Annual report of health and safety on Britain's railways 2023 to 2024

Chief Inspector's review

by Richard Hines

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Great Britain's railways continue be amongst the safest in the world. That statement is something that we should all rightly feel proud of. It's an outcome that is the product of years of investment, strong leadership, a relentless focus on fixing important problems, increasing collaboration, and a collective commitment to ensure that lessons are learned and mistakes from the past are never repeated.

Our railways however face many significant challenges. The real impact that climate related changes are having on our infrastructure and operations are visible – this is not a problem for the future, but one we are facing now.

The industry also potentially faces a long period of significant change through further reform. In addition, it is operating in an environment where there is a greater reliance on maintaining existing assets rather than replacement. Put simply; this is not a time to be complacent.

The following sections of this report describe our assessment of the railway industry's health and safety performance for the year. Based on feedback from last year's report, we have again included a selection of case studies to illustrate how we have promoted, collaborated, and secured improved outcomes through our various interventions.

My key reflections from the last work year are briefly summarised below.

Network Rail

2023 to 2024 was an important year for Network Rail as it signalled the end of Control Period 6 (CP6), and the start of Control Period 7 (CP7). A detailed account of Network Rail's performance against commitments over this four-year period is provided in our Network Rail Annual Assessment. But I do want to recognise the significant progress that has been made in a number of areas through CP6 which include trackworker safety, drainage asset inventories and occupational health improvements in areas such as Hand-Arm Vibration (HAVS). However, not all commitments were met in full and there is more to do to ensure that necessary improvements are implemented in a timely manner.

Network Rail maintained good health and safety performance during the year. It however continues to face challenges with managing asset safety in the face of weather-related risks, especially from extreme weather. Although still being implemented, Network Rail's Modernising Maintenance reforms have the potential to deliver efficiencies but need to be done in a way that does not overload people with too much change too quickly, nor result in fatigue. An increased focus on occupational health risks is also required.

Mainline operators

We have seen improvements during the work year in the investigation of Signals Passed at Danger (SPADs) by dutyholders. However, the number of SPADs that were attributed to drivers increased during the year. Further work across the industry is required to understand what underpins this growing trend, and subsequently, what more can be done in the intervening period before the European Train Control System (ETCS), with speed supervision, is implemented more widely.

I have been very concerned to see recent instances where some Train Operating Companies (TOCs) have not implemented effective change management processes when modifying existing and introducing new train fleets. This, and an underlying apparent weakness in risk assessment capability, must be addressed.

Non-mainline railways

We continued to push for improved health and safety outcomes across our non-mainline railways portfolio which covers Trams, Transport for London, the heritage sector, the Channel Tunnel and Safety by Design.

Of particular note, we continued with our work to ensure that the Rail Accident Investigation Branch (RAIB) recommendations following the tragic Sandilands incident are fully implemented across the tram sector. We continue to support the good work of the Light Rail Safety and Standards Board (LRSSB) in driving improvements across the tram sector and entered into a new Memorandum of Understanding (MoU) with them to strengthen and formalise our relationship.

We also published new guidance to assist heritage rail operators with developing effective, but proportionate health and safety management systems. This formed the basis of six, in-person workshops we delivered across GB to 82 railways and tramways with the valuable support of the Heritage Railway Association (HRA).

Policy, strategy, and statutory permissioning activities

During the year, we continued to develop and improve our arrangements and supporting processes for regulating railway health and safety. We also delivered a range of statutory work through health and safety permissions and approvals.

In particular, we progressed recommendations from the post implementation review report of the Train Driving Licences and Certificates Regulations 2010 (TDLCR). We worked closely with the Department for Transport (DfT) to explore options for improving the efficiency of the licensing regime.

We continue to benefit from strong international relationships and collaboration. We were delighted to rejoin the National Safety Authority (NSA) Network as an observer following an invitation from the European Union Agency for Railways (ERA).

We maintain our approach of working closely with industry on regulatory issues. However, we will take enforcement action where necessary. We served nine enforcement notices during the year and concluded four criminal prosecutions which resulted in fines exceeding £14.5M.

Themes for the year ahead

The publication of our Annual Health and Safety Report provides an opportunity to set out what I consider to be the main themes and areas of challenge for the year ahead. I have three:

1. Delivering effective change, safely

At the time of writing this report the election was imminent and in due course we will find out if a

future government intends to pursue rail reform. Further details will likely emerge over the coming weeks and months. As part of the Civil Service, we stand ready to work with all parties to support and assist the implementation of Government policy.

Reform may require enormous change. Change presents many opportunities, but also significant threats to effective health and safety management. There are many instances where ineffective change management processes, at every level, across every part of our industry, have been highlighted as a causal factor in major incidents. Poor change and project management also risks the efficiency and performance of the rail system. I'm asking the industry to ensure that mistakes from the past are not forgotten but are instead at the forefront of our minds and used as a test bed for new proposals. Maintaining corporate memory and having simple, effective, change management and supporting assurance processes will be essential.

I will ensure that my teams continue to be involved in transitioning towards any rail reform, providing advice on good health and safety principles, and that we do not allow planning and delivery of change to be a distraction from our crucial frontline activities. The industry must do the same.

2. Leadership, people, and capability

Given the pressures on the industry, there will need to be a firm focus on maintaining and improving the health, safety and welfare of the workforce, passengers, and public. This will require strong leaders to make timely and effective decisions. We cannot operate in an environment where there is inappropriate, unnecessary challenge and delay to addressing clear cut health and safety issues. Having the right capability, at the right level, in the right places, has never been more important.

After a long period of challenging industrial relations, the industry must continue to engage and collaborate with our Trade Unions on important health and safety issues. It is essential that we invest in our people and continue to break down barriers.

It is really important that a strong connection exists between those in senior, strategic decision-making roles and colleagues who work on the frontline. Nurturing an environment where there is a good level of visibility and understanding of what is actually happening on the ground is key to effectively delivering a high-performing, healthy, and safe railway.

We will focus on continuously improving our ways of working – with particular focus on activity

planning, pace, and enforcement. This includes reviewing our regulatory approach to ensure we are strategic, effective, and transparent in all that we do.

3. Maintaining focus in challenging times

Given this challenging context and the very real potential for distraction it presents, it's never been more important for the industry to ensure that there is a relentless focus on delivering a healthy and safe railway, every day, without fail. Having a good understanding of assets, their condition, how they behave in a changing environment, and maintaining them effectively, has never been more important.

The safe stewardship of our railways is a collective industry responsibility, and our industry is at its best when it harnesses the power of collaboration and comes together to fix important problems. Ensuring that the right issues are focussed on and striving for further improvements in management maturity across boundaries, will be key in this regard.

My team and I will be clear in articulating our priorities, and where necessary, taking robust action where we consider it's required.

Our leadership and looking forward

Since our last Annual Report, our former Chief Inspector Ian Prosser CBE has retired after 16 years' dedicated service. Ian has achieved a huge amount in that time, and I want to formally recognise the positive impact his strong collaborative, 'firm but fair', regulatory approach has had across the industry. Thank you, Ian, for everything you have contributed. We are all very grateful and you will be missed.

To effectively deliver our regulatory functions, we rely on every part of the industry to play their part. I am grateful to the many individuals and organisations who have stepped up to make a difference, and where necessary, challenge others during the year.

Our people are our greatest assets – on that note, I'd like to thank my colleagues across the organisation for all that they do.

Finally, I expect this year to be a continuation of my transition into the Chief Inspector role. I will be looking for opportunities to evolve our approach and deliver '**regulatory excellence**' in all that we do to achieve a healthier and safer railway in the most effective, efficient, and sustainable way possible.

Strong collaboration with all parts of the industry and being true to our values as an independent regulator will be key guiding principles on this journey. I look forward to working with you during the year ahead.

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

Introduction

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 by the railway sectors. We set out the evidence supporting our conclusions, including (where appropriate) the results of our Risk Management Maturity Model (RM3) assessments. RM3 is one of our key tools for assessing health and safety management systems. 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 5-level scale to assess performance and identify areas for

improvement; for more information on RM3, the assessment criteria and 5-level scale, please see Risk Management Maturity Model (RM3) 2019.

How ORR assesses harm and risk performance

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

- identify trends and quantify risk;
- set the correct risk control priorities; and
- measure performance.

ORR uses industry information about actual harm and modelled risk to measure health and safety performance on Britain's railways:

- **actual harm** caused to individuals, which is measured using the Fatalities and Weighted Injury (FWI) index. It is a composite measure of risk or harm that combines fatalities with physical injuries, which are weighted according to their relative severity.
- **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 Precursor Indicator Model (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.

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:

- **Inspections**, where through our planned, proactive work we examine the management and control of risk 'on the frontline'.
- **performance indicators**, for example, near-miss events, which had the potential to cause harm;
- **content indicators**, such as asset management performance; and
- **context indicators**, such as measures of safety management culture and duty holders' risk

management values.

When analysing harm over time, it is important to consider the annual trends of passenger numbers and freight traffic. More information on rail usage can be found on ORR's Data Portal.

This Annual Health and Safety Report uses final and some provisional railway data from within ORR and across the industry. Our Rail Safety Quality Report sets out our main data sources. Data for non-mainline operations is primarily based on reports submitted by duty holders under the Reporting of Incidents, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR), either from LUL's Information Exchange (IE2) or our own online RIDDOR reporting tool. However, we also use reports supplied by duty holders and industry bodies such as the LRSSB, UK Tram and the Heritage Railway Association.

Confirmed safety data for April 2023 to March 2024 will be issued in our rail safety statistical release, scheduled for publication in September 2024. It will contain finalised numbers from both mainline and non-mainline sectors.

Mainline: Network Rail

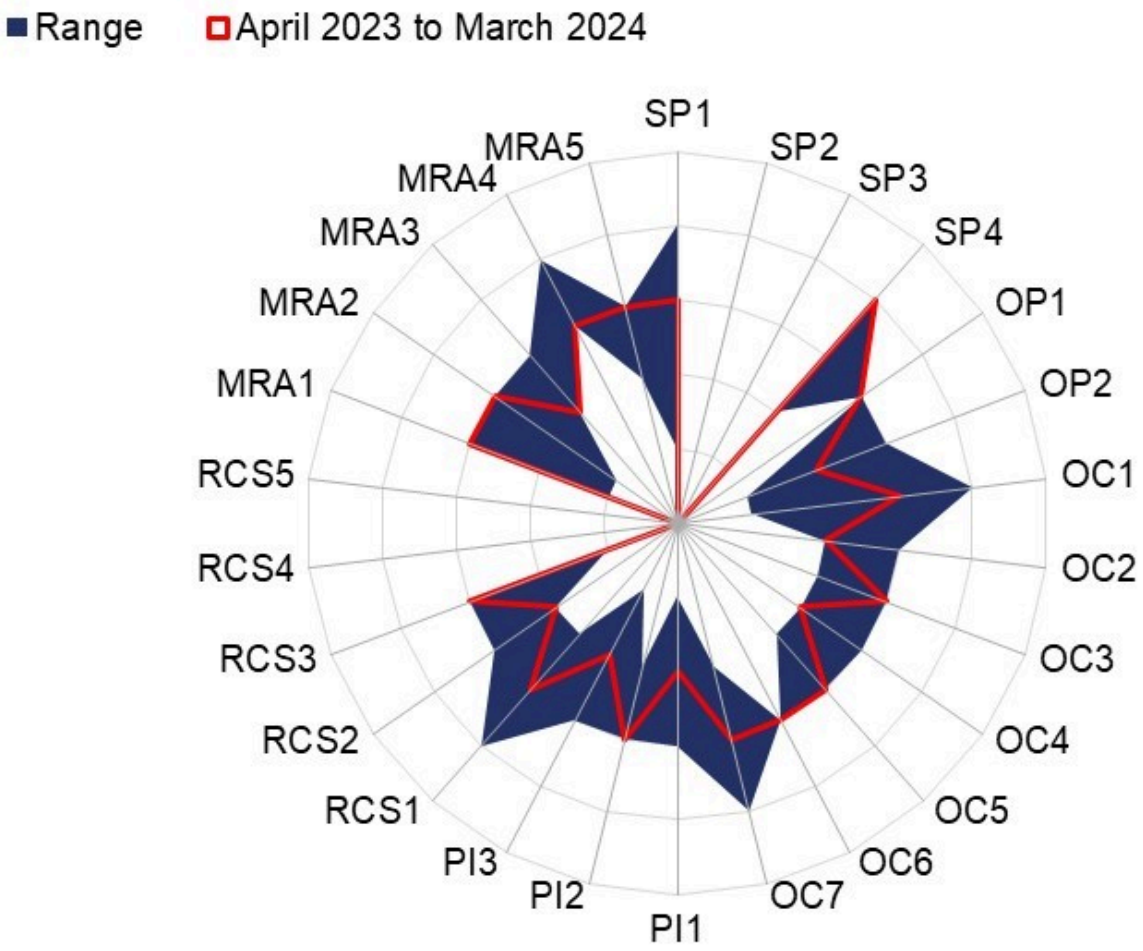
Key messages:

- 2023 to 2024 saw Network Rail maintain good performance but facing continuing challenges with managing asset safety in the face of weather-related risks, especially from extreme weather. Although still being implemented, Network Rail's Modernising Maintenance reforms have the potential to deliver efficiencies but need to be done in a way that does not overload people with too much change too quickly, nor result in fatigue. Network Rail has delivered effective change safely through trackworker safety reforms. It needs to do more to embed the changes through sustainable ways of working that allow maintainers the track access they need as it continues its reorganisation of maintenance work.
- Network Rail needs to maintain its focus on providing a safe and resilient railway as it enters Control Period 7. It needs to prioritise its people and their capability to maintain the safety of the network as it continues to implement maintenance reforms, and it needs to continue to deliver effective improvements to trackworker safety by embedding sustainable change.

Network Rail's management maturity

RM3 assessment of Network Rail's management maturity is based on the evidence we gather from our inspections and other regulatory work. It offers an objective, independent view of maturity. This year we assessed 22 (out of 26) elements. Last year we assessed 3 elements at 'managed' and 18 at 'standardised'. This year we assessed 1 at 'predictable', 7 at 'managed' and 14 at 'standardised'.

Figure 1: Network Rail 2023 to 2024 RM3 Assessment



Source: ORR

Table 1: Network Rail 2023 to 2024 RM3 Assessment

Code	Description	2023 to 2024 Assessed Level	Min	Max
SP1	Leadership	3	1	4
SP2	Health and Safety Policy	Not Assessed	n/a	n/a
SP3	Board Governance	Not Assessed	n/a	n/a
SP4	Written Safety Management System	4	2	4
OC1	Allocation of Responsibilities	3	1	4
OC2	Management and Supervisory Accountability	2	2	3
OC3	Organisational Structure	3	2	3
OC4	Internal Communication Arrangements	2	2	3

Code	Description	2023 to 2024 Assessed Level	Min	Max
OC5	System Safety and Interface Arrangements	3	2	3
OC6	Organisational Culture	3	n/a	n/a
OC7	Record Keeping, Document Control, and Knowledge Management	3	2	4
OP1	Worker Involvement and Internal Co-operation	3	3	3
OP2	Competence Management System	2	1	3
PI1	Risk Assessment and Management	2	1	3
PI2	Objective and Target Setting	3	2	3
PI3	Workload Planning	2	1	3
RSC1	Safe Systems of Work Including	3	2	4

Code	Description	2023 to 2024 Assessed Level	Min	Max
	Safety Critical Work			
RSC2	Management of Assets	2	2	3
RSC3	Change Management (Operational, Process, Organisational, and Engineering)	3	1	3
RSC4	Control of Contractors and Suppliers	Not Assessed	n/a	n/a
RSC5	Emergency Planning	Not Assessed	n/a	n/a
MRA1	Proactive Monitoring Arrangements	3	1	3
MRA2	Audit	3	1	3
MRA3	Incident Investigation	2	2	3

Code	Description	2023 to 2024 Assessed Level	Min	Max
MRA4	Management Review	3	3	4
MRA5	Corrective Action	3	2	3

Source: ORR

Our overall assessment is that Network Rail is at the 'standardised' level of management maturity. This is the same as last year's assessment. However, this year, we found less consistency. We assessed more criteria at 'managed' than last year. This might suggest a lessening of overall management maturity. Our evidence is drawn from our inspections and investigations which, of necessity, tend to highlight known weaker areas. Nevertheless, compared to last year's assessment which focused similarly on weaker areas, the consistency of maturity appears diminished.

Our overall perception is unchanged from last year; the degree of leadership on a given topic or risk does much to determine overall attainment. Whilst Network Rail has many processes, procedures and standards to manage risks, it manages those best where leaders give their attention.

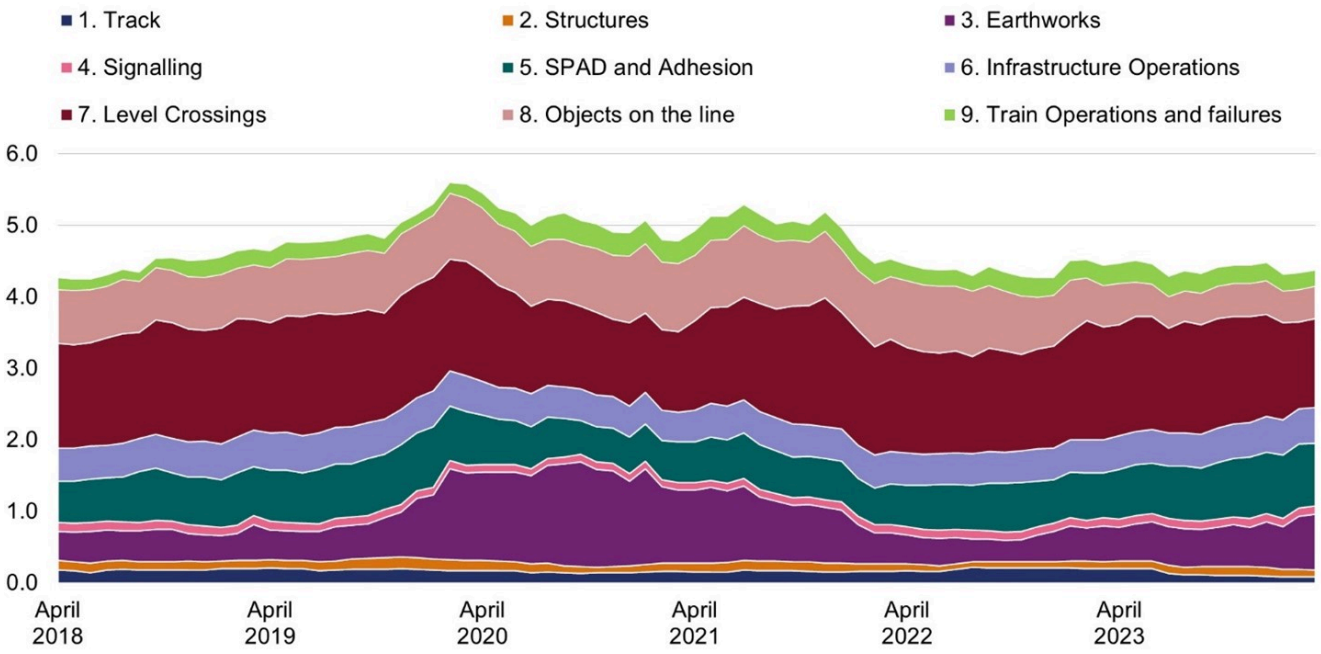
Without this attention, Network Rail can be slow to achieve commitments necessary to bring them into legal compliance. We found this was the case with reducing earthworks and structures inspections backlogs, and the completion of drainage asset surveys. Both these matters have taken and continue to take much time and effort on our part to secure improvements. Recognising, accepting, and delivering robust action where basic requirements are not being met would show a mature approach to safety management that does not accept as 'business as usual' long term non-compliance with standards. Network Rail needs to apply leadership focus to proactively ensure that its own standards are being met across the network.

Risk performance

There were 33 train accident risk high potential incidents this year, significantly more than the 20 incidents in 2022 to 2023. (All figures from Network Rail Safety, Health & Environment Performance (SHEP) Report, 2023-24 period 13). Although higher this year, the number is in line with fluctuations seen in the past, and often related to poor or extreme weather. Near misses or glancing collisions with road vehicles at level crossings feature most prominently, followed by signals passed at danger (SPADs) with potentially high consequences, then trains passing over or near debris from earthworks and bridge failures or passing over unsupported track from embankment failures. Other failures comprised risks from faulty, speeding and runaway trains and striking fallen trees.

The Rail Safety and Standards Board (RSSB) Precursor Indicator Model (PIM) is the way Network Rail measures failures that have the potential to result in a catastrophic accident. Looking back over Control Period 6 (the last 5-year funding period between 2019 to 2024), the trend in overall precursor risks was dominated by variations in earthworks failures, especially between 2020 to 2022, largely related to adverse weather conditions, as well as an increase in SPAD and adhesion events. These trends were partly offset by a reduction in level crossing risk and objects on the line. Numbers of other risk events were broadly static across the control period. Comparing the start and end of the control period, the level of precursor risk remained largely unchanged. (PIM chart generated from RSSB website tool on 10 April 2024, latest data at time of writing.)

Figure 2: Precursor Indicator Model (PIM)



Source: RSSB

In 2023-24 the overall level of precursor risk was similarly largely unchanged. Earthworks failures increased towards the end of the year, and SPAD and adhesion risk rose steadily throughout the year. These rises were offset by prolonged reductions in risk from level crossings and objects on the line. (Data and chart generated from RSSB website tool on 11/4/2024).

Occupational Health and Safety performance

Network Rail's occupational health and safety performance was broadly neutral in 2023 to 2024. The fatality weighted index (FWI), a measure of accident severity, improved slightly in the year. Network Rail's long-term injury frequency rate (LTIFR) increased very slightly over the year. Most accidents are caused by slips, trips and low falls.

There were 19 workforce safety high-potential incidents in 2023 to 2024. By far the largest single cause involved near-misses to track or trackside workers in line blockages, or associated line blockage irregularities. It shows a substantial reduction from 29 incidents in 2018-19, immediately before ORR's enforcement action requiring improvements to track worker safety.

Occupational health achievement continues to be positive in some important areas. Following difficulties achieving compliant timescales for hand-arm vibration (HAVS) health surveillance, Network Rail is achieving good compliance rates, at or near 100%. In part this might explain why

numbers of HAVS cases have risen substantially from 15 cases in 2022 to 2023, to 23 this year. We also support the continued work to provide occupational health clinics to the workforce.

Asset safety

The current rate of high-consequence earthworks failures is at its highest since the inception of this metric in 2008 (graph supplied by Network Rail). Failures are closely related to poor and extreme weather, especially high rainfall. The failures illustrate the importance of good drainage asset knowledge and effective inspection and maintenance regimes.

That there have been no derailments as a consequence of earthwork failure shows the importance of managing the consequences of failure through remote and on-site monitoring, as well as forecasting and speed restrictions, subjects we continue to pursue through our inspection activity.

Graphs showing annual potentially high consequence earthworks failures and annual derailment rate. Potentially high consequence failures are those scoring 50 and above based on the CIV/185 standard.

Figure 3a: High consequence earthworks failures

Source: Network Rail

Figure 3b: Annual derailment rates

Source: Network Rail

Throughout 2023 to 2024 we continued to challenge Network Rail to improve its knowledge of drainage assets and systems, and to establish adequate inspection and maintenance resource levels. These priorities were partly in response to recommendations made by Lord Mair and Dame Julia Slingo following the Carmont derailment in 2020, but also reflected our longstanding concerns around earthworks and structures resilience in the face of increasing numbers and intensities of extreme weather events. Having an accurate picture of the nature and location of drainage, and having sufficient people to maintain it, are both essential prerequisites to an effective maintenance and inspection regime and thus effective drainage.

In 2020 to 2021 Network Rail committed to completing drainage asset survey reviews by the end of March 2024. 3 regions met this deadline but 2 – Southern and Eastern - did not. However, they both provided credible plans to complete the work by the end of May and October respectively which we continue to monitor to completion. North West and Central and Scotland regions met their targets for providing sufficient resources to carry out drainage inspections and maintenance by employing external contractors. The remaining 3 regions continue to recruit staff, using contractors in the interim.

The resources that have been provided are not necessarily dedicated resources, the original intent

of the Mair recommendation. We look forward to Network Rail completing its asset surveys and demonstrating delivery of effective drainage maintenance and inspection using non-dedicated staff and sub-contract labour. We will continue to engage with Network Rail on this topic.

We obtained clarity from Network Rail on progress towards implementation of the Mair/Slingo recommendations by the Weather Risk Task Force (WRTF). Our visibility of progress is much improved. At the time of writing Network Rail has implemented nationally four of the 18 Mair recommendation related action plans, focused on updating Network Rail's policy and controls, and modelling surface water threats. A further 6 action plans, focused on practical improvements to drainage and earthworks management, and the establishment of Slope Safety Review Groups, have been implemented in at least one Region.

One of the 5 Slingo action plans, on exploiting advances in forecasting to improve operational safety and performance, has also been implemented centrally. We engaged with Network Rail on PRIMA (Proportionate Risk Response to Implementing Mitigating Speeds to Assets), a programme that aims to balance the need to reduce the consequences of extreme weather through speed restrictions, with maintaining train performance to minimise disruption and inconvenience to passengers. PRIMA is being trialled and we await results to demonstrate it will deliver sufficient levels of safety, and whether PRIMA will drive decisions or be a decision support tool sitting alongside local knowledge. We will continue to monitor developments in this area.

Network Rail struggles to deliver enough earthworks and structures examinations. Nationally, structures examinations compliance has not improved significantly on last year, although there are significant regional variations. For earthworks examinations, although improving from last year, backlogs remain above historic levels. Regular examinations are essential to ensuring the continued safety of structures and earthworks and we continue to monitor progress towards improvements in this area.

Track and lineside

The safety of the track continues to be well managed through inspection and maintenance activity. However, it is vulnerable to human failings. Safety is dependent on an inspection, maintenance and corrective action regime that relies on competent people following the standards - doing the right things, in the right way, at the right time. Our investigation into a rail break at Colton Junction on East Coast route in May 2023 shows that without effective leadership, adequate resourcing and robust monitoring, track integrity can be seriously compromised. Track

integrity also relies on the inspection and maintenance regime evolving over time as train tonnages increase and as new rolling stock is introduced. We continue to explore these areas with Network Rail to ensure that the lessons from incidents such as rail breaks, are fully learned.

The year saw a number of collisions with fallen trees, brought down by high winds (e.g. Broughty Ferry, December 2023, Thetford, February 2024). Though the potential was present, none of these resulted in serious incidents or injury. Positively, Network Rail has made efforts to map vegetation and identify potentially falling trees and we continue to look for progress in this area. We recognise this is a challenging topic. Whilst judgement and analysis go so far, there remains the unpredictable element of hidden weakness or loose soil. Another challenge is dealing with trees on neighbouring land.

Trackworker safety

Following our enforcement action in 2019, and Network Rail's improvements to trackworker safety, we carried out a series of inspections across the network. These inspections were aimed at gaining insight into the work being done to embed long-lasting, sustainable changes in culture and working practices around track access for maintenance, and how Network Rail has continued to drive further change and innovation. Positively, we found that the routes were consistent in their dedication to embedding safer working practices and driving continued improvements, and generally open to engaging with and learning from other areas of the organisation and the wider industry.

The pursuit of flexible, efficient technological and procedural solutions appears to be strong, with numerous trials planned or active across the network. In the meantime, access to and use of additional protection (AP) in line blockages has been gradually increasing, though securing improvements has been challenging. The introduction of equipment to protect workers from, or warn them about approaching trains, such as remote track circuit operating devices (remote T-CODs) and semi-automatic track warning systems (SATWS) has been particularly fraught, with significant delays and concerns around reliability, performance, and placement. Network Rail needs to do more to maximise the potential of available technology.

Although there were no accidents, near-misses continued to happen. The main causes were (1) trains mistakenly signalled into line blockages, and (2) workers on open lines but believing themselves to be in a possession or line blockage. The next 5 years will require Network Rail to identify and adopt solutions to provide more efficient track access which delivers the time and

quality of access to maintain the network. This will require improvements to trackworker safety technology and procedures to facilitate more efficient access, particularly better AP and train warning systems, whilst maintaining the cultural shift.

Modernising maintenance

We engaged centrally and at route level with Network Rail as they planned for, and introduced, Modernising Maintenance. This initiative aims to maximise use of maintenance resource through re-setting resource levels, eliminating unnecessary maintenance work, and changing working patterns. Like all changes to safety-critical maintenance work there is the risk that, if done in a rushed or poorly managed way, essential maintenance work could be done badly, or not at all.

We inspected the introduction of Modernising Maintenance in 4 routes, focusing particularly on the ability to maintain a safe railway, consultation with trades unions safety representatives, how specific route challenges are identified and addressed, and whether maintenance resourcing is robustly assessed and maintained at appropriate levels.

Overall, we found a sensible and mature approach to managing change. A robust change management process identified national and local risks and ensured that these were appropriately considered. We also found that safety representatives were appropriately consulted on the changes. Less positively, in some places we found a maintenance organisation that faced challenges delivering all that is required, with high levels of backlogs and deferrals of scheduled work, staff working long hours, and fewer staff to call on. It is too early to know whether Modernising Maintenance will deliver all that it promises.

At the moment, we believe that Network Rail has the processes and standards in place that if properly implemented will identify and control the risks of any shortcomings in the effectiveness of maintenance work that might arise as an unintended consequence of the changes. We will continue to monitor this major change to established ways of working through further inspections, planned for 2024 to 2025.

Electrical safety

We continued to monitor progress made against commitments in the Electrical Safety Delivery (ESD) program. Network Rail progressed the deployment of the negative short-circuiting devices and track circuit switches in conductor rail areas that has eliminated the need to use 34,000 earthing straps over the past 5 years. The plan is to have 80% coverage across the 3rd rail network by the end of 2029. Work continues on the development of remote securing of isolations, an improvement that promises better safety and more time for maintenance work on track. This roll out is dependent on the successful introduction of the delayed Traction Power Control Management System (TPCMS).

Following our enforcement action in 2021 concerning safety in demarcating overhead line equipment (OLE) isolations and ensuring electrical equipment was dead before working, we assessed Network Rail's continuing work to assure themselves that the new procedures they introduced were being followed. This work was carried out across all regions with inspectors carrying out joint work with Network Rail and their contractors. We found a positive picture of continued embedding of significant improvements in this area.

Human factors

Following Network Rail's reduction in in-house human factors expertise in previous years, we

continue to have concerns about the ability of its suppliers to robustly assess and mitigate risks associated with human factors. Shortcomings in this area can have long-standing and unforeseen consequences if the human interface is not optimised when new equipment is introduced. We remain concerned that Network Rail lacks the capacity to challenge suppliers to deliver good human factors work, and we continue to press for a more proactive, better resourced approach to this topic. This includes meeting with the Network Rail Human Factors Lead on a quarterly basis to understand their current priorities and approach.

Fatigue

Throughout the year we have been concerned at high numbers of fatigue exceedances, where Network Rail staff worked longer hours than allowed by their own standards. We welcomed positive developments such as fatigue risk training for maintenance rostering clerks and resource managers, as well as recent improvements in using fatigue assessments and fatigue management plans to ensure that, where people need to work longer hours, the risks are assessed, and appropriate mitigations put in place. These measures reflect some effort made to raise awareness of fatigue risks within Network Rail. We recognise that reducing exceedances and managing fatigue risk is a complex task that will require addressing established ways of working, staff retention issues and industrial relations matters. However, Network Rail should continue to move towards the standards set out in good practice guidance and ensure that their own internal standards are aligned.

Level crossings

Tragically there was 1 accidental fatality in 2023 to 2024, at Pooley Green crossing in Surrey in October 2023. This compares to 5 accidental fatalities in 2022 to 2023 and 7 in 2021 to 2022. Near-misses declined from a peak in the early part of 2023 to 2024. Overall, there were 426 near misses with pedestrians and 56 near misses with road vehicles in 2023 to 2024.

Although undoubtedly related to wider societal factors, the reduction probably also reflects Network Rail's efforts at educating users and raising awareness. Although the overall trend is positive, near-misses with pedestrians continue to rise at footpath crossings. This maintains a trend since 2020. Positively, we noted Network Rail's continued development of technology, as well as exploring ways of reducing the cost of existing technology, to provide better warning at footpath and user worked crossings.

Overall risk from level crossings, as measured by Network Rail's All Level Crossing Risk Model (ALCRM) reduced very slightly in 2023 to 2024, probably reflecting that there are fewer 'easy wins' still available in the form of level crossing closures or potential for upgrading risk controls at crossings. (National SHEP 2023 to 2024 P13)

Our focus this year continued themes from previous years, in particular monitoring delivery of Network Rail's 'Enhancing level crossings safety strategy 2019-2029'. In this context we noted positive engagement on revising signage at private crossings and devising and rolling out 'another train coming' signs.

Occupational health

We have been focusing our occupational health regulation at Network Rail on the risks arising from welding fume. This work started a number of years ago with our interest in the control of weld fume increasing following the issue of a Safety Alert by the Health and Safety Executive in February 2019 setting out the new evidence that all types of welding fume can cause lung cancer and limited evidence pointing to a link with kidney cancer.

This work has seen us challenge Network Rail on their approach to the assessment of welding fume and the application of the hierarchy of risk control to its welding operations. We found disappointing progress and have been challenging Network Rail to assess risks robustly and implement suitable and sufficient control measures in line with other industries, rather than placing a reliance on lower-level controls such as respiratory protective equipment.

Operations

We continue to note and investigate events where trains have exceeded maximum permanent or temporary speed limits, for example at Wood Green and Melton Lane level crossing, in June 2023.

Generally, there is a lack of data on the nature and prevalence of these events, with the suspicion that these events are grossly under-reported. Modern trains also accelerate more quickly and quietly than older trains. We also note a continued rise in signals passed at danger (SPAD's), especially involving empty coaching stock and freight movements.

For these reasons we welcome Network Rail's Control Period 7 business plan commitment to explore a driver speed advisory system that would give the driver real-time speed limit and

exceedance information as well as automatic over-speed braking. Overall, Network Rail needs to be working to secure a settled, industry-wide approach to future train protection and speed supervision.

Health and Safety by Design

Our current approach to Health and Safety by Design is set out in our Strategic Risk Chapter. Our work continues to look at areas to encourage and promote the early consideration of design impacts on health and safety and potential solutions at the earliest opportunities, in particular at the design stages of rail projects.

We continue to work with existing duty holders and industry stakeholders to ensure that safe and healthy design solutions are assessed and adopted throughout the whole of the project lifecycle in order to proactively reduce risks as low as reasonably practicable, reflecting the general principles of prevention, as set out in Schedule 1 (The Management of Health and Safety at Work Regulations 1999. This year, we have continued our monitoring of projects such as HS2, specifically through regular engagement at the project's System Review Panel (SRP), liaison with key

stakeholders, and other regulators such as HSE, the Environment Agency and Local Authorities. There has been an additional focus on changes post the government's decision to not extend HS2 beyond Birmingham, while taking a new approach to Euston Station.

We also support third party proposers and promoters of local transport schemes such as local Councils, providing guidance on legal requirements at an early stage including promoting good practice in risk assessment in support of designs. This is supplemented by our continued work and collaboration with the DfT and Network Rail on the Better Value Rail Toolkit, intended to provide a simpler pathway to selecting and progressing the right transport solutions.

We continue to engage in ORR's formal "permissioning" functions, including delivery of Authorisations under the Railways (Interoperability) Regulations 2011 (as amended) and Safety Certification and Authorisation under Railways and Other Guided Transport Systems Regulations 2006 (ROGS) and certain other specific approval or authorisation duties under varied items of private legislation linked to specific transport systems. Where we have such duties, and where appropriate, we have sought evidence that health and safety by design has been addressed through the change management processes.

Mainline operators

Key messages:

- in 2023 to 2024 we have seen improvements in the industry's investigation of Signals Passed at Danger (SPADs) where the RSSB incident factors have been used. However, the number of SPADs that are attributable to driver's actions increased in 2023 to 2024, we consider that industry is at the limit of human reliability and there will not be a significant change until there is a committed, settled, industry-wide approach to future train protection and speed supervision. We welcome Network Rail's Control Period 7 business plan commitment to explore a driver speed advisory system that would give the driver real-time speed limit and exceedance information as well as automatic over-speed braking
- train operating companies are not implementing effective change management when modifying existing train fleets and introducing new fleets. This is too often leading to a regression in risk mitigation, replacing reasonably practicable engineering controls with human intervention

The mainline operators comprise charter operators, passenger train operators (TOC) and freight

operating companies (FOC) that operate over infrastructure controlled by Network Rail and Amey Infrastructure Wales Limited (Seilwaith Amey Cymru).

Signals Passed at Danger (SPAD)

2023 to 2024 was the final year of our 3-year inspection of SPAD management by passenger and freight operators. We targeted the operators' own investigations of their most serious SPADs occurring in the work-year. We found that increased use by driver managers of the RSSB incident factors (described in our report last year) had improved the quality of their investigations. Along with knowledge and application of non-technical skills, this led to improved development plans for drivers designed to reduce the likelihood of recurrence.

There has been an increase in the most serious (category A) SPADs which are attributable to drivers actions over the last 3 years. In March 2023 the annual moving total was 10 Category A SPADs and in March 2024 it was 13 SPADs. We continue to investigate all Category A SPADs because of the potential for a catastrophic outcome along with incidents where drivers have significantly exceeded the line speed (over speeding).

Figure 4: SPADs

Source: Rail Delivery Group

This year we have undertaken permissioning work associated with the introduction of the European Train Control System (ETCS) on lines from Old Oak Common to Heathrow Airport. ETCS operation is a higher level of risk control than the Train Protection and Warning System (TPWS) which it supersedes. ETCS is a speed supervision system and provides mitigation against overspeeding and SPADs.

Further schemes are coming online. The 18km section of the East Coast mainline between Welwyn and Hitchin migration to ETCS is planned for 2025. We are working with passenger and freight operators, through our attendance at industry risk groups, to ensure there is cooperation with Network Rail and they are ready for the transition, so that the benefits of ETCS are realised early and the migration is not drawn out. In terms of reducing the number of SPADs, we consider that industry is at the limit of human reliability and there will not be a significant reduction in SPADs until there is a committed, settled, industry-wide approach to future train protection and speed supervision. We welcome Network Rail's Control Period 7 business plan commitment to explore a driver speed advisory system that would give the driver real-time speed limit and exceedance information as well as automatic over-speed braking.

Rolling stock management

Operators of Mark 1 Rolling stock require exemption from regulation 4 of the Railway Safety Regulations 1999 (RSR), by demonstrating adequate crashworthiness and over-riding measures. This year we continued our work to assess the capability of these operators and undertook targeted inspections of vehicles and record keeping. Across all these inspections we found suitable arrangements were in place, with some operators going further; for example, by fitting removable inspection plates to allow more frequent inspection of vulnerable parts of the steel body prone to corrosion.

We have continued our focus on the use of hinged door rolling stock (relying on exemptions from regulation 5 of RSR). Many operators are now fitting Central Door Locking (CDL) to hinged door stock, and we have seen good progress in achieving their committed timescales. Also, in line with our policy, another operator improved risk controls by reducing their operating speed to 25mph. All of these operators have gone on to now address the associated risk from drop light windows, preventing a passenger or member of staff from leaning out of an open window and placing themselves in danger of serious personal injury.

Photo: Vintage trains fitment of a central locked door bolt

We have assessed the change management arrangements of operators introducing new trains. Our expectation is that operators will ensure health and safety by design and take the opportunity to improve risk control with technology, such as the extending steps on Stadler trains, which in most situations eliminates the gap at doorways between train and platform. Instead, we have seen operators remove reasonably practicable engineering controls, choosing instead risk controls reliant on people, for example the switching-off of speed supervision systems on existing fleets or introduction of replacement fleets without compatible equipment. This will be the subject of further investigation.

We also took action during the year to tackle non-compliance with the law in relation to rolling stock matters, with 2 Improvement Notices served on Chiltern Railways associated with arrangements in place for persons with reduced mobility.

Cyber security and software change management

We have continued to build upon the work undertaken in 2022 to 2023 to look at the control of safety risks posed by cyber security and poor software development and assurance arrangements. We conducted a number of inspections that looked at the processes train operators have in place to manage their digital systems, including software change management arrangements to ensure safe operation. This inspection work was aimed at developing an initial understanding of the rail sector's management maturity in this rapidly changing area. Findings have been mixed with elements of good practice; however, the inspections have identified areas for improvement including improved cooperation between train operator safety and security teams to identify and mitigate safety risks and more robust supply chain and change management assurance. Further inspections are planned in the next work year.

Collaboration with industry groups

This year we have continued our support to industry groups including RSSB's People on Trains and Stations Group (PTSRG), National Freight Safety Group (NFSG), Asset Integrity Group (AIG) and the Rail Wellbeing Alliance (RWA) as well as Rail Partners Passenger Operators Safety Forum. We have 'observer' status at these meetings, which gives us the opportunity to share and explain changes to our guidance, highlight emerging risks and efficiently raise other regulatory matters where the whole sector is affected. This year we became regular observers at the Freight Safe Steering Group, described in the case study below.

Case study 1: Freight Safe Steering Group collaboration in practice

Background

The NFSG reports into the Freight Safe Steering Group (FSSG), which in turn provides governance

and assurance to the Rail Partners Freight Council for delivery of the industry's Freight Safe Programme. The group was formerly known as the National Freight Safety Group Steering Group.

Observer status

ORR attends FSSG as an observer rather than full member and does not take part in decisions made by the group. For the next five years (Control Period 7 from 2024 to 2029), FSSG has a fund of £15.9 million to deliver strategic projects to improve health and safety in the sector. Our attendance now means we have a clear picture of the projects and their delivery. These projects include:

- Wagon Condition Programme – including;
    1. Engineering of wagons i.e. how they are built and maintained
    2. Train preparation and planning
    3. Technology lineside and on wagons to detect problems before failure
    4. Adhesion
    5. Contractual arrangements for safety critical equipment for European Entities in Charge of Maintenance operating in the UK
- Horizon scanning
- Freight Safe Insights - the development of a freight sector Precursor Indicator Model (PIM)
- climate change

The Wagon Condition Programme draws together several workstreams at risk of duplicating work to address RAIB recommendations for Llangennech and other incidents. As observers, ORR will have good oversight of the programme, and opportunity to influence, as we report on progress to address the RAIB recommendations.

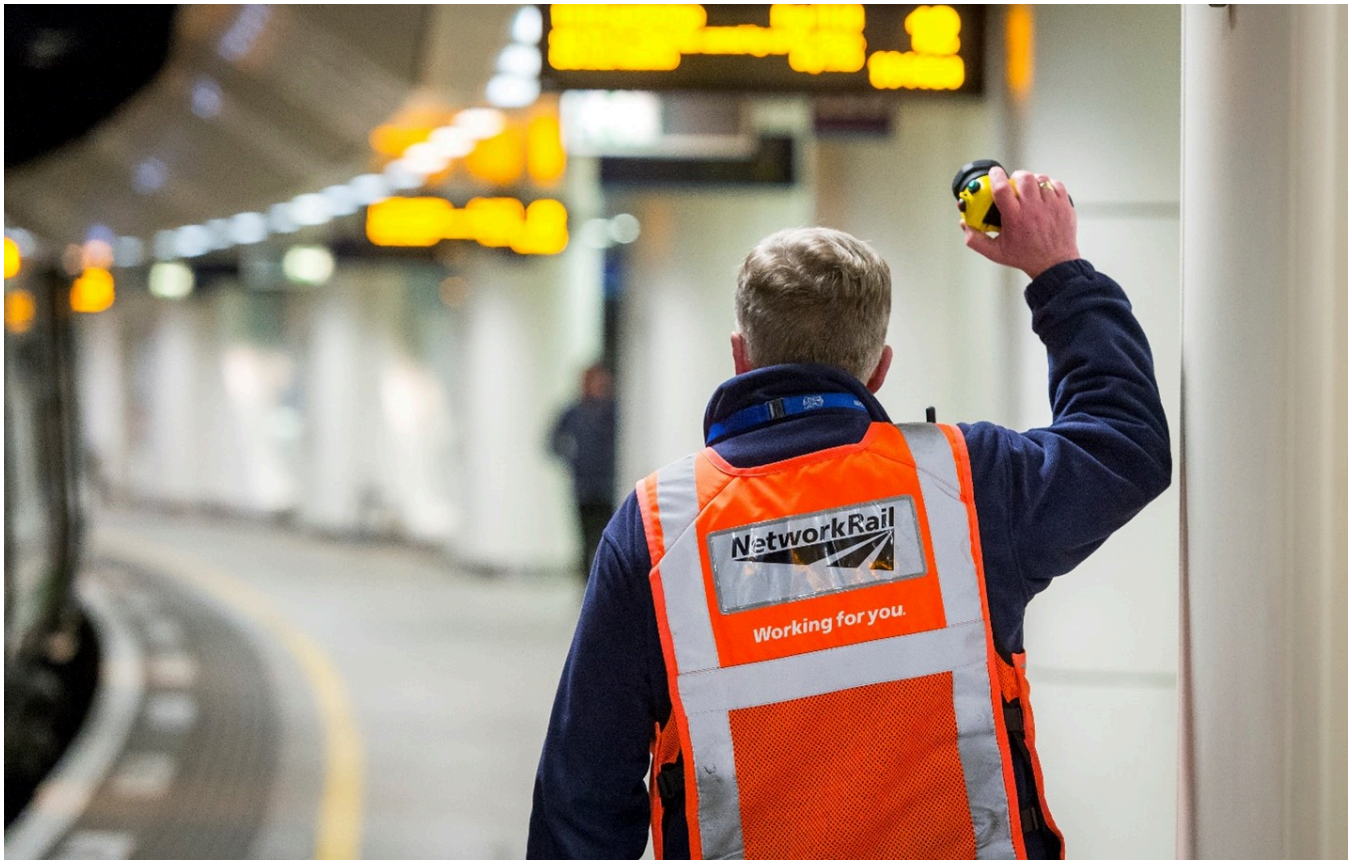
The Horizon Scanning and Freight Safe Insights work will give us the opportunity to share with the sector our own thinking on emerging issues, such as ETCS preparedness and how fatigue is managed by the sector. We will also be able to draw from FSSG intelligence to inform our own health and safety risk profiling.

"ORR attendance at FSSG ensures we have a fully rounded perspective from operators, NR, RSSB and ORR. This is vital in informing our discussions and shows a real level of maturity in cross industry collaboration in risk mitigation."

Geoff Spencer Chair, Freight Safe Steering Group

Platform Train Interface

Last year we highlighted the work being done by RSSB to revise its Platform Train Interface (PTI) Risk Assessment Tool (RAT). With challenge and support by ORR, RSSB and train operators have collaborated to refresh the tool, fix known issues, update existing features and add new functionality. Following a relaunch in 2023, the tool has attracted greater usage in the sector and improved collaboration on risk control available for different operators using the same platforms.



Excellent work was undertaken by RSSB in 2015 to develop a strategy for managing risks at the PTI. Through our membership of RSSB's People on Trains and Stations Risk Group (PTSRG) we asked the group to review the 2015 strategy, as work around a wider 'Rail Health and Safety Strategy' was underway by RSSB this year. PTSRG committed to review the 2015 PTI strategy and this work is well underway with ORR represented in the working group.

The 6 elements of the original strategy included:

- data and intelligence gathering
- passenger movement through the station and across the PTI
- train stopping positions, dispatch, monitoring the dispatch corridor and emergency stopping once dispatched
- optimising the step and gap
- accessibility, including how accessibility can be improved without affecting performance and safety, and
- performance and capacity

Early emerging thinking indicates that accessibility should not sit in isolation but be an integral part of the remaining 5 themes to be carried forward. ORR fully supports this approach and the groups' focus on innovation and continuous improvement in risk control.

Transport for London (TfL)

April 2023 to March 2024 was a significant year for Transport for London railway operators, with passenger numbers continuing to recover towards pre-pandemic levels.

We have assessed Transport for London's management maturity based on evidence we gathered from inspections and other regulatory work.

This year we assessed 14 (out of 26) elements; however, we were only able to gather limited evidence for some elements. The main elements scored included:

- OP2 – Competence Management System
- RSC1 – Safe Systems of Work including safety critical work
- MRA1 – Proactive Monitoring Arrangements
- MRA3 – Incident Investigation

All continue to demonstrate risk management maturity in the 'standardised' to 'predictable' ranges.

We have continued to develop and build strong collaborative relationships with TfL through regular liaison meetings and continue to provide health and safety scrutiny through proactive and reactive inspection activities.

London Underground Limited (LUL)

Track worker safety

We have continued engagement with LUL in relation to track patrolling, following the Chalfont and Latimer incident, where a track worker was struck and injured by a train.

During the 2023 to 2024 year, LUL changed its working arrangements to significantly reduce the activities which require staff to access the track during the hours when trains are operating.

29 out of 31 track patrols were moved to engineering hours (when trains do not operate) with plans in place to move the remaining two in the near future.

Despite the significant work done by LUL, there have been a substantial number of incidents in the first half of 2023 to 2024 with protection staff accessing the track, not in accordance with the Rule Book, which requires them to witness the last train before accessing the track.

Although there were no injuries, this highlighted the need for improved risk control and we wrote to TfL to obtain assurance on interim actions, whilst further technical solutions are progressed.

Electrical assets

We completed a series of inspections to continue our focus on LUL's management of electrical assets. These inspections focused on the low voltage (400V and below) distribution systems in station areas. LUL were able to demonstrate how low voltage assets were maintained on both recently installed equipment and assets that were approaching obsolescence. No significant concerns were identified during these inspections.

This work will continue next work year with a focus on smaller stations and will examine how LU manage the risks of low voltage assets located in environmentally challenging areas, for example, those suffering from water ingress, and assess the adequacy of the arrangements in place to maintain safety.

Four lines modernisation

We continued to inspect LUL's change management approach for the complex four lines modernisation programme (4LM) signalling upgrade of the Circle, District, Hammersmith & City and Metropolitan sub-surface lines. The project is introducing Communication Based Train Control system, which will increase capacity and reliability on the Subsurface lines.

We engaged specialist technical consultants to review a sample of project management arrangements and assist with our evaluation of LUL's arrangements. This resulted in a number of recommendations. The inspection will continue into the next work year to ensure these

recommendations are implemented in the run up to the most complex signalling migration area which is due to be commissioned in early 2025.

Platform Train Interface (PTI)

There continued to be a significant number of trap and drag incidents and falls onto the track with no train in the platform. In 2023 to 2024 there were more than 50 instances where a customer fell from the platform onto the track when a train was absent. These incidents highlight that PTI risk continues to be one of TfL railway operators' priorities.

For trap and drag incidents, we are assessing LUL's arrangements for ensuring that train operators are undertaking an accurate check of the PTI after an indication that the doors are closed. Opportunities for improvement remain and TfL are working to improve risk controls to detect the presence of a person on track, incorporating available smart technology using CCTV images, artificial intelligence algorithms and detection models to enable staff to receive notification and insights related to incidents.

Photo: Platform Train Interface on the District Line

Fleet technical and software issues

TfL operators have experienced both technical and software issues. These include spontaneous

capacitor failures on the Aventra class 345 and 710 fleets. Following these incidents, we engaged with the relevant TOCs to assess mitigations in place, which included exclusion zones and alternative walking route for those undertaking work near the affect components.

In response to these incidents the train manufacturer has taken the positive step of replacing the capacitors on both fleets. In addition, there have been technical issues with the rolling stock software and more detail can be found in the case study below.

Asset management

We received 8 incident reports relating to asset management failures, including multiple incidents involving wall, ceiling and roof tiles falling, a floor and boundary wall collapse and issues relating to water ingress. Our enquiries revealed areas of incomplete asset information leading to gaps in LUL's maintenance and management arrangements.

Following these incidents LUL have proposed a general inspection regime over the next 3 years, which will aim to give an improved overarching view of assets, from which ORR can regulate in line with strategic priorities. A proactive inspection on civils asset management is scheduled in the 2024-25 work year to undertake more detailed scrutiny of LUL's asset management arrangements.

Escalators

We have continued to conduct enquiries into 5 escalator incidents, which have resulted in injury and limbs being drawn into the moving parts of the equipment as well as a number of slips and trips. Following one incident where a child suffered fractured bones, cuts and bruises to their foot at Clapham Common station, enquiries identified no evidence of any health and safety breaches at the time. However this remains a key topic area for TfL, and they are working hard with manufacturers and industry partners to identify ways of eliminating or reducing the risk.

Docklands Light Railway

Over the past year, the team has continued to monitor the change management process applied by Keolis Amey Docklands for the testing and introduction of new trains, as well as the maintenance challenges of the current end-of-life fleet. The introduction of a further new fleet is currently behind schedule, due to issues surrounding performance which were identified during testing.

Nevertheless, both the operator and manufacturer have worked well with us to provide assurance so that testing can continue.

Case study 2: Alstom software

Background

MTR Elizabeth line (MTR) currently operates a fleet of 70 class 345 units, which are leased to Transport for London, sub-leased to MTR Elizabeth line and maintained by Alstom as the Entity in Charge of Maintenance (ECM). The fleet operates over 3 separate signalling systems: AWS / TPWS on traditional 3 and 4 aspect colour light signalling, Communications Based Train Control (CBTC) utilising Automatic Train Operation (ATO), and a level 2 ETCS overlay system between Ealing Broadway, Heathrow Airport Terminals 4 & 5 and West Drayton.

The trains were introduced into passenger service in 2017 but did not begin operations on ETCS fitted lines until 2020. Through the compatibility process required to introduce the class 345 trains, a total of 84 TSI (Technical Specifications of Interoperability) non-conformances were identified on the ETCS system.

The ETCS system had various maintenance upgrades, along with upgrades of the TCMS (Train Control Management System) to support full functionality of the Class 345 and for it to be fully compliant to the TSI and remove the 84 non-conformances.

On 6 May 2020 we granted Authorisation to place into Service for the ETCS enabled class 345s with stipulations to achieve the completion (of the non-conformances) by 31 March 2024.

In the period between authorisation and full integration onto the Network, the Class 345 has been subject to several in service incidents.

Approach to resolution

ORR engaged with MTR requiring them to undertake a root and branch review of software specification and application, in order to demonstrate that the software used on the Class 345 did not give rise to risk.

Consultants were jointly engaged by MTR and RfL as the operator and owner of the Class 345 to

undertake an audit. This resulted in various workstreams to improve software integrity, conducted alongside the work to resolve the TSI non-conformances.

Conclusion

MTR has assessed all current ETCS non-conformances and are satisfied that the current live list either have no significant impact on MTR's operations or are controlled via existing mitigation measures to as low as reasonably practicable and represent a tolerable risk to MTR's operations.

ORR, MTR and Alstom have collaborated well together to agree a timely solution.

Trams and light rail

Our RM3 assessment of the sector indicates safety management system maturity around the managed to standardised range in general. However, as last year, there was evidence that some tramways were operating towards the ad-hoc range in certain areas which occasionally indicated a failure to comply with reasonably practicable standards.

Where this was the case, we took proportionate formal enforcement action. It should be noted that the sector continues to be extremely receptive to continuous improvement, making sure safety management arrangements continue to mature and sharing and collaborating on RM3 assessments and action plans.

The main RM3 elements scored this year included:

- PI1 Risk assessment where in general assessments were at the managed level with some in the ad hoc region
- RCS1 – Safe Systems of Work where we generally found managed to standardised arrangements in place although there was evidence of informal and ad hoc arrangements at a few tramways, and
- MRA1 – Proactive Monitoring Arrangements where all tramways were at least in the managed category of maturity

During the year we concentrated our proactive regulatory inspection interventions on two main areas at all seven modern tramways. The first examined trackworker safety when working on or near the tramway. The second looked at fitness to work procedures relating to the medical fitness

of safety critical staff including tram drivers.

When we inspected track worker safety arrangements we found considerable variability in risk control measures. The main area where improvement was required was around risk assessment. Risk assessments generally ranged from acceptable to poor.

Following our inspections, tramways put in place plans to develop their arrangements in this area. All tramways had reasonable controls in place to manage risks on or near the tramway although some were more effective than others. Trackworker competence management systems were generally professionally managed but not necessarily integrated into the wider safety management system.

Similar variability was found when we tested documented procedures relating to medical fitness to work for safety critical workers. Many tramways had procedures in place to ensure safety critical staff were medically fit to work. However, procedures and documentation could be confusing, with roles and responsibilities not necessarily clearly defined. Our intervention has ensured that all tramways now have appropriate and robust arrangements in place to manage this difficult area.

We have also continued our successful programme of heritage tramway inspection focusing on the same specific RM3 topic areas as the previous year, PI1- risk assessment, OC7 - record keeping and management, and MRA1 and MRA4 - monitoring and management review. We have also attended the UKTram Heritage Tramway Committee, presenting on topics of strategic importance and providing help and guidance where possible.

We strengthen relationships and engage at a strategic level with the Light Rail Safety and Standards Board (LRSSB), including providing help and support where appropriate. We have also entered into a new Memorandum of Understanding with the LRSSB that clarifies roles and sets clear expectations.

We continue to make sure all tramways fully implement the Sandilands RAIB recommendations and have regular and ongoing contact with those tramways who are well advanced in completing work to fit speed control and driver attentiveness systems to their trams. Transport for Greater Manchester, who were subject to two Improvement Notices last year relating to fitting speed control and driver vigilance devices to their trams, continue to make good progress in fitting engineering controls to their fleet.

Using available data sources to identify priorities we are concentrating our inspection work next year on risk assessment and control measures in place at non-motorised user crossings where unfortunately the sector continues to experience fatal and serious accidents to members of the public.

Case Study 3: Track worker safety inspection

During our track worker safety inspections at one particular tramway we found evidence that safe systems of work were informally followed with an over reliance on individuals doing what they felt was best. This was coupled with inspectors observing improvised controls on site leading to potentially unsafe situations arising.

There were several causes for this including inadequate risk assessment of the tasks at hand, lack of instruction and training for some key safety roles, and little evidence of any supervision and monitoring of the work.

We formally required the tramway to develop and implement a robust action plan to address the deficiencies noted within a short period of time. The tramway responded positively to our intervention tackling the issues quickly and effectively and the tramway now has suitable written

procedures and practical controls in place to protect track workers undertaking work on or near the tramway.

Channel Tunnel

The Intergovernmental Commission (IGC) is currently the National Safety Authority (NSA) for the UK half of the Channel Tunnel – the "Fixed Link." The Channel Tunnel Safety Authority (CTSA) is responsible for advising and assisting the IGC on all matters concerning safety in the construction and operation of the Tunnel.

Both the IGC and CTSA are bi-national entities and include representatives from both French and British transport ministries, regulators and emergency services.

We work closely with both Eurotunnel and international operators to ensure that major refurbishment and enhancement projects and the introduction of new rolling stock and infrastructure are managed effectively, and in accordance with relevant legislation.

In March 2024 we jointly established a new forum with L'Etablissement Public de Sécurité Ferroviaire (EPSF) who are the national safety authority for the French half of the Tunnel.

This Safety Monitoring Group, provides detailed scrutiny of technical and operational matters that may affect the safety of railway operations on the Channel Tunnel concession.

Amongst the work undertaken by CTSA inspectors this year, we have:

- undertaken an assessment of Eurotunnel's application for the periodic renewal of its safety authorisation, as well as the renewal of an international freight operator's safety certificate
- inspected the procedures used by the emergency responders, including First Line of Response (FLOR) contractors, when managing incidents in the Channel Tunnel
- examined freight operators' arrangements for pre-departure checks of services using the Channel Tunnel, as well as international train driver competence
- started early engagement with potential new international passenger operators, ensuring that aspirant operators are aware of the specific requirements associated with operations on the Fixed Link

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Case Study 4: International Freight Operations

The Channel Tunnel provides an essential link for the movement of goods between Great Britain and Europe. In 2023-24 we worked with inspectors from EPSF to carry out an inspection of Dollands Moor and Calais Frethun freight yards, focussing on the pre-departure checks undertaken on rail freight services using the Channel Tunnel, as well as the arrangements for the competency of freight train drivers of international freight services.

We examined these arrangements through a combination of interviews with staff, site visits and document reviews. The report concluded that there were appropriate arrangements in place for the management of both pre-departure inspections and the competence of international freight train drivers.

We continue to work with Eurotunnel on multi-year projects, to ensure that risks are identified, assessed and appropriately mitigated. These projects include:

- the mid-life overhaul of Eurotunnel's passenger shuttle fleet
- Eurotunnel's revision of its emergency management arrangements
- Eurotunnel's long-term response to incidents involving a loss of suspension components on freight shuttles- see below for more details

We have also engaged with both Eurotunnel and Eurostar on their preparation for increased passenger numbers and ceremonial events during the Summer 2024 Olympic and Paralympic games.

There were two significant incidents that occurred during 2023 to 2024.

June 2023: A missing suspension spring was discovered on a freight shuttle wagon during routine maintenance. This follows on from a similar incident in August 2022 where a freight shuttle derailed at low speed in the French terminal as a result of the loss of a suspension spring. We have continued to engage with Eurotunnel as it has implemented appropriate contingency measures to permit the continued operation of freight shuttles. Eurotunnel is now examining the interface between the condition of the train and track and whether this has the potential to increase the risk of derailment.

30 November 2023: A London to Amsterdam Eurostar service was involved in an incident where the overhead line failed at the High Speed 1- Eurotunnel infrastructure boundary. The train lost power and it took almost 8 hours to return the train to St Pancras, during which time the train's 770 passengers had to endure an increasingly deteriorating on-board environment. Although the incident did not occur on the Channel Tunnel concession, the incident response involved Eurotunnel resources and any learning from the industry investigation will be directly relevant to the management of stranded trains incidents in the Fixed Link.

We continued to work closely with colleagues in the French Transport Ministry to conclude the arrangements to facilitate the supervision of Channel Tunnel operators following the UK's exit from the European Union. The final appendix of the Cooperation Agreement, appendix VI, relating to the authorisation for placing into service of fixed installations) was signed by ourselves, EPSF and the IGC in December 2023.

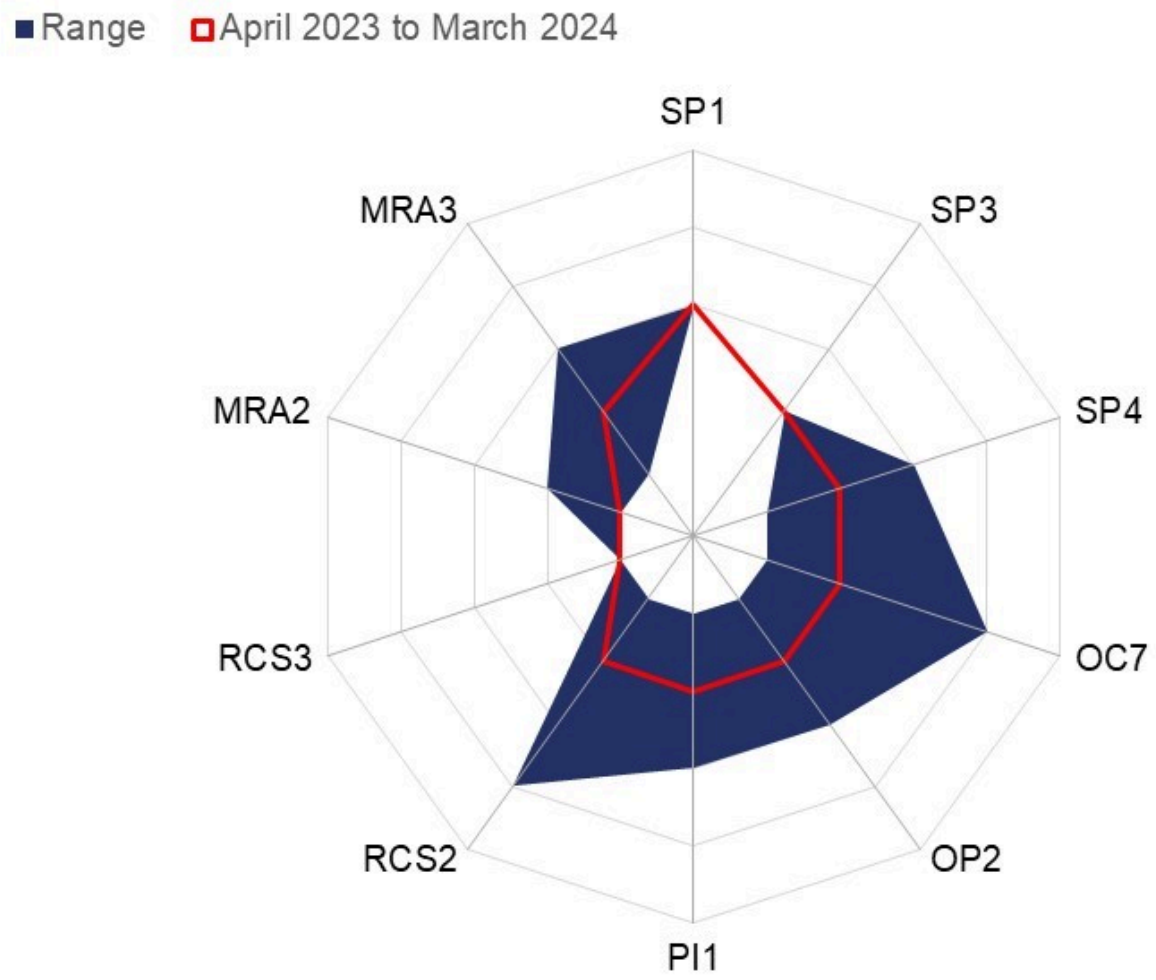
In the coming year we intend to undertake planned inspections of Eurotunnel's management of civil engineering assets and arrangements for the management of drivers of engineering trains, as well as continue to examine the processes for the management of emergencies within the Fixed Link.

Heritage and minor railways

Key messages:

- in 2023 to 2024 we have continued to emphasise the importance of a proportionate safety management system in what are challenging times for the sector, by publishing new guidance in this area. Incidents that we have investigated throughout the year have frequently been linked to a failure by operators to manage change safely.
- our interactions within the sector in 2023 to 2024 included inspections focusing on work at height, and general health and safety inspections of railways. The output of these inspections has assisted us in developing an overall assessment of maturity of the sector's management of health and safety using RM3. This assessment is similar to previous years with the majority of criteria considered to be "managed". One criterion, change management, is less mature than in 2022 to 2023 based on the evidence sampled this year. There remains significant potential for a more standardised approach to be adopted by the sector and we continue to engage with industry groups to achieve this. We remain of the view that a dedicated body to draft and publish guidance and standards for the heritage sector can help deliver this.

Figure 5: Heritage and Minor Railways 2023 to 2024 RM3 Assessment



Source: ORR

Table 2: Heritage and Minor Railways 2023 to 2024 RM3 Assessment

Code	Description	2023 to 2024 Assessed Level	Min	Max
SP1	Leadership	3	3	3
SP3	Board Governance	2	2	2

Code	Description	2023 to 2024 Assessed Level	Min	Max
SP4	Written Safety Management System	2	1	3
OC7	Record Keeping, Document Control and Knowledge Management	2	1	4
OP2	Competence Management System	2	1	3
PI1	Risk Assessment and Management	2	1	3
RCS2	Management of Assets	2	1	4
RCS3	Change Management	1	1	1
MRA2	Audit	1	1	2
MRA3	Incident Investigation	2	1	3

Source: ORR

In August 2023 we published new sector specific guidance on safety management systems. We

strongly believe a systematic approach to health and safety management can ensure that operators meet relevant legislative requirements and operate in a safe manner. We have reinforced this through a series of industry workshops (see case study below).

In 2023 to 2024 we served three Improvement Notices on heritage and minor railways. Two of those notices were served following a failure by the railway to safely manage a change to their operations, highlighting the importance of identifying changes and ensuring any impacts on safety are assessed and managed. The other notice related to the management of operational staff competence.

Our investigation into a fall from height at the Gwili Railway Company Ltd. in 2022 concluded this year with a decision to prosecute the railway. The railway pleaded guilty and was subsequently fined £18,000 in September 2023.

Analysis of incidents reported to us indicates that the number of derailment incidents increased during 2023 to 2024 (12 in total). The majority of these incidents (10) occurred at narrow gauge railways and arose for a variety of reasons including the track asset, the vehicle and the actions of operational workers.

Fortunately, the majority of these incidents occurred at low speed and did not result in any injuries, however the increase is concerning and in different circumstances these incidents could result in harm.

In 2024 to 2025, we plan to undertake inspection activity in the specific areas of work at height, asbestos management, and on-track plant, as well as undertaking some general inspections of a sample of railways. We will also continue to engage railways through face-to-face workshops to drive improvements in safety management system capability across the heritage sector.

Case Study 5: New Safety Management System Guidance for the Heritage and Minor Railway Sector

In August 2023, ORR published new guidance for heritage and minor railways. This document was developed as we have consistently found weaknesses in the safety management systems of these railways and have served several improvement notices in recent years related to this.

The document provides a summary of requirements within the Railway and Guided Transport Systems (Safety) Regulations 2006 (ROGS) for safety management systems and how duty holders may apply these requirements to their own railway. The document recognises the diversity of operators that exists within the sector and recommends a proportionate approach.

We ran a series of face-to-face workshops in collaboration with the Heritage Railway Association (HRA) in January and February 2024 to promote the new guidance at locations across Great Britain. Representatives from 82 railways and tramways attended these workshops.

"The SMS workshops run by ORR provided an open, honest and collaborative environment for railways to learn how to improve safety management."

Andrew Barnes, Managing Director, Bure Valley Railway

Case study 6: Work at Height Inspections

In 2022 and 2023 there were several incidents at heritage railways whereby a volunteer, contractor or member of staff was seriously injured as a result of a fall from height. In response to this adverse trend, ORR undertook specific and targeted inspections on the management of work from height at nine heritage railways in 2023 to 2024.

Our inspections found some common areas of weakness. Risk assessment was the most prominent area of weakness with often a failure to consider all the tasks undertaken at height and identify appropriate control measures. Many control measures identified in risk assessments were often only briefly described and open to interpretation. Some railways failed to ensure work at height equipment was maintained in a suitable condition. Fundamentally there was often limited monitoring and audit associated with work at height practices meaning operators had not identified their own weaknesses.

However, we saw several examples of good practice, for example:

- various measures to reduce the risk associated with emptying locomotive smokeboxes ranging from bespoke working platforms to undertake the task safely to self-cleaning fireboxes to reduce the frequency at which the task is undertaken.
- adaptation and redesign of watering equipment both on and off the locomotive to minimise working at height, for example low-level water filling of tenders
- secure Ladder guards on work at height equipment in publicly accessible areas e.g. signal post ladders on station platforms.
- bespoke guarding on carriage doors undergoing maintenance and restoration to prevent falls from height in a workshop environment.
- comprehensive asset registers for work at height equipment.

In summary, our inspection findings indicate that the sector is not always meeting minimum legal requirements when undertaking work at height and there is scope for the sector to improve. Operators should start with ensuring a suitable and sufficient risk assessment is in place appropriate for the work being undertaken. Railways then need to ensure that the measures identified through risk assessment are implemented and ensure that there are appropriate measures in place to check that these measures are effective.

Our health and safety policy, strategy and statutory work

In the year to March 2024, we continued to develop, improve and promote the regulatory framework for railway health and safety and to improve our supporting processes. We also delivered a range of statutory work through health and safety permissions and approvals. We continued this year to invest heavily in the future by recruiting three cohorts of trainee inspectors and inspector assistants and strengthening our continuous professional development of qualified staff.

Improving legislation, guidance and processes for train driving licences

The Train Driving Licences and Certificates Regulations 2010 (TDLCR) transposed a European Directive that created an EU wide system of train driver licensing and certification based on common requirements.

The original objectives of TDLCR were to make it easier for cross-border rail services to operate; to create a more flexible job market for train drivers; to introduce consistent standards for train drivers across Europe; and to increase public confidence in the rail system through the requirement for certain groups of train drivers to hold a licence. There are currently around 23,000 licensed train drivers in Great Britain.

TDLCR are subject to a post implementation review (PIR) every 5 years to assess whether the regulations remain fit for purpose and are achieving their original objectives. Last year, we carried forward recommendations from the latest post implementation review of TDLCR which was reported in May 2023 and evidenced a case for change. Working closely with the Department for Transport, we have explored options for improving the efficiency of the licensing regime with a focus on reducing the prescription in legislation and increasing the flexibility to allow the continuous improvement and updating of requirements e.g. for medical fitness and driver training.

This has involved close working with stakeholders to explore the options for reform, with a view to utilising the opportunities to change the law afforded by the Retained EU Law (Revocation and

Reform) Act 2023. The first output from this work is a consultation on lowering the minimum age for drivers (May 2024). Our work on options for further reform will feed into a second round of consultation later in 2024/25.

We also published revised guidance on making an appeal to ORR against a decision by an operator concerning a train driving certificate. We collaborated with DfT to ensure they published their revised guidance on appeals against decisions made by ORR concerning train driving licences at the same time. Both documents reflect lessons learned from ten years' experience of operating the train driving licensing regime.

Case study 7: New Train Driving Licences Portal

Through excellent collaboration with train operators and our external contractors, we moved closer to full roll out of our new, improved web-based portal to support the efficient processing of new train driving licences, renewals, and updates to licence details.

We listened to operators' views about improving functionality and reducing unnecessary administrative burdens when we designed the new portal and - whilst it has taken longer than expected to build, test and re-test - we have been able to roll it out to the vast majority of operators for them to start using.

Representatives from the train and freight operating companies engaged fully with helping us test the system and then during the training sessions we provided. After his session and receiving access to it, Richard Farish, Operations Standards Manager at LNER, commented:

"Suffice to say, my Christmases have come early.... regaining access to [a portal] in its new fresh, format makes life so much easier for us."

Other policy developments and improvements

EU-derived law and regulation

At the start of the year, we devoted significant time and resource to working with DfT and the Health and Safety Executive (HSE) to understand and prepare to implement the requirements of

the Retained EU Law (Revocation and Reform) Bill as it progressed through the parliamentary stages (it became an Act in June 2023). We worked hard to clarify potential impacts on rail health and safety legislation to ensure there were no unintended consequences to health and safety legislation. Whilst the original scope of reform was scaled back, we still looked to utilise the genuine opportunities afforded by the Act to work with stakeholders to see where improvements to legislation might be helpful, including revoking some redundant legislation.

We worked closely with DfT to make legislative change and update Guidance for Entities in Charge of Maintenance in Great Britain to reflect the fact that EU-issued certificates for entities in charge of maintenance (ECM) would no longer be recognised for domestic-use freight wagons from 30 June 2023. The updated guidance also clarified when a rail journey is treated as an international journey.

The Intergovernmental Commission (IGC) is the current National Safety Authority (NSA) for the UK half of the Channel Tunnel – the "Channel Fixed Link." The IGC was previously the NSA for the whole of the Channel Fixed Link. However, since 1 January 2021, and following the UK's withdrawal from the European Union (EU), L'Etablissement Public de Sécurité Ferroviaire (EPSF), the French safety regulator, has been the NSA for the French half of the Channel Fixed Link. We are supporting the Department for Transport (DfT) and their French Ministry counterparts to develop new bi-national legislation for the Channel Tunnel that will reflect the regulatory environment following the UK's withdrawal from the EU. Once that new legislation comes into force (currently anticipated in 2025), the NSA responsibilities for the UK half of the Channel Fixed Link will transfer from the IGC to ORR.

Improving our guidance

We consulted on draft guidance which explained the application of The Railway Safety Regulations 1999 (RSR99) to train protection systems. The guidance aimed to provide clarity on the interpretation of RSR99 in relation to train protection systems, including how we expect duty holders to manage the migration towards automatic train protection systems, and how other legal requirements relevant to train protection systems apply. The intention was to support innovation and safety improvement by making the regulatory requirements more explicit and easier to understand. Engagement with stakeholders was positive, with helpful feedback provided, enabling us to publish the guidance in May 2024.

We also consulted on draft guidance which reviewed and updated our existing guidance on

Managing Rail Staff Fatigue. The guidance aims to set out a management systems approach and to bring clarity to the legal requirements and expectations around managing the risks arising from fatigue. This guidance is scheduled to be published in summer 2024.

Asbestos-related exemption

We conducted a stakeholder survey to help determine whether we should issue a further exemption certificate to authorise the placing onto the market of railway vehicles, and components for use in railway vehicles, which contain asbestos and which were in service or installed before 1 January 2005. In December 2023, we issued our third general exemption certificate – with detailed conditions to meet - which allows the controlled sale, lease or loan of second-hand railway vehicles and components which contain asbestos. The exemption covers all railway systems for which we are normally the enforcing authority and, as with the previous exemptions issued in 2014 and 2019, we will continue to monitor compliance with it.

Reviewing our frameworks and processes

We carried out some work to research and review the relationship between health and safety requirements and our interoperability authorisations for railway infrastructure and vehicles. This looked at the legal framework for interoperability and the roles of ORR and other parties in various assurance processes, including the application of relevant standards. We are using this work to inform further thinking on whether there is scope for improvements. On standards related work we supported RSSB and DfT on the review of National Technical Specification Notices (NTSNs) and will continue to provide advice as this progresses. We also reviewed proposals for updating RSSB's Railway Standards Code and gave our approval to the new code which was published in January 2024.

We improved our internal processes through the development of a new inspection report template, a new manual and suite of forms for ROGS assessment and a new approach to our Strategic Risk Chapters. RSD colleagues have also been heavily involved in the development and implementation of a new ORR wide case management system.

We have recently initiated a programme of work to review how the costs and benefits of safety interventions are assessed by Network Rail and train operators. We want to understand how and when cost estimates are compiled for safety initiatives, as part of robust project development and management arrangements, and whether reasonable practicability is systematically tested. Our intention is that by working closely with stakeholders we can establish learning points for the rail

industry to deliver best practice in assessing the costs and benefits of safety related decision making.

Working with other regulators, safety authorities, and industry bodies to share best practice and aid continuous improvement

Our international engagement

At the beginning of the year, we revised our approach to international related engagement to reflect the post-Brexit and post-Covid environment as well as the related priorities of wider Government departments. This allows us to prioritise engagement and maximise the benefits for both ORR and the wider GB rail industry. Throughout the year we continued to receive requests for engagement from a wide range of international stakeholders, with an increasing amount of these coming via DfT and the Department for Business and Trade (DBT), both of whom have dedicated international rail teams. We provided input and support to several inward delegations hosted by DfT and DBT, where our role and knowledge sharing as the independent health and safety regulator was invaluable.

We rejoined the National Safety Authority (NSA) Network with observer status after being invited back by the European Union Agency for Railways (ERA) late last year. During the past year we attended NSA Network related meetings and participated in various subgroups and forums, allowing us to stay informed about developments at the EU level. This is particularly important for how we regulate the Channel Tunnel and also represents important learning for domestic railway legislation, policies, and approaches.

We maintained strong relationships with other railway safety authorities and undertook bilateral engagement with several counterparts to share learning and best practices. We continued to work closely with our European counterparts via the International Liaison Group of Government Railway Inspectorates (ILGGRI), which we provide the secretariat for. The forum continues to be a valuable space for sharing knowledge, learning and best practice on a wide range of health and safety topics.

Our external health and safety committee

We chaired three meetings of the Railway Industry Health and Safety Advisory Committee (RIHSAC), which brings together representatives of employers, employees, passengers, and government bodies to offer advice and challenge to ORR's Board on health and safety matters. The range of topics discussed included the annual health and safety reports published by ORR, RSSB and RAIB; an update on ORR's work on safety by design; an overview of Rail Partners' work on depot safety and the depot conference; a review of the Rail Wellbeing Alliance (RWA) and ORR's health priorities; mental health risk management / including prevention (for both industry and passengers); RSSB's tools on health and mental health risk management; and tram safety – update on developments since the Sandilands incident.

Our engagement and collaboration with other regulators

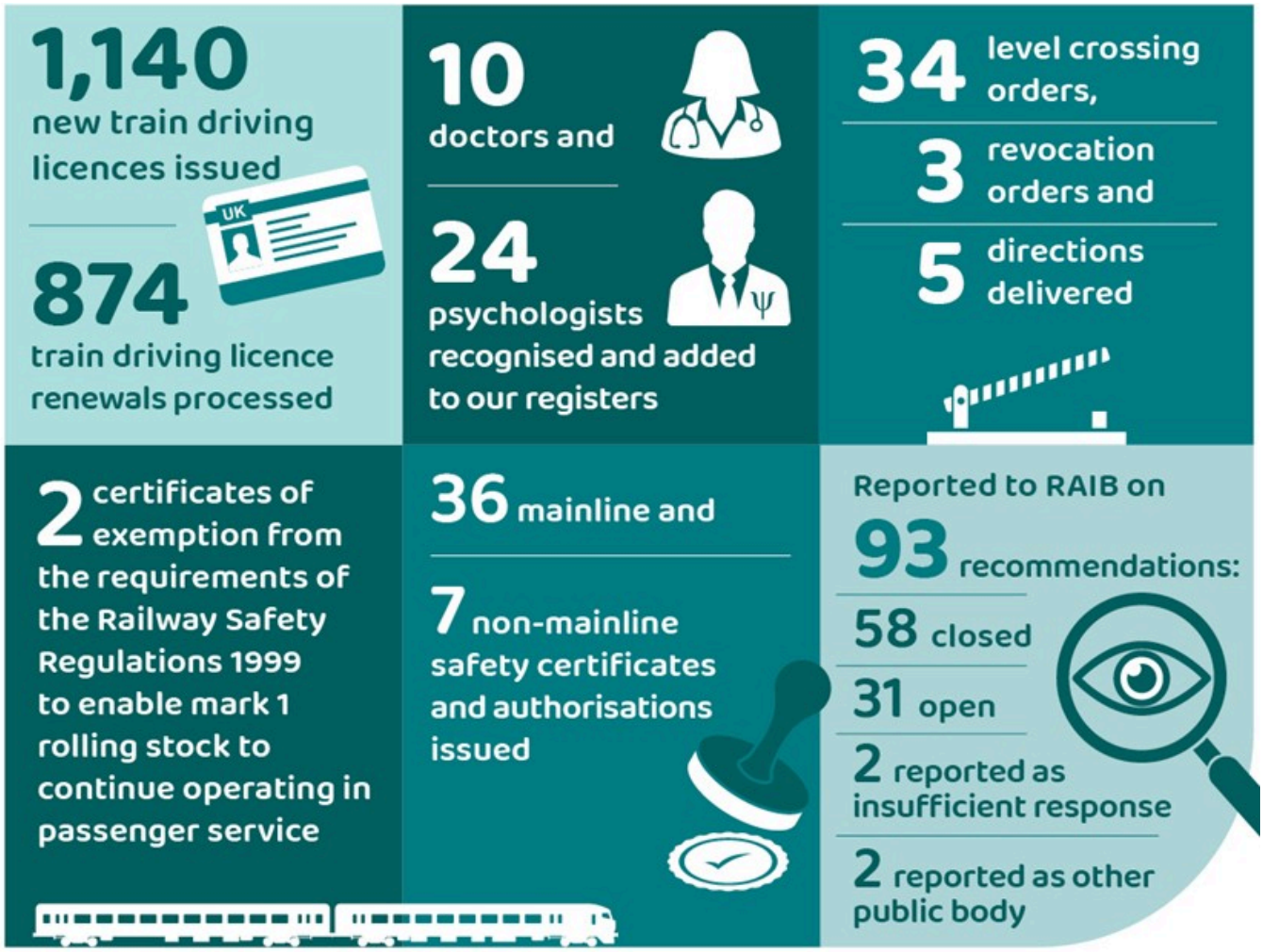
We maintained a regular dialogue with HSE colleagues as co-regulators and reviewed and produced reports on how the inter-agency agreements between us (covering safety by design and road vehicle incursion related activity and enforcement) were working. We concludedthat both agreements remained appropriate as drafted and were working as intended to support our regulatory work.

We remained an active participant in the UK Health and Safety Regulators' Network (UKHSRN) (a group of senior health, safety and environmental regulators that share information and best practice) and its Innovation Subgroup set up to support the government's growth and net zero strategic objectives. We chaired the UKHSRN Innovation Subgroup quarterly meetings with expert guest speakers and hosted two workshops on approaches to regulating innovation and regulating artificial intelligence.

Delivering a range of statutory work

We grant a range of health and safety permissions and approvals, and in some cases, we have statutory deadlines to meet for processing requests and issuing our decisions. This work is important because it helps provide an effective framework for railway safety.

This infographic shows the range of work we undertook in 2023 to 2024.



Our enforcement activities

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.

On some occasions however, we use our formal powers under the Health and Safety at Work etc Act 1974 (HSWA) to ensure compliance with the law or to deal with immediate risk. We use enforcement notices to stop an activity involving serious risk, or to rectify serious gaps in duty holders' risk control. If required, we will hold duty holders to account through prosecution in the criminal courts. Our Enforcement Policy Statement sets out how we ensure rigour and consistency in our enforcement decisions by using ORR's Enforcement Management Model (EMM)

During the year we issued one prohibition notice and seven improvement notices and, where appropriate, prosecuted duty holders in the courts to ensure compliance with the law. As

prevention is always better than addressing issues after an incident has occurred, the Prohibition Notices stopped activities that posed a risk of serious personal injury and the Improvement Notices identified serious breaches of the law that required changes to be made.

The prohibition notice was against West Coast Railway Company Limited, relating to the health and safety of their passengers and crew, as they had not implemented controls identified in their risk assessment for rolling stock fitted with secondary door locking systems.

An Improvement Notice was served to Network Rail Infrastructure following overcrowding issues at London Euston Station. The notice required a risk assessment for management of passenger flow and overcrowding. To address the terms of the Notice, Network Rail conducted a risk assessment to identify what control measures were required and put these into place. This will enable them to work in collaboration with the train operators to ensure they manage passenger flows sufficiently in practice.

Prosecutions

We undertook a number of Health and Safety prosecutions in the courts:

April 2023: Amey Rail Limited (ARL) was fined £533,334 following an electric shock injury to an overhead line engineer as they carried out works to overhead lines outside Paddington Station in London. ARL pleaded guilty to an offence under the Health and Safety at Work etc. Act 1974.

May 2023: Linbrooke Services Ltd were found guilty after an electrician installing public address system equipment at Bearsden station, West Dunbartonshire, in June 2018 fell from a stepladder onto a section of improvised work equipment sustaining a fatal injury. Linbrooke was found guilty of three offences under the Management of Health and Safety Regulations 1999 and the Work at Height Regulations 2005 at Dumbarton Sheriff Court. The court handed out a penalty of £600,000, comprising a fine of £400,000 and a compensation order of £200,000.

July 2023: Transport for London (TfL) and Tram Operations Limited (TOL) were sentenced at the Old Bailey for health and safety failings that caused the 2016 Croydon tram crash, when seven passengers died and 51 were injured. TfL was fined £10m and TOL £4m after pleading guilty to offences under the Health and Safety at Work etc. Act 1974.

August 2023: Edinburgh Trams Limited was fined £240,000 after pleading guilty to one offence under the Health and Safety at Work etc Act 1974, after a pedestrian was struck and killed by a

tram in September 2018 at Saughton Mains footpath crossing on the Edinburgh tramway.

September 2023: The heritage-train operator Gwili Railway Company Ltd was fined £18,000 after pleading guilty to one offence under the Work at Height Regulations 2005, after a volunteer was injured in a fall in 2022 at the company's Llwyfan Cerrig Yard.

September 2023: Network Rail was fined £6.7m for health and safety failings that led to the train derailment at Carmont in Scotland in 2020, when three people died and a further six were injured. This followed an ORR, Police Scotland and British Transport Police joint investigation under the direction of the Crown Office and Procurator Fiscal Service. Network Rail Infrastructure Limited pleaded guilty to a charge contrary to Sections 3(1) and Section 33(1)(a) of the Health and Safety at Work etc. Act 1974.