of scenes for a movie using replica locomotives.

Train driving licensing

3.5 In the year ending 31 March 2022 we:

- Issued 1,434 new train driving licences of which 294 were to support the post EU exit licence requirements for cross border drivers operating services through the Channel Tunnel.
- Processed 170 train driving licence renewals.
- Recognised a further two doctors, 16 psychologists and one training and examination centre and added them to our registers as required under the Train Driving Licences and Certificates Regulations.
- Attended a hearing following a driver's appeal against ORR's decision to withdraw a train driving licence.

Level crossings

3.6 Our level crossing work entails some permissioning activity. In the year ending 31 March 2022 we delivered 21 Level Crossing Orders, five Variation Orders, one Revocation Order, four Directions and three Authorisations for Traffic Signs.

4. Rail Accident Investigation Branch

4.1 The Rail Accident Investigation Branch (RAIB) is the independent investigation body for accidents and incidents on UK mainline, metro, tram and heritage railways. The purpose of RAIB is to investigate accidents (independently of ORR, BTP and other bodies), with the aim of improving railway safety. RAIB is not a prosecuting body and does not apportion blame or liability in its reports. Independent investigation of railway accidents is an invaluable opportunity for whole industry learning.

4.2 Where it identifies an opportunity to improve railway safety, RAIB will make a recommendation. Where a recommendation is made on a railway industry body, our role is to pass it on to those organisations we think are best placed to act upon it. We then report those actions taken back to RAIB. RAIB can also make recommendations on bodies outside the railway industry, although in those circumstances we are not involved in passing on the recommendation or reporting actions taken to RAIB.

4.3 Since RAIB was established in 2006 it has issued approximately 1,700 recommendations.

4.4 We have a good working relationship with RAIB, helping us share our understanding of incidents, the key learning from them and areas where we share concerns. Meetings are held between the RAIB and ORR Chief Inspectors, the ORR Chief Executive and RAIB Chief Inspector as well as regular working level meetings. RAIB also attends RIHSAC meetings.

4.5 In January 2022 RAIB appointed a new Chief Inspector and we look forward to continuing our constructive working relationship.

Reporting to RAIB

4.6 We have a statutory obligation to report to RAIB on the action being taken to address a recommendation from a report within twelve months of publication. We also provide updates to RAIB when we consider that work done by a duty holder has resulted in the implementation of a recommendation.

4.7 In the past twelve months, we received nine reports, which included a total of 52 new recommendations. 29 of these recommendations were contained in two significant RAIB reports - Derailment of a passenger train at Carmont, Aberdeenshire, 12 August 2020 (containing 20 recommendations) and Derailment and fire involving a tanker train at Llangennech, Carmarthenshire 26 August 2020 (nine recommendations).

4.8 We reported to RAIB on 119 recommendations; 78 were reported as implemented; 22 as implementation ongoing; 18 as progressing. No recommendations were reported as having had an insufficient response and one was directed at another public body outside of our jurisdiction.

4.9 Two recommendations on ORR were reported as implemented in the past year. Both recommendations were concerned with our guidance on level crossings, covering signage and decision points at UWCs. We published new level crossing guidance in June 2021, that is not prescriptive in nature, but promotes duty holder understanding of the characteristics of each individual level crossing and the risks that need managing. The duty holder can then decide what measures are needed at that level crossing, balancing out competing needs. The publication of this guidance met the intent of the two RAIB recommendations.

4.10 There is one recommendation on ORR that we have not yet been able to report as implemented. The recommendation was from the 'person struck by a train at Eden Park station, 26 February 2020' report published on 19 February 2021 and is concerned with amending our Accessible Travel Policy guidance for station operators, to include information on whether station platforms they manage are fitted with tactile surfaces.

4.11 Any material changes to our guidance will require a public consultation and re-approval of all train and station operators' Accessible Travel Policies (ATP). It remains clear that train and station operators would not be able to comply with an immediate obligation to publish accurate and reliable information on whether the station platforms they manage are fitted with tactile surfaces due to the current known deficiencies in the data, noting that work remains ongoing to remedy this.

4.12 Our Consumer Team will continue to monitor industry progress in this area. When we have greater certainty regarding operators' access to accurate data on tactile surfaces across all of their stations, along with arrangements for that data being maintained, we can consult on incorporating this as a requirement within our ATP Guidance. Once this has been done, we will be able to commence compliance monitoring via station inspections and website checks.

4.13 The report Derailment of a passenger train at Carmont, Aberdeenshire, 12 August 2020 includes a recommendation for DfT and ORR to jointly review the current arrangements for the oversight of Entities in Charge of Maintenance (ECMs) and certification bodies that are not based in the UK. As this report was only published in March 2022 we will respond to RAIB on our actions to implement it within 12 months of publication.

Safety Digests

4.14 As well as full investigation reports, RAIB also publishes Safety Digests. Safety Digests are a useful alternative to full RAIB reports as they are produced more quickly after an incident and are focused on identifying safety learning rather than making recommendations. In the year ending 31 March 2022, RAIB issued six safety digests.

RAIB summary of learning documents

4.15 Alongside their 2021 Annual Report, RAIB published updated versions of its six Summary of learning documents covering the key learning in areas where RAIB has done the greatest number of investigations. RAIB sets out the purpose of these documents as being to provide a repository of some of the most important areas of learning identified in its investigations to date. The documents are cross-referenced to relevant RAIB reports and note where the issues raised have already been the subject of actions by duty holders when responding to RAIB recommendations, or are in the process of being addressed.

4.16 No new summary of learning documents were published this year.

5. Our enforcement activities

5.1 We secure improvements in health and safety for passengers, the workforce and public through evidence-based advice and encouragement to duty holders to improve and adapt their risk management.

5.2 On some occasions, we have to use our formal powers to ensure compliance with the law or to deal with immediate risk. Mostly, we use enforcement notices to stop an activity involving serious risk, or to rectify serious gaps in duty holders' risk control. Our enforcement policy statement sets out how we ensure rigour and consistency in our enforcement decisions by using our enforcement management model.

Improvement notices between 1 April 2021 and 31 March 2022

5.3 We served nine Improvement notices compared with eleven in the previous year.

5.4 The reasons for these notices included:

(a) Failure to have adequate systems in place to ensure that rail ballast brush machines are maintained in good repair and inspected at suitable intervals.

(b) Failure to take suitable precautions regarding demarcation of isolation sites to prevent injury to persons engaged in work activity near live conductors.

(c) Failure to take suitable precautions regarding system for 'proving dead' before work commences to prevent injury to persons engaged in work activity on, or near live conductors.

(d) Failure to prevent unauthorised access to the main line railway through installation of permanent fencing to a suitable standard.

(e) Failure to ensure, on trains which have toilet and handwashing facilities, that there is an effective written scheme of controls to prevent exposure to Legionella.

(f) Failure to demonstrate that all footplate personnel are competent in their duties for operation on the railway infrastructure.

(g) Failure to produce a written scheme of control for the control of legionella.

(h) Failure to undertake a suitable and sufficient assessment of the risks from legionella bacteria.

(i) Failure to plan, manage, and monitor the construction phase and co-ordinate work to ensure that construction work undertaken by rail power and construction (RPC) workers is carried out without risks to health and safety of themselves or others (including members of public).

Prohibition notices between 1 April 2021 and 31 March 2022

5.5 We served one Prohibition notice compared with two in the previous year:

(a) Failure to demonstrate competence of staff and volunteers to operate non-continuously braked trains

Prosecutions between 1 April 2021 and 31 March 2022

5.6 Summary overview of our concluded health and safety prosecutions :

Table 5.1 Prosecutions concluded

Defendant(s)	Incident	Fine
Tyne and Wear Metro operator, Nexus	In July 2014 an employee was killed at the company's South Gosforth depot whilst he was working at height carrying out maintenance work on high voltage overhead cables. Nexus pleaded guilty to an offence under the Health and Safety at Work etc. Act 1974 (HSWA) for failing to ensure the safety of staff.	£1.5 million
QTS Group	In October 2017 a contract rope access technician broke his arm when it became entangled in a drilling rig they had provided. The technician was assisting the drilling rig operator with the installation of soil nails to a railway cutting slope. QTS Group pleaded guilty to offences under HSWA and the Provision and	£12,000

Defendant(s)	Incident	Fine
	Use of Work Equipment Regulations 1998.	
WH Malcolm Limited	In 2017 an 11-year-old boy was killed after gaining access to the Daventry International Rail Freight Terminal near Rugby with his friends to retrieve a football. He was able to climb on top of a stationary freight wagon, where he received a fatal electric shock from the overhead line. WH Malcolm Limited was charged with, and found guilty of, two health and safety offences under HSWA and the Management of Health and Safety at Work Regulations 1999.	£6.5m and ordered to pay costs
Amey Rail Limited	In October 2018 a road-rail excavator vehicle overturned during an unsafe lift outside Market Harborough station on the Midland Main Line. Amey Rail Limited pleaded guilty to an offence under HSWA for failing to ensure lifting operations involving lifting equipment were properly planned, supervised, and carried out in a safe manner.	£600,000 plus full costs

The photograph on the front cover of this document was supplied by Transport for London.

The photograph before paragraph 1.276 in this document was supplied by Frank Richards.

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