

# Annual Report of Health and Safety on Britain's Railways

13 July 2021



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## Chief Inspector's Review

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This last year has been one of the most difficult for the railway in 20 years, if not since the Second World War. Passenger numbers dropped significantly and varied enormously during the different phases of the coronavirus (COVID-19) pandemic. Timetables changed frequently and social distancing measures, face coverings, and enhanced cleaning were introduced quickly.

The pandemic created huge challenges, including sharp declines in revenue, changes to working practices to keep workers and passengers safe, and a need to be more responsive to changing use. We sadly lost members of the rail community to COVID-19 and all my thoughts remain with their families and friends.



### Independent oversight

I would like to place on record my thanks to every member of the railway family, and to those at the Office of Rail and Road for their hard work and dedication over the last year. We've continued to regulate and provide independent oversight and assurance to the industry in what has been a challenging year.

We saw most recently how important our health and safety expertise is when a number of Hitachi Class 80x and 385 series trains were removed from service as a precaution when cracks were found on some trains. We provided the oversight that was needed to make sure rigorous safety checks were carried out and we have continued to engage with Hitachi and train companies, as well as making sure the industry can learn lessons from this.

### Responding to the pandemic

Rightly, this last year has seen the attention of the whole industry on managing the impact of COVID-19 on staff, passengers and finances and industry has shown how well it can work in a highly collaborative way. For example, we have seen a sound and robust response to COVID-19 from Transport for London (TFL), and it has been clear TFL recognises the importance of safety as they consider their response to the evolving financial pressures created by reduced fare income. In response we are working with TFL as we commence a new programme of work assessing their asset management capability.

The heritage rail sector is another good example. COVID-19 seriously impacted the sector, causing all operations to cease during the most severe lockdown periods. Working with the Heritage Railway Association, we supported the sector in preparing for re-opening, and encouraged operators to use non-passenger operating periods to build capability and resilience. Many operations did this and they also reacted positively to the targeted version of our Risk Management Maturity Model (RM3 2019 Topic Set 1) tailored for the heritage railway environment, particularly the new information supporting the role of leadership and governance. You can read more about our work further in this report.

## A mixed picture for health and safety

We have seen a mixed picture for health and safety performance with some disappointing and tragic events that shook the railway world over the last year. While we have one of the safest railways in Europe, there have been further lineside workforce fatalities and three people tragically lost their lives when a train derailed at Carmont, near Stonehaven in what was the worst rail crash since 2007 at Grayrigg.

Our joint investigation with Police Scotland and the British Transport Police into Carmont continues. This incident is a stark reminder for the industry, in particular Network Rail, to ensure its operations and asset management minimise safety risks and mitigate the impact of climate change on our railways, as I warned in my 2019-20 report last year.

Although asset performance has been good, we remain concerned, as highlighted in this report, that there is a lack of progress examining structures and Network Rail needs to increase its knowledge of its drainage assets, whilst noting that the slow roll out of technology across assets is frustrating.

The year also saw significant failures of a number of structures, including viaducts at Nine Elms and Carron Water. These incidents illustrate the importance of carrying out high quality evaluations of structures examinations so that risks can be identified, and appropriate mitigations implemented.

With more frequent severe weather events impacting the management of an ageing infrastructure, particularly earthworks and drainage systems, it is imperative that weather resilience plans continue to be enhanced. It will remain important to be able to identify the conditions of assets quickly if they are more likely to fail. Achieving this requires strengthened arrangements and improved monitoring and preventative action by Network Rail.

We detail in this report and in our annual assessment of Network Rail how the company is responding to these challenges, and how we will monitor its response and activities through inspection this year. It will remain a key area for our regulatory activity, I suspect for years to come, including the work we will do in the next Periodic Review 2023 (PR23).

In the year 2020/21, we have also seen the number of fatalities at level crossings increase as well as the number of trespass incidents on our railways at various points throughout the pandemic. Although trespass has reduced significantly, we have seen a sharp increase in various months – particularly November when there were 21% more incidents than the previous year. Our new ['Principles for managing level crossing safety'](#) guidance has recently been published and has been welcomed by industry to help support the management of risks at level crossings. Our guidance supports a risk-based approach to help establish reasonably practicable solutions, while taking into account cost when considering safety measures. It does not specify requirements or solutions, allowing a proportionate, case-by-case approach to be made by duty holders.

Management of risk at the Platform Train Interface (PTI) remains a priority for us. We sadly continue to see incidents occur which has led to us issuing four improvement notices relating to PTI this year. There has been some very good proactive work done by duty holders and Rail Safety and Standards Board (RSSB) but I particularly want to see greater collaboration between designers, manufacturers and operators to bring into service trains that have been designed to reduce risk to passengers to a minimum and improvements for disabled passengers, which I outline in my three main challenges below.

The freight sector has continued its work to address key health and safety risks through the National Freight Safety Group (NFSG). The NFSG brings together representatives from the freight operating companies and Network Rail in order to identify risk control measures that will lead to sector-

wide continuous improvement in health and safety. The NFSG is a good example of how competing duty holders can work together to improve, whilst at the same time maintain both their individual responsibilities to manage risk under health and safety legislation, together with the advantages of a competitive market.

We are still working with other agencies to understand the cause for the derailment of a freight train conveying petroleum products at Llangennech, south-west Wales on 26 August 2020. This derailment highlights the catastrophic consequences, with the subsequent fire and environmental pollution, that can result from incidents involving freight services.

I am pleased to note the conclusion of the work of the Cross Industry Freight Derailment Working Group, which has resulted in the identification of a set of control measures to reduce the potential causes of freight train derailment, together with a defined action plan for their implementation. However, this is an area where duty holders cannot afford to be complacent. It is therefore important that freight duty holders continue to ensure that they have suitably robust arrangements in place to ensure that the risks arising from derailment and other operational incidents are properly controlled. The NFSG's "Condition of Freight Vehicles on the Network" workstream should assist the freight sector in identifying the most effective risk controls and facilitate the sharing of best practice around rolling stock maintenance and train preparation.

The Light Rail Safety and Standards Board (LRSSB) also continues to establish itself as an important body providing support and guidance to the sector. It is now producing significant pieces of guidance to enable tramways to develop their management of risk, including important guidance on driver attentiveness and speed control.

Following the commemoration of the 20th anniversary of the Ladbroke Grove Rail Incident in 1999, ORR has commissioned Pam Warren to undertake a review to allow some reflection on the progress made and lessons learnt by industry since the incident from a different perspective. Pam Warren is a survivor of Ladbroke Grove and a long-time campaigner for lessons to be learned from the incident. We will be publishing a report from the review later on this year.



## Challenges ahead

I consider we have three main challenges ahead:

- The first includes rebuilding passenger numbers through an enhanced experience. To do this we need to maintain the safety and punctuality performance we have seen this past year and minimise disruption to help build confidence back in the railways. We will need to have excellent management of the risk at the platform train interface and station passenger flows to help facilitate social distancing if it remains for the foreseeable future. Train Operators will also need to keep up the excellent work they have done cleaning trains and stations. Improvements for disabled passengers will come, such as the increased use of tactile paving across the network, with the Department for Transport (DfT) looking to accelerate plans to do so, and ensure the maintenance of and consistency of yellow lines on platforms.
- The second challenge is track worker and depot worker safety. I am pleased we have seen an almost 40% reduction in near misses over the last 12 months between workers and trains, but as I've already mentioned we've seen an increase in workforce fatalities this year which is why we need to improve the safety culture in frontline teams and tackle head on some of the entrenched resistance to change that has bedevilled previous attempts to tackle these issues. We will continue to support the delivery of Network Rail's task force to close out track worker safety improvement notices, in which it has made progress on first line assurance and with Southern Region the furthest advanced. We will be seeking improvements to depot safety and monitoring the effectiveness of the Rail Delivery Group (RDG) depot safety sub group of Passenger Operators Safety Group. The industry needs to deliver on improved health management, including mental health across the sector.
- The third challenge I see is the need to manage an ageing infrastructure especially in severe weather events. I have already detailed earlier in this foreword why this is an issue, but it is clear we now need to manage drainage as a critical asset and make the best use of new technology in predicting weather events. Alongside strong operational readiness and control and strategic management of earthworks and vegetation this will help minimise disruption and lower safety risks so must be a priority going forward. Post COVID-19 and financial issues on the industry will make this more of a challenge.

In addition, in recent years, my annual health and safety report has focused on a number of main themes for the industry, and these are relevant today to tackle these challenges.

**Managing for the future:** Our vision remains "zero industry caused fatalities", with a culture and diversity in the industry that is well advanced from where we were a few years ago. It is imperative to demonstrate strong visible leadership, particularly at the coal face, which will be key to seeing the reforms of the railways through. But we must focus on managing for the future better and we will continue to promote health and safety by design as a key element of building back better, whilst ensuring there is no gold plating. Doing so will help to manage the key challenge climate change is having on our ageing infrastructure with new and better ways to manage these risks going forward.

**Supporting people:** The events over the last year have made it more important that we manage the recovery and restart on supporting people. Good progress has been made, especially in tackling the mental health taboo, with the inaugural Rail Wellbeing Live a success and we have also seen new campaigns launched by Network Rail in partnership with Chasing the Stigma. The industry's longstanding partnership with Samaritans continued to provide new skills for people across the

railways. This work has helped the industry make significant strides in preventing suicides on the network and over the last year I have heard some incredible stories from people in the industry supporting the Million Hour Challenge and Samaritans. Yet, there is always more we can do to support our people, especially track and depot workers, to see through the change in working practices to further reduce near misses with the workforce. These initiatives can help with that and help give staff confidence as we welcome back passengers but it is critical that the industry improves its frontline assurance by management to support and improve the culture at the frontline.

**Technology:** The Network Rail Task Forces on earthworks and weather management is a good example of how technology could lead to a step change, not just in risk reduction but customer experience and could help bring further efficiencies to the rail network. This will both help support our people better as well as help manage the ageing infrastructure, which I highlighted as a challenge. However, we do need to remember the importance of human factors and quality risk assessment so that the human interface is well managed.

It seems inevitable that the next year will be a period of significant challenge and change as the industry engages with these issues while we emerge further from the pandemic and begin to recover.

We recently saw publication of government's rail reform White Paper – [the Williams-Shapps Plan for Rail](#) – which proposes the biggest change to the railways in 25 years. The UK government has set out a clear direction for the future of the rail industry and its reforms will bring rail infrastructure and train operations together under a new body, Great British Railways (GBR).

Safety and industry standards will continue to be set independently and applied across Great Britain. We will bring our expertise in oversight and assurance to this new set-up and our oversight already supports the direction of rail reform in many ways.

We will continue to work closely with industry and government to provide valuable support and advice to help see continuous improvements in health and safety management across the industry so that it benefits everyone.



**Ian Prosser CBE**

Director of Railway Safety, ORR  
HM Chief Inspector of Railways

# Section 1 – Health and safety across the railway sector: The regulator's view

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## Introduction

- 1.1 In this section we provide an overview of our main findings across key risk areas. We go on to set out the evidence supporting our conclusions about risk management effectiveness for each sector, including (where appropriate) the results of our Risk Management Maturity Model (RM3) assessments.
- 1.2 RM3 is one of our key health and safety assessment tools. It measures an organisation's ability to manage risk maturely and achieve excellence in risk control. It looks at the areas of policy, monitoring, audit and review, planning and implementing, securing co-operation and confidence and organising for control and communication. It uses a five-level scale to assess performance and identify areas for improvement:
  - **level 1 'ad-hoc':** processes that are typically undocumented and in a state of dynamic change, tending to be driven in an ad-hoc, uncontrolled and reactive manner by users or events. This provides a chaotic or unstable environment for the processes.
  - **level 2 'managed':** some processes are repeatable, possibly with consistent results. Process discipline is unlikely to be rigorous but where it exists it may help to ensure that existing processes are maintained during times of stress.
  - **level 3 'standardised':** there are sets of defined and documented standard processes established and subject to some degree of improvement over time. These standard processes are in place (i.e. they are 'as-is' processes which define the current state of the business process in an organisation) and are used to establish consistency of process performance across the organisation.
  - **level 4 'predictable':** using process metrics, management can effectively control the as-is process. In particular, management can identify ways to adjust and adapt the process to particular projects without measurable losses of quality or deviations from specifications. Process capability is established from this level.
  - **level 5 'excellence':** a focus on continual improvement of process performance through both innovative and incremental technological changes/improvements.



## How we assess harm and risk performance

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

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

1.4 We use 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 index (FWI).
- **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.

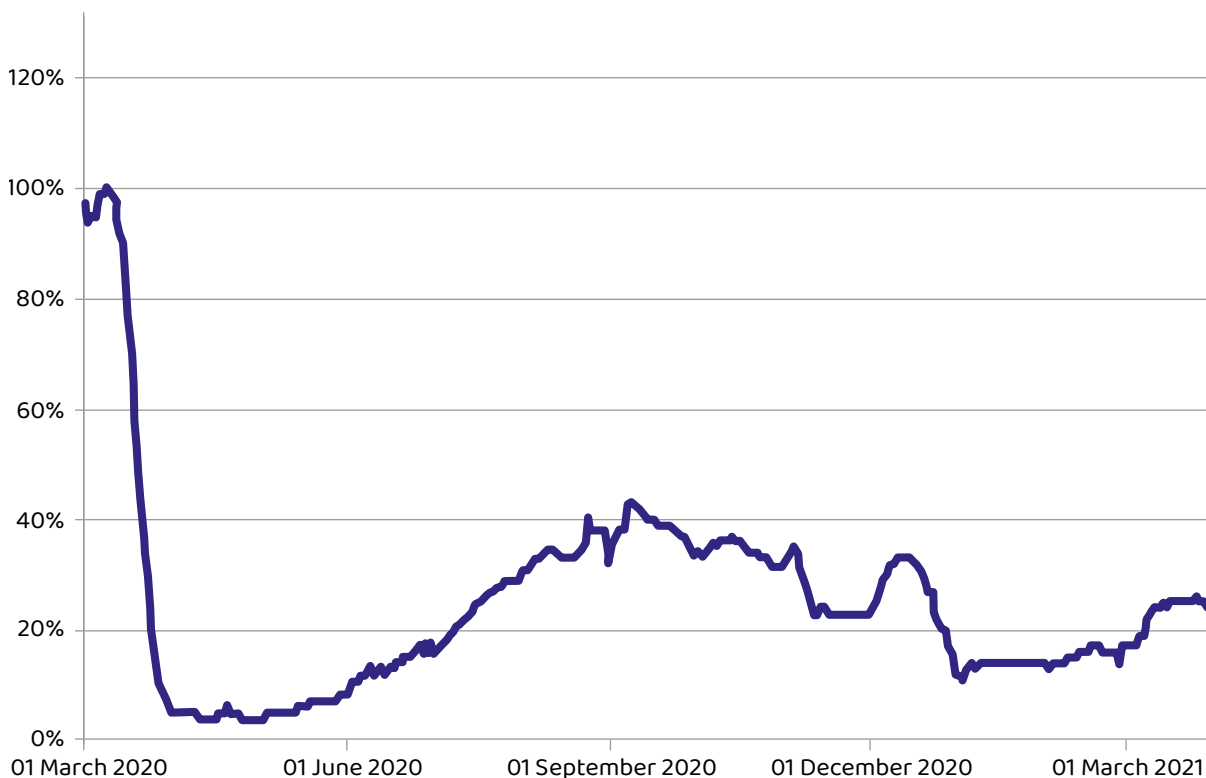


1.5 However, these measures rely on, and are limited by, being outcome-based incident indicators: they measure harm-causing incidents to quantify current catastrophic train accident risk trends, but are not necessarily useful as future predictive or underlying risk indicators. We overcome this through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

- **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.

1.6 When analysing harm over time, it is important to consider the annual trends of passenger numbers and freight moved. Overall, passenger journeys on Britain's mainline railway network in 2020/21 declined to just 22% of the total journeys seen in 2019-20. Freight moved fell by 8.6% to 15.2 billion net tonne kilometres, the lowest level since the mid-90s.

**Figure 1 - Percentage of passenger journeys for the equivalent week in the previous year**



Source: Department for Transport

Percentage of the equivalent week in the previous year up to w/c 8 Feb 2021; from w/c 15 Feb 2021 this reverted to the percentage of the equivalent week in 2019.

## Key safety performance data 2020/21

- 1.7 This report uses final and some provisional railway data from within ORR and from a range of other sources. Confirmed 2020/21 safety data will be issued in our key safety statistics release in September 2021. It will contain finalised numbers from both mainline and non-mainline sectors.

### Changes to the way harm is calculated

- 1.8 On 21 January 2021, RSSB updated the way it measures harm for the mainline railway. Passenger and public injury categories were updated to closer align with those in the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). This resulted in all non-fatal passenger and public injuries being assigned to a single category rather than split between major and minor injuries.
- 1.9 Weightings for the Fatalities and Weighted Injuries (FWI) measure were also amended. RSSB published [Evaluating Safety Performance and Risk: Fatalities Weighted Injuries \(rssb.co.uk\)](https://www.rssb.co.uk/evaluating-safety-performance-and-risk-fatalities-weighted-injuries), which provides further information on the reasons behind these changes.
- 1.10 In order to ensure consistency, we updated our methodology to mirror that of RSSB. These changes have been applied across all sectors and have been backdated to enable comparability of the harm profile over time.

- 1.11 Our FWI classifications and weightings are:

#### Workforce

1 fatal = 1

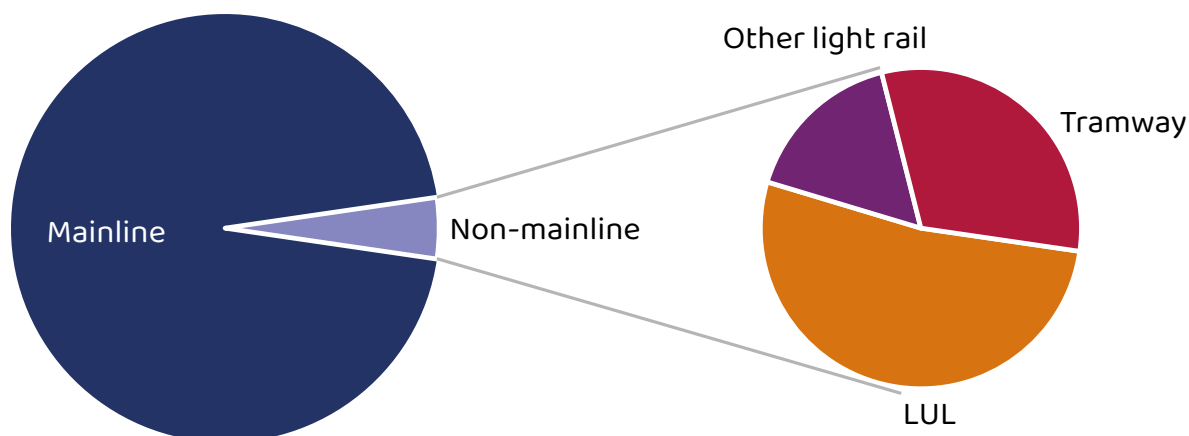
- 1 specified injury = 0.125
- 1 over 7-day injury = 0.1

#### Passengers and Public

- 1 fatal = 1
- 1 severe injury (direct to hospital) = 0.025

- 1.12 FWI and other figures within this report may differ from those produced by other industry bodies. This is because our figures are based on RIDDOR reportable injuries only, whereas other FWI figures may include non-reportable injuries as well as shock and trauma incidents.
- 1.13 Furthermore, our FWI figures are not normalised so do not take into account changes in behaviour, for example, increased work hours or fewer passenger journeys.

Figure 2 – the proportion of track-kilometres in Great Britain broken down by sector



Source: ORR/Department for Transport

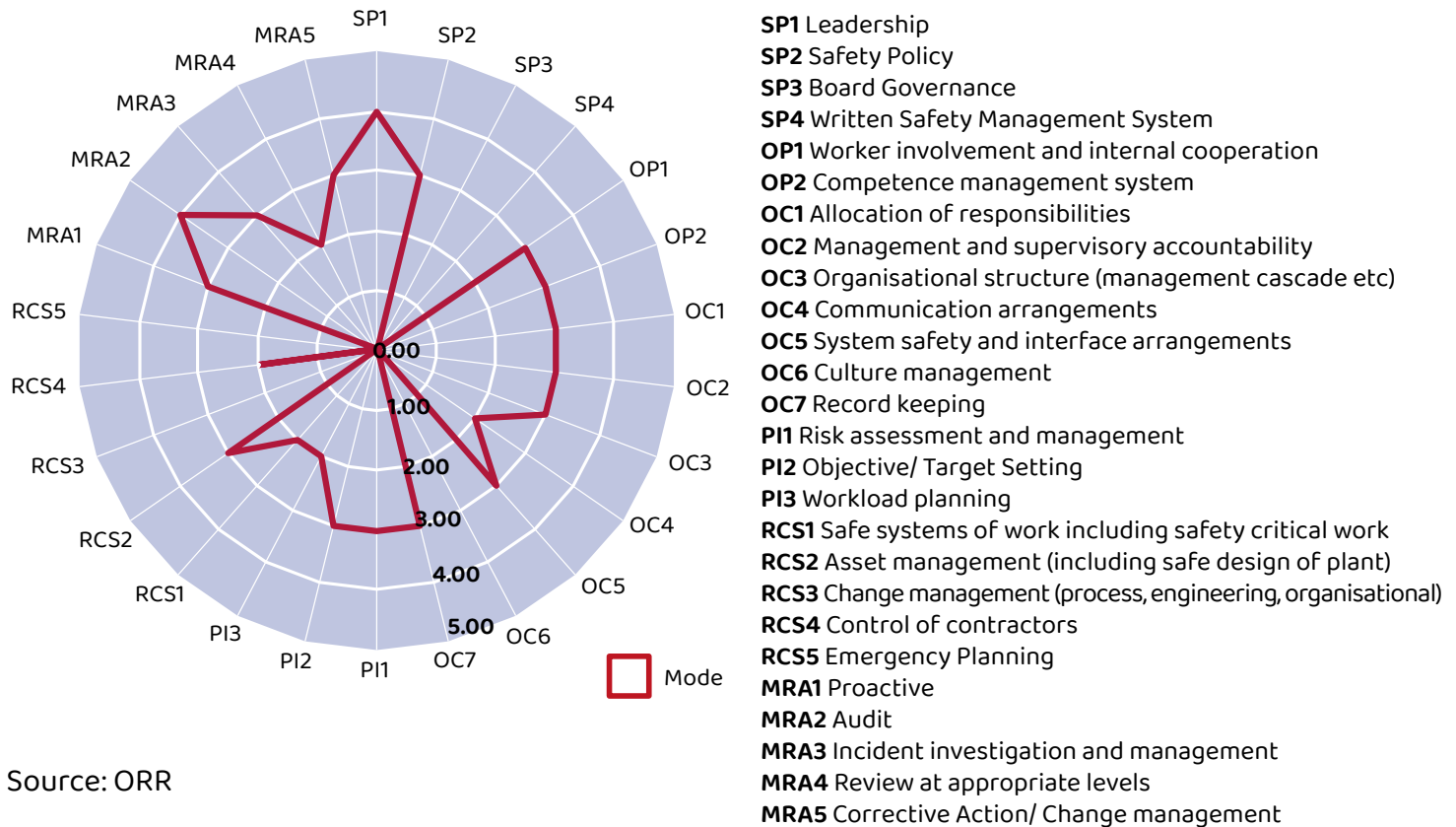
## Data and data quality in this report

- 1.14 This report is compiled using data obtained from various sources across the industry. The majority of data for mainline operations is held in the Safety Management Intelligence System (SMIS) administered by RSSB. More information about SMIS and data quality can be found on the [RSSB website](#).
- 1.15 For some events it has not been possible for RSSB to differentiate reliably between passengers (people on railway property with intent to travel) and other members of the public. This report combines public injuries occurring on trains or in stations with those to passengers.
- 1.16 Data for non-mainline operations is sourced from RIDDOR and from reports supplied by duty holders and industry bodies such as the LRSSB, UK Tram and Heritage Railway Association.
- 1.17 The significant reduction in activity caused by COVID-19 is reflected in reductions in the numbers of reported events. Therefore interpretation of changes in trends in data over the year or comparisons with previous years must be made with caution. For this reason, this report makes fewer references to data than has been the case in previous years.

# Mainline: Network Rail

## Management maturity

Figure 3 – a composite RM3 assessment of Network Rail management maturity in 2020/21



Source: ORR

### Overview

1.18 In several recent annual reports we have stressed the importance of Network Rail not becoming complacent when performance trends seemed to be positive. The events of 2020/21 have illustrated both the strengths and weaknesses of Network Rail.

1.19 The year saw:

- On 12 August 2020, following a spell of extreme, localised rainfall, a Scotrail passenger train derailed at speed after striking washed out material on the track near Carmont. This resulted in the deaths of the train's driver, its conductor and one passenger. The other six people on board were injured.
- A Network Rail worker killed by unsafe machinery at Eastleigh long welded rail depot 01 December 2020 (Eastleigh is an HSE enforced premises).
- A track worker struck and killed by a train at Surbiton on 09 February 2021.
- A track worker killed during a project at Roade on West Coast Main Line 08 April 2020.

- 1.20 Our assessments of Network Rail's management maturity, using our RM3 tool, suggest it does not yet have a sufficiently predictably reliable risk control framework to be confident that good safety performance can be maintained. The events of 2020/21 have illustrated that graphically.
- 1.21 Avoiding future tragic events of this sort requires Network Rail to focus on strategically important areas that have been highlighted in previous annual reports:
- Improving its control of risks to its workforce.
  - Improving the resilience of its infrastructure to increasingly frequent and severe adverse weather events.
  - Strengthening its assurance processes, so that it monitors implementation of its risk control framework more effectively.

## Evidence and activities

- 1.22 Our interventions are planned according to a blend of factors relating to risk priorities and trends, intelligence from investigations and inspections, and priority areas where we believe we can make the most difference.
- 1.23 During 2020/21 we planned to focus, for example, on resilience of the infrastructure, workforce safety and improving Network Rail's assurance arrangements. We explained these commitments in last year's annual report. We have undertaken work in all those areas – but the coronavirus pandemic affected how we delivered some of our work. There were fewer site-based inspections than in previous years. This also meant that the quality and quantity of our evidence was different to preceding RM3 assessments and that it was targeted at the areas of most concern to us. As a result, this year's analysis – even more than in previous reports – is focused on the least well performing aspects of Network Rail's operations. Additionally, we had to ensure sufficient resource for significant investigations such as into the Carmont derailment and the deaths of track workers at Margam in July 2019.
- 1.24 Continuing a positive trend from previous years, we found fewer assessments at the extreme range of the RM3 management maturity model – and the first year where we did not make a single assessment of 'ad hoc' management maturity. Overall ratings are still congregated at the 'managed' and 'standardised' levels. There were, though, some significant improvements from the previous year. In RM3 criterion SP1 'Leadership', for example, the assessed level rose from 'standardised' to 'predictable'. Amongst other things this reflects leadership to the industry during the challenges of the pandemic and in responding openly to the issues revealed by the fatal derailment at Carmont. Improved RM3 assessments relating to monitoring, audit and review reflect that assurance improvements are beginning to gain traction.
- 1.25 These changes indicate sustained efforts by Network Rail to secure better arrangements in areas we have previously highlighted as being strategic priorities, i.e. assurance, safe systems of work on or near the track, and addressing the vulnerability of infrastructure to extreme weather.
- 1.26 However, our inspections of workforce safety and management of civils assets have shown that good progress is often threatened by inconsistent application of improvements and a rush to implement quick fixes without the underlying management systems in place.

## Conclusion

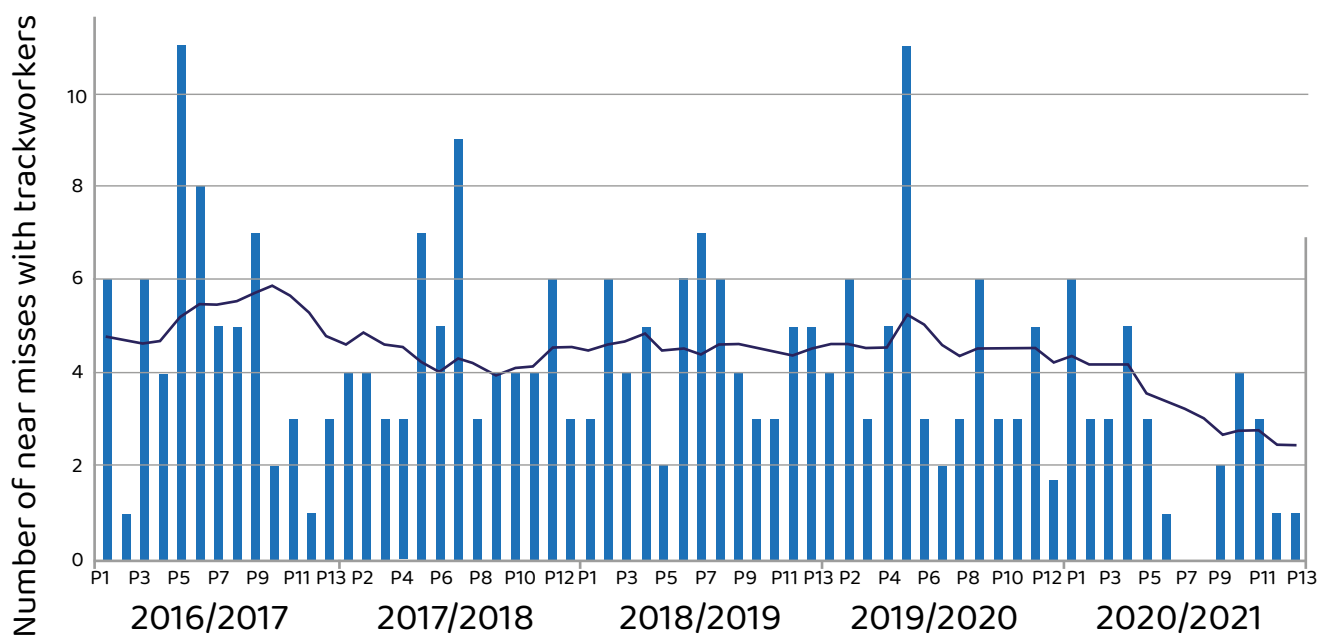
1.27 The year's tragic events confirm many of the notes of caution we have sounded in the past about how well Network Rail's improved safety management record could be maintained. However, the evidence from our inspection work over the year shows that there is reason to be cautiously optimistic about Network Rail's capability to deliver more consistent application of its health and safety management system. Network Rail has already begun work to address the underlying systemic weaknesses in risk control. It should maintain that focus – continuing with targeted initiatives. It should strengthen and enhance existing programmes where necessary – but not rush to accelerate them if that would jeopardise effective delivery.

## Workforce safety

### Overview

1.28 For the second consecutive year two workers were struck and fatally injured on the mainline network by trains. Throughout the past year our work has concentrated on inspection of Network Rail's actions to comply with our track worker safety [improvement notices](#) (served on 8 July 2019), as well as investigation of near-misses as appropriate. The year also saw the death of a member of Network Rail's workforce in a machinery incident at its Eastleigh depot. Although we did not investigate this incident (the Health and Safety Executive (HSE) enforce these premises) we did explore the emerging findings and have encouraged Network Rail to seek ways to improve their safety culture. This will promote better compliance with essential processes and has lessons for the whole company's activities.

Figure 4 – Near misses between workforce and trains.



Source: RSSB

## Evidence and activities

1.29 Last year we said we would set aside time in our forthcoming work plan to maintain our monitoring of progress on Network Rail's Safety Task Force – both centrally and at a regional level. Throughout the past year we have inspected Network Rail's actions to comply with our improvement notices. The two fatal track worker accidents on the mainline network serve to remind of the continued necessity of planning work to avoid working whilst trains are running and developing and implementing systems of work that provide improved protection and warning. The Safety Task Force has taken positive steps to implement improvements, with the year seeing steady (albeit variable) progress across all routes. Following the Surbiton accident Network Rail took the decision to ban protection using lookouts and move to more reliable methods of protection in large part by the end of July 2021, well ahead of the improvement notices compliance date of 31 July 2022.

## Conclusion

1.30 The year saw steady progress towards compliance with the track worker safety improvement notices. More importantly, the amount of work using unassisted lookout protection has declined over the year to 10% at year end. This is a significant achievement in risk reduction. However, as the accident at Surbiton shows, safety improvement has been inconsistent across the country.

1.31 Some common themes have emerged from our inspection work. The number of line blockages that rely solely on signaller vigilance to prevent trains accidentally being signalled into work areas remains stubbornly high, and the availability of line blockages remains limited by the amount of work that a signaller can be expected to do safely. Linked to this is the slow uptake and use of automatic protection and warning technology such as remotely operated track circuit operating devices and semi-automatic track warning systems. This was partly due to the pandemic but also due to technical problems and teething troubles in learning how best to use new technology.

1.32 Whilst we welcome Network Rail's renewed commitment to make lookout working a thing of the past, we have concerns around the sustainability of making this move too quickly. Removing the need to routinely work with lookout protection needs to be done in such a way that the permanent way can be maintained safely and without transferring the risk elsewhere. In this context we note that operational close-calls and near-misses continue to happen. Encouragingly, near-misses with trains declined significantly over the past year. However, close calls rose. Often these are related to line blockage and possession irregularities. Providing secure additional protection for line blockages, and ensuring possessions are securely protected will be essential to carrying out maintenance work safely in the future.

## Track and Lineside

### Overview

1.33 Track – track management on Network Rail infrastructure continues to be at or close to best ever levels as measured by performance indicators. We saw good examples of leadership by the Technical Authority (TA) in drawing up COVID-19 contingency arrangements. Our RM3 assessments mostly remained in the 'standardised' and 'predictable' range. There were improved assessments for allocation of responsibilities and for proactive monitoring, mainly due to the progress made in managing risks from longitudinal timbers. One assessed area reduced in its assessed rating: corrective actions; this arose from the variable delivery by regions of agreed actions to improve section manager workload.



1.34 Lineside – It was positive to see that the improved RM3 assessed levels from last year were maintained in relation to management of lineside assets. The exception was in the category of risk assessment, which dropped from 'predictable' to 'standardised'. The reason for this is a pronounced difference between the effectiveness of identifying and enacting risk controls in TA and regions within Network Rail. We assessed the TA's positive, early planning for ash die-back as 'predictable', for example, but found only 'managed' levels in routes when we scrutinised boundary management.

## Evidence and activities

- 1.35 For Track our major intervention was inspection work on the circumstances of reported failures of track assets. We found that in all cases we looked at Network Rail had taken prompt action to control any immediate risks – but we identified a number of areas for improvement in relation to the consistency and quality of information recorded during track inspections and the application of the assurance framework. We also found differing levels of capability among staff with the same competencies. The most frequent types of failure were associated with rail corrosion in tunnels, rail foot corrosion and deterioration of long timber bearers. These areas are all well known to Network Rail and the subjects of planned improvements.
- 1.36 On assurance, Network Rail has put in place a comprehensive plan of work, with milestones and senior overview that runs through until December 2022. The key to success will be the engagement, buy in and prompt delivery of change at regional and route level. If this is achieved the assessed RM3 level would move to 'predictable'. In 2021/22 we will target our work at plans delivered in the Network Rail regions.
- 1.37 For Lineside - in last year's report we identified a number of areas where management of lineside assets could be improved and undertook to continue to measure progress. We carried out inspections of boundary management, as we committed to in last year's report, and found that Network Rail boundary inspectors were identifying poor condition boundaries consistently well – but after that initial action there was variety in the quality of information recorded and the assessments of risk carried out. Interim mitigations were usually little more than additional inspections, whose usefulness was not clear and there were problems with some of the systems to manage work. We judged the management of poor condition boundaries to be weak and have required corrective actions. The importance of this is emphasised by the fact that animal incursion events gradually increased over the year.
- 1.38 We saw evidence of continued good leadership from the TA in providing tools to strengthen the maturity and capability of lineside staff. We followed progress in the ongoing work regarding Lineside competence to improve the continuing application of the lineside competence framework (section manager assessments), and the development and implementation of a bespoke lineside apprenticeship scheme.

## Conclusion

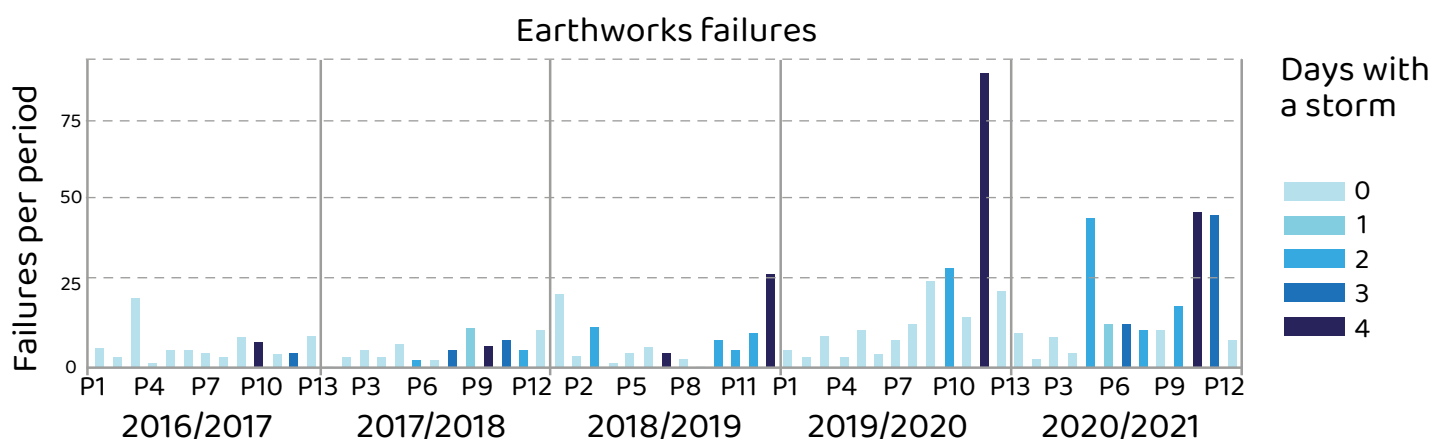
- 1.39 If current good levels of risk management of Track assets are to be maintained the regions and routes of Network Rail need to achieve the same levels of management maturity as the TA. The ingredients are there. With the continuing embedding (use is mandated from March 2021) of TIGER (Track Integrated Geometry Engineers Report) across all routes, staff will have tools to help analyse a wide range of track geometry features in order to make better decisions. Similarly, if regions continue their work on improving level 1 assurance then they will enable better targeting of enhancements to their health and safety management system.
- 1.40 Lineside as a discipline needs to continue to strengthen capability by enhancing competency and assurance. The fatal derailment at Carmont highlighted the importance of water management to the safe management of the infrastructure. Drainage management is in its infancy as an asset function within Network Rail and competes with other aspects of Lineside teams' time and resource. Network Rail has ambitious plans to develop water management as an asset discipline and to better integrate Lineside and other infrastructure asset management functions. We will monitor these plans closely over 2021/22.

## Civil engineering assets

### Overview

- 1.41 The fatal derailment at Carmont in August 2020 was a tragic illustration of why we have been emphasising the need for Network Rail to improve asset resilience in the face of extreme weather. The event highlighted how important it is for Network Rail to be able to identify the conditions when its assets are more likely to fail and to institute targeted mitigations at those assets where the consequences would be most severe. Achieving this requires strengthened arrangements in a range of areas – from provision and interpretation of weather forecasts to smarter application of operational responses to adverse weather. Better understanding and adoption of water management will be at the heart of improvements. We were pleased to see that there were comprehensive recommendations in these areas in the task force reports that Network Rail commissioned following Carmont. We will be closely monitoring their implementation.

**Figure 5 – The number of earthworks failures and days with storms**



Source: RSSB

- 1.42 The year also saw significant failures of a number of structures, including viaducts at Nine Elms and Carron Water. These incidents illustrate the importance of carrying out high quality evaluations of structures examinations.
- 1.43 Over the year our work found that while there were often good examples of leadership in the TA – setting the strategic direction for management of civils assets – there was variable implementation of the risk control matrix by routes and regions. We continued to be frustrated by the slow adoption of remote monitoring of assets and inconsistent application of triggers for considering operational mitigations for extreme weather. There is much work to be done to develop better targeted responses, such as more localised emergency speed restrictions or use of drones to inspect assets.
- 1.44 After the Carmont accident Network Rail commissioned reports by two world renowned experts in their fields. The Lord Robert Mair and Dame Julia Slingo [task force reports](#) have accelerated Network Rail's work in these areas. We are optimistic, for example, about the potential benefits of the Convective Rainfall Alert Tool, and use of Global Systems for Mobile Communications – Railway (GSM-R) systems for application of tailored speed restrictions.

## Evidence and activities

- 1.45 Our major inspection assignment was of compliance with requirements for the evaluation of structures examinations – looking at the quality of the new dashboard system. We also, at short notice, checked on the inspections that Network Rail carried out immediately after the derailment at Carmont.
- 1.46 We continued our monitoring of a number of strategically important aspects of Network Rail's management of its civils assets – including: structures examination compliance; management of scour; drainage asset register completeness and accuracy; earthworks examinations; remote monitoring; identification of failure consequences; weather resilience and climate change adaptation plans.
- 1.47 Structures examination backlogs persist in most regions, and continue to be attributed to poor planning, lack of track access, and lack of resources. These issues have been understood for a number of years, and it remains a concern that they have still not been fully addressed. Also, limited implementation of the Network Rail Structures Evaluation Dashboard means that potential benefits from its large-scale use are not currently being realised. To achieve those benefits, significant investment and cultural change is needed.
- 1.48 A live earthworks monitoring trial (managed by Network Rail's Intelligent Infrastructure Programme) continued during the year. The project now has clear business and technical success criteria (following our intervention) but a number of challenges remain – for example, the key success criterion that the equipment should be able to run continuously over the trial period was not achieved. This is a significant concern as, if the equipment's reliability cannot be assured, the use of this tilt meter technology as a mitigation measure on high-risk earthworks may not be viable.



- 1.49 The slow pace of roll-out of technology across the civils discipline is frustrating. We have seen instances of new technology being developed and trialled – such as use of drones for structures examinations – but this has not led to widespread implementation. We want to see a ‘route to implementation’ for new technology, which will require co-operation between the TA and the regions.
- 1.50 We followed up on concerns in last year’s report around the inspection of tenanted arches that had not been resolved. We met twice with Arch Co (alongside Network Rail), where it was accepted that there must be co-operation between parties to achieve compliance with inspection requirements. Agreed procedures for achieving examinations were put in place in a time bound delivery plan (for Southern region). We hope this can be a template for other regions.
- 1.51 All regions are continuing to identify and verify drainage assets to increase asset knowledge and to complete a full drainage asset database. Whilst completion dates across the routes vary, all routes have plans in place to have completed the asset knowledge inventory by the end of CP6.

## Conclusion

1.52 Network Rail displayed mature levels of safety leadership when it commissioned outside experts to examine how it might improve its management of earthworks and better equip itself to address the challenges of increasingly frequent and severe weather events. The resulting recommendations echo many of the points we have made in these reports and our feedback to Network Rail over the last decade. It is vital that sustained, credible effort is put into achieving the necessary changes to asset safety. Effective delivery of improvements will require Network Rail to:

- Evaluate the recommendations.
- Prioritise the most important for early delivery.
- Draw up plans with quantified outcomes, milestones and end dates. The plans will need to identify those accountable for delivery and will need to describe how sufficient resources will be ensured.
- There will need to be effective governance of the plans, with regular monitoring of delivery against the plans.

1.53 We will work closely with Network Rail to ensure the programme for improvement is suitably framed and delivered.



## Occupational health

### Overview

- 1.54 Our 2020/21 assurance activity with Network Rail's TA shows further continuous improvement in health risk management arrangements, albeit with some loss of pace against the backdrop of the COVID-19 pandemic. We recognise the additional demands this placed on Network Rail last year and commend the agile leadership by the TA and Route Services to support worker health in the face of the unprecedented and dynamic challenges the pandemic created.
- 1.55 Despite the challenges of the pandemic and its impact on such things as availability of face to face medicals, Network Rail sustained a commendable level of delivery against its plans for health surveillance, asbestos management, Hand Arm Vibration Syndrome (HAVS) management and action on respirable carcinogens. There was some evidence of regional differences in delivery and this should be the focus for future improvement.



## Evidence and activities

- 1.56 Much of our work was put on hold due to the COVID-19 pandemic, meaning that our assessment for this year is necessarily based primarily on reports of progress against plan from the TA and Route Services. Most of our conclusions are derived from this more centralised holding to account.
- 1.57 We were impressed by the leadership provided by Network Rail's Chief Medical Officer and team and by Route Services – not just to Network Rail but to the wider industry. Focused and decisive leadership by the centre, working closely with regions, enabled resource, constrained as a result of COVID-19, to be deployed effectively. This included additional TA support to regions in managing the implications of restrictions on face to face assessments of competence and medical fitness, as well as statutory health surveillance, and from Route Services in the procurement of respiratory protective equipment (RPE) and face coverings for the wider industry at a time when access to supplies were limited nationally.
- 1.58 On asbestos, completion of the planned medium priority asset surveys is a positive step but an escalation in pace in some regions may be needed if the September 2021 target for completion of low priority asset surveys is to be met. Stretching programme milestones to agree and implement strategies for managing the remaining unsurveyed assets and for handing over asbestos management to regions as a business as usual activity appear ambitious at the current pace of progress, given the scale and complexities involved. Continued collaboration with, and challenge to, regions on asbestos compliance from the TA will be needed again next year to ensure that regions are in a position to deliver a proportionate and risk-based approach.
- 1.59 Network Rail worked hard to ensure that medicals and health surveillance activities were delivered as well as they could be in the difficult circumstances of the pandemic. This was a considerable achievement. It is unfortunate that the constraints of the year affected the further roll-out of new clinics to provide holistic medical services – but we look forward to the further development of this approach to managing the health and wellbeing of the workforce.

## Conclusion

- 1.60 Notwithstanding the challenges of the pandemic, Network Rail has done well to continue to provide statutory medicals and health surveillance. We have seen some commendable examples of leadership in these areas. Other challenges remain, including those of asbestos management, and improving control of occupational health risks in maintenance and renewals work. The Chief Medical Officer has ambitious plans to further improve the leadership to regions in relation to health matters. Changes are being developed to provide training to managers for mental health and look at the effectiveness of the drug and alcohol testing regime. The provision of dedicated clinic facilities will resume.
- 1.61 Building on steady progress in 2020/21 to improve risk assessment and engineering control for exposures to maintenance welding fume and to exposure to silica in track renewals, further work will be needed to communicate the need for and deliver enhanced engineering risk controls, in line with the revised enforcement expectations for control of carcinogens.

## Level crossings

### Overview

1.62 Network Rail has continued to show good leadership within the TA to set a framework capable of maintaining the risk reductions seen over the last 12 years. It has developed tools and guidance to promote better, more consistent decision making. However, the different regions and routes have some way to go before they will demonstrate comparable levels of maturity in implementing policies and strategies to manage crossings safely.

### Evidence and activities

1.63 Network Rail has achieved significant reductions in risk at level crossings over recent years. In Control Periods 4 and 5 there was a specific focus on risk reduction, via a centrally administered dedicated fund. Despite these improvements, people are killed at level crossings every year (in 2020/21 four people were killed at level crossings managed by Network Rail). It is still, therefore, a priority topic area for us. Performance over the year has been flat, with little change in modelled risk. For the control period, Network Rail has bettered its risk control target improvement.

1.64 Since the start of this control period, risk reduction has reverted to the regions.





- 1.65 In last year's report we promised to inspect how well Network Rail's overarching strategy for level crossing safety is being implemented by each route. In delivering this commitment we were pleased to note that every route had made a plan – but we found considerable variation in the quality of plans across the network. Some routes had long term plans, indicating how every passive crossing had been considered, whilst others had only planned for the next financial year. The variable ambition and credibility of the plans may be linked to one of the observations we made at the time of Periodic Review 18 (PR18) – that there seemed to be inconsistent understanding across the routes of what 'so far as is reasonably practicable' means, and following from that, differing levels of maturity in decision making. The TA has been working through the year to develop a framework to promote more consistent, better quality decision making when it comes to choosing options for level crossings. We have engaged with Network Rail in the development of this tool – and now have some [case studies](#) on our web site.
- 1.66 These case studies are among a number we have developed to illustrate aspects of our new guidance '[Principles for Managing Level Crossing Safety](#)'. We pledged in last year's report to complete this work, embodying structured risk assessment at the heart of our guidance to industry. We have completed the work. We have also made good progress with simplifying the level crossing order process and will be publishing the results of this later this year. We delivered 22 level crossing orders in the year.
- 1.67 We made a sustained effort to work with Network Rail to reduce the number of open RAIB recommendations relating to level crossings, resulting in a significant number of older recommendations being deemed to have been addressed satisfactorily and agreement on what more is required for most of the other open ones.



1.68 Finally, we pressed Network Rail to take quicker action when it became clear there was an issue with the audibility of train horns on the Class 800 fleets. This is a rolling stock issue that has considerable consequences for Network Rail at whistle board crossings, where warning from train horns is the only means of telling crossing users when it is not safe to cross. Longer-term work is being pursued by the industry to understand the issue – but until that time, Network Rail has introduced a targeted and proportionate means of evaluating and mitigating risks at its crossings affected by the problem.

## Conclusion

1.69 Network Rail continues to achieve steadily improving safety management at its crossings. We can see the potential for that to improve further if routes and regions share and adopt good practice. This will deliver more consistent and reliable decision making. That will be further assisted by implementation of the newly developed framework for deciding factors of gross disproportion – though this will have to be introduced with appropriate training and mentoring to ensure that routes, regions and projects have the necessary maturity in risk assessment and understanding of what the law requires when it states 'so far as is reasonably practicable'.

## Electrical safety

### Overview

1.70 Network Rail continued to implement its Electrical Safety Delivery Plan (ESDP) over the year. Regrettably, a number of incidents revealed that it has some way to go before some of its elements are consistently well embedded. There are still too many breaches of Life Saving Rules (LSR) and irregularities regarding staff understanding of when and where electrical equipment has been made safe.

### Evidence and activities

1.71 We see repeated examples of the 'test before touch' Life Saving Rule being carried out ineffectively or not at all. It is a source of deep frustration to us that Network Rail has not successfully embedded electrical LSRs. We accepted them as an interim control until longer term improvements had been introduced.

1.72 In last year's report we undertook to continue to monitor Network Rail's progress in achieving its ESDP and found that there has been steady realisation of the benefits of negative short-circuiting devices and track feeder switches on the DC third rail network. These initiatives bring performance benefits as well as safety improvements – reducing the time taken to set up and relinquish engineering possessions.

1.73 We have not yet seen similar benefits achieved for AC Overhead Line Equipment (OLE). As a result of COVID-19 constraints, elements of the 'Single Approach to Isolation Planning' (SIP) were suspended. These restrictions also limited the ability of our inspectors to carry out site-based scrutiny of a range of aspects of planned improvements to AC lines isolations. We will undertake this work in 2021/22. However, intelligence from the routes indicates that there is confusion and inconsistent adoption of the available improvements, such as physical demarcation of the limits of electrical isolations.

## Conclusion

- 1.74 Network Rail has devoted considerable effort and resource to developing its approach to improving electrical safety. Network Rail's continuing inability to embed the electrical LSRs and improved security of AC lines isolations is overshadowing its demonstrable progress on DC 3rd rail lines. The TA must work with regions, routes and the supply chain to create an unambiguous framework of controls which can be relied upon to be implemented predictably, reliably and repeatedly.

## Human factors and ergonomics

### Overview

- 1.75 We found that Network Rail has a skilled and experienced team of human factors and ergonomics specialists, but their resources are stretched. We also did inspection work on ergonomic matters at Railway Operating Centres (ROCs) and Electrical Control Rooms.
- 1.76 Our work has shown the insights that an understanding of human behaviour can bring to a range of topics. We will continue to use these tools to add value to more of our planned work.

### Evidence and activities

- 1.77 We tracked Network Rail's progress on a range of issues, including integrating human factors into design; fatigue management; signaller error and workload, and manual handling ergonomic solutions.
- 1.78 We followed up RAIB recommendations, particularly relating to signaller workload and safety critical communications. Within the restrictions arising from the pandemic we also pursued some site-specific issues around ergonomics of Rail Operating Centres ROCs and Electrical Control Rooms.
- 1.79 We found that the complexity of managing human factors issues arising from the introduction of the Digital Railway and other new technologies presents a challenge. The Network Rail Ergonomics Team is endeavouring to meet that challenge in a variety of ways, e.g. via implementation of Network Rail's Standard Technical Requirements for Ergonomics and Human Factors and via their work with research organisations to resolve the Human Factors issues around the proposed introduction of Radio Based Limited Supervision (RBLs).
- 1.80 However, there are still areas where risks could have been better controlled – for example, the issues arising with the user-interface of the new electrical control system. We will be pushing for improvement.
- 1.81 Whilst Network Rail has a long way to go to adequately close their risk gap on fatigue controls, we are encouraged by its appointment of a fatigue specialist and securing of a 'deep' fatigue expert to support their Fatigue Improvement Programme.

1.82 Planning of manual handling tasks remains an issue and requires local engagement. The risk assessment framework is poor but improving; Network Rail has considered using HSE manual handling assessment tools but requires them to be bespoke as there are particular challenges for the rail industry since tasks are not in fixed locations and are subject to all weathers. However, it would be useful to score high risk tasks in order to enable targeting of efforts in areas of greatest need. A new manual handling training course had been affected by COVID-19 but an e-learning course is now in progress.

## Conclusion

1.83 Network Rail has demonstrated growing maturity in, for example, its progress with regards to the management of human factors and ergonomics integration into projects. However, Network Rail needs to further demonstrate its commitment by ensuring its Ergonomics Team is sufficiently resourced and by achieving consistency in the understanding, appreciation and application of human factors across the business.

1.84 We are planning some wider work regarding spoken safety-critical communications and plan some additional inspection activities with regards to the ROCs for the evaluation of the management of signaller error and workload, and assessment of ongoing updates to the user-interface for the new electrical control system.



## Mainline: Passenger Train Operating Companies

Figure 6 – a composite RM3 assessment of passenger train operating companies management maturity in 2020/21



Source: ORR

### Overview

1.85 In 2021/22 mainline passenger train operating companies have again provided us with evidence of improvement in the maturity of their risk management arrangements. This year the composite findings above show that we have increased our assessment of maturity to 'predictable' for another two criteria, Internal Co-operation (OP1) and System Safety and Interface Arrangements (OC5). No criteria assessments have decreased compared with last year, and we continue to have evidence of strong leadership in passenger operators. Our evidence to support these assessments comes from all our interventions with operators including investigations, permissioning work, inspections and the extensive work we have undertaken to assess COVID-19 risk management throughout the year.

### Evidence and activities

1.86 COVID-19 introduced such widespread uncertainty around how such a hazard, so prevalent in society, should be managed by the passenger operators that it was essential that our proactive plans for 2020/21 were scaled back, to lead the industry through managing the risk. We set out some guiding principles for our duty holders, indicating our expectations for managing the risk, and we worked in a highly effective, tri-partite and collaborative way with the operators, their staff and the trades unions, on some more detailed principles through the Rail Industry Coronavirus Forum (RICF).

- 1.87 For each duty holder, still operating through lockdowns, we worked with them to understand how they were managing the risk of COVID-19. We routinely provided advice, particularly when government measures to control the spread of the virus changed, and undertook site inspections, including joint visits with public health bodies. We looked for good practice and shared this with other operators. We found that measures were effective and there was a consistent approach across all operators. Consistency is important so passengers know how any operator will manage their journey during the pandemic and how they will be expected to act and comply with the government measures.
- 1.88 In our report last year, we said we would use the evidence we gained from our COVID-19 work with operators to inform our RM3 assessments for 2020/21. What stands out from these inspections is the level of collaboration and cooperation. Operators have moved from trying to understand how to manage the unknown in March 2020, to having COVID-19 risk management as a well understood, business as usual activity, with high compliance. This cooperation has occurred at every level within an organisation, and across organisations, and it is testament to the way all have worked together. All have recognised the essential and valuable contribution from the trades unions and, not least, their safety representatives. Our evidence from this work has enabled us to increase our maturity assessments for two criteria to 'predictable' this year. These are Worker Involvement and OP1 and OC5.
- 1.89 Our evidence for our RM3 assessment is also based on our investigations and enforcement, which are described in more detail in the following sections on Workforce Health and Safety, Platform Train Interface, Operational Incidents and Rolling Stock. It is also based on the work that remained in our adjusted proactive workplan for 2021, which included:
- New, transferred and modified rolling stock.
  - Organisational change management.
  - Management of drivers and driver manager competence.
  - Operational incidents.
  - PTI management.
- 1.90 We published our principles around Driver Controlled Operation (DCO) in April 2017, setting out how duty holders can achieve the high-level goals of health and safety legislation when managing the risk of train dispatch. We have continued to work with stakeholders to ensure the principles are recognised by all, and this has required further consultation and collaboration. This year however, those that have been working on the principles, in ORR, the trades unions and the Rail Delivery Group, have also been working on how to deliver effective driver management through the pandemic. Further collaborative activity will be needed in 2021/22 to ensure the principles are embedded in industry.
- 1.91 The range of maturity levels that we determined from all of these interventions with all of the passenger operators is also shown in the diagram above. The range, similar to the modal average, shows a continuous improvement; there were no assessed levels below 'managed' this year. In 2019-20, there were 11 criteria where an assessment of 'ad hoc' was given for at least one operator.

## Conclusion

- 1.92 The level of collaboration and co-operation to manage the risks to the workforce and passengers from not just the pandemic, but in other activities, stands out as the real success of 2020/21 for mainline passenger operators. The lessons learnt from such collaboration, supported by different ways of working which we have had to embrace, must continue. RM3 clearly indicates that collaboration is key to achieving higher levels of risk management maturity.
- 1.93 Going forward, in our 2021/22 proactive work plan, we will be undertaking work with all operators on Signals Passed At Danger (SPAD) management. We want to ensure the downward trend in estimated SPAD risk continues. We will also commence a two-year programme of inspections looking at operational incidents, focussing on control room decision making. We will monitor the progress with repairs to cracks found in the recently introduced Hitachi and CAF trains, and widely reported on, through a second two-year programme around rolling stock maintenance and inspection.
- 1.94 We will continue to inspect arrangements for managing the PTI, as this remains a priority risk area for us. These inspections will include looking at maintenance and installation of tactile paving and warning lines and ensuring that, as passenger numbers recover, that employees remain competent, and supported, to deal with the risk of managing the PTI on a busy platform. A priority for 2021/22 is completion of our collaborative work on Driver Controlled Operation, as we consider these deliver the best level of risk control for train dispatch.



## Workforce health and safety

### Overview

1.95 COVID-19 impacted on our proactive work activity in 2020/21 necessitating that activities to inspect other risk areas were deferred to enable our inspectors to focus on the arrangements train operating companies put in place to manage the risk from exposure to COVID-19. No formal enforcement activity took place in relation to COVID-19 risk control, however three improvement notices were served on operators during the year; two related to depot safety and one associated with a driver falling from a train on the Stourbridge branch.

### Evidence and activities

1.96 The evolution of measures introduced to control against COVID-19 have tested operators throughout 2020/21. The implementation of social distancing arrangements, particularly for employees that frequently need to work in close proximity to one another or passengers, was a challenging concept for operators and they looked to us for guidance through our inspector leads, particularly in the early weeks of the pandemic. In April, we published guidance for operators on implementing COVID-19 public health advice, initially focussing on achieving social-distancing and then expanded to cover the use of face coverings.

1.97 This guidance aimed to offer practical advice, through key principles, on how to achieve the government COVID-19 control measures. We worked at pace and collaboratively with trades unions, industry bodies and train operating companies to keep in-step as additional controls, such as face coverings, were mandated. UK health and safety legislation was not designed around a health pandemic, nevertheless our evidence is that this legislation, and particularly focussing on the requirements for risk assessment, has provided an excellent, and importantly, well-understood framework for managing the risk of COVID-19 exposure. The guidance was welcomed by operators and led to further collaborative work between our inspectors, operators, the trades unions, the Rail Delivery Group and RSSB, and the publication of the more prescriptive principles by the RICF.

1.98 The approach adopted by RICF demonstrates what can be achieved by an effective tri-partite (employer/employee/regulator) working arrangement as envisaged by Lord Robens and the Health and Safety at Work etc Act 1974, nearly 50 years ago.

1.99 We have undertaken proactive work with all train operating companies not in hibernation, around the management of COVID-19 risk assessment. Throughout the pandemic, inspectors have supported on-site inspections of risk controls with virtual meetings. There have been a limited number of outbreaks, both at stations and depots, and we have worked with environmental health and public health teams to assess the adequacy of controls, often through joint site visits. No enforcement notices have been issued, but we continue to investigate two deaths to determine if these may have been as a result of a failure of controls leading to workplace exposure to COVID-19.



1.100 Overall, we have seen highly effective leadership in all train operating companies. This has ensured that risk assessment has been effectively used to identify necessary control measures, including:

- Early identification of vulnerable employees.
- Activities being adapted to facilitate social distancing.
- Creation of 'bubbles' where people have to work in close proximity, such as driver assessments and training.
- Limiting activities which are not necessary for safe operation, such as revenue collection and catering.

1.101 Importantly, we have observed that operators have put in place enhanced monitoring to ensure controls are being followed, with one operator introducing COVID-19 marshals to report on compliance.

1.102 Through the devastation of the pandemic, operators have followed the lead of RICF and we have seen highly effective collaboration and worker involvement. We have increased our cross-operator RM3 assessment of OP1 (worker involvement and internal co-operation) to 'Predictable' this year from 'Standardised' in 2019-20.

1.103 In last year's report we reported on our investigation of a train driver who died from the injuries he suffered as he walked between two trains that were being coupled at Tyseley Depot. This year we have undertaken further inspections and investigations of incidents and complaints associated with depot health and safety.



- 1.104 We issued an improvement notice on West Midlands Trains in November 2020 to undertake a suitable and sufficient risk assessment for activities being undertaken adjacent to a running line where we found no physical separation and inadequate lighting and walkways. In January 2021, we also served an improvement notice on South Western Railway where we found inadequate supervision and instruction to ensure the health and safety of persons working at the depot. At a third depot we found such widespread poor compliance with basic health and safety provisions, including welfare, slips/trips/falls hazards, electrical safety and work equipment, that the most expedient way of dealing with the issues was to call the managing director to an urgent meeting. We summarised our findings and warned that if non-compliance continued we would consider escalation.
- 1.105 We reported last year that the Rail Delivery Group's (RDG) 'Passenger Operators Safety Group' (POSG), has identified depot safety as a priority area for its safety improvement programme and continues its review of depot safety through a sub-group. We are an active member of POSG and we will monitor the progress and outputs to ensure that the focus on worker safety and culture in depots is maintained.
- 1.106 We also issued an improvement notice on Pre-Metro Operations Limited, operators of the Parry People Mover on the Stourbridge Town branch, following the fall from height of a train driver leaving the cab to operate a ground frame.

## Conclusion

- 1.107 Early in the work year, COVID-19 seemed like an overwhelming challenge to the passenger operators impacting on every area of their operation, maintenance activities and risk controls. We worked with operators and focussed their approach on the well-established mechanisms they have in place to deal with any risk, and we facilitated the development of guiding principles. Whilst there have been localised outbreaks of COVID-19 infections and we have provided advice on controls in place, we have also found operators have good systems in place to monitor compliance with controls. There has been collaboration at all levels between employers, trade unions and ORR as the health and safety regulator, such that the controls in place for workplace health and safety are well-established and accepted as 'that is how we do things now'.
- 1.108 The number of issues related to depot health and safety and poor compliance with basic legal requirements, remains a concern. The mainline passenger operators must ensure that monitoring, audit and review of depot health and safety is on their agenda. They should support the review being undertaken by RDG on depot safety and act on its findings to improve on a too-frequently found culture and acceptance of weak health and safety risk control.

## Platform Train Interface

### Overview

1.109 In 2020/21, despite the very large decrease in the volume of passengers carried due to COVID-19 we have again seen a number of incidents at the PTI and it remains a priority topic for our intervention. We have served two improvement notices in the year associated with dispatching trains and provisions for wheelchair passengers using trains. We have inspected management of the PTI as part of our more general assessment of management of COVID-19 risk and found excellent practice of social distancing measures supporting PTI risk management.

### Evidence and activities

- 1.110 In October, a mainline charter train was dispatched from York station with a door open, leaving members of the train staff on the platform. An improvement notice was served on the operator, West Coast Railways Limited, initially requiring them to review their risk assessments for dispatch from the station. We granted an extension to the notice to allow them to complete a review of dispatch arrangements for all stations that they call at. Legislation prohibits the operation of rolling stock with hinged doors of the type used by the operator and other organisations offering charter services, without central door locking. To enable charter operators to continue to offer a 'heritage experience' historically ORR has granted exemptions to allow the continued operation of such stock through the provision of alternative secondary locking arrangements and increased supervision by train stewards. However, we have also clearly set out our expectation that the operators will progressively introduce central door locking, or equivalent locking systems, on their fleets before the current exemptions expire in March 2023.
- 1.111 An improvement notice was also served on South Western Railway in October. This required the operator to put in place arrangements to ensure that, when a wheelchair-compatible doorway in a Class 444 or Class 450 rail vehicle is open at a platform at Liphook station, and a disabled person in a wheelchair wishes to use that doorway, a compliant boarding device is fitted between that doorway and the platform. This is the first occasion that we have issued an improvement notice on an operator under The Rail Vehicle Accessibility (Non-Interoperable Rail System) Regulations 2010. South Western Railway is working with Network Rail to introduce step free access at Liphook. Our action, in line with our enforcement policy, has had a positive impact in reminding other operators of the provisions to secure accessibility of the railway network, and the sanctions that can be imposed to achieve compliance. Network Rail proposals to install a new footbridge without step-free access at this location were rejected by DfT following our objections.

- 1.112 Following an incident in February 2020, when a visually impaired man was struck and fatally injured by a passenger train after he fell from the platform at Eden Park, RAIB has now published its investigation report into this incident. The platform did not have tactile paving to warn visually impaired persons of the platform edge, but other tactile warnings were installed at the top and bottom of the stairs used to access the platform. Government funding is being made available to accelerate the fitment of tactile warnings on all platforms and we are working within industry groups to ensure that the fitment is risk based, targeting those stations where there is partial fitment of tactile warnings, first.
- 1.113 We are also concerned over the application of platform warning lines and tactile strips which have been incorrectly positioned or not applied over the full length of a platform. Additionally, there is too frequently evidence of failed maintenance regimes with warning lines, and yellow lines in particular, faded or worn away. In 2021/22 we will act to address these inconsistencies and maintenance issues.
- 1.114 Throughout the year, we have undertaken inspection of the arrangements in place to manage the risk of COVID-19 infection. Our evidence is that operators have not looked at the risk of COVID-19 in isolation but ensured that any controls do not compromise the management of other risks, such as the PTI. We have observed that measures such as one-way pedestrian flows, managing the journey through a station, and control of access to platforms to facilitate social distancing, have also been beneficial in managing risk at the PTI. With relaxation of COVID-19 measures, we will be looking to ensure that operators are ready for increasing passenger numbers and where employees have responsibilities for managing risks, such as dispatch on crowded platforms, they remain competent to do so.



- 1.115 We have continued to work with industry through the RSSB People on Trains and Stations Risk Group and the PTI working group, to understand the work being undertaken by industry to improve the management of risk at the PTI. We are particularly encouraged by work looking at technology which can detect people being trapped in doors which has led to people being dragged by the train as it departs. We have also seen excellent collaboration between RSSB, Network Rail and operators to identify platforms which, if reconstructed, could allow a network wide improvement and consistency in stepping distance.
- 1.116 We fully support the use of the RSSB PTI Risk Assessment Tool and we have listened to duty holders' experience of using this tool. Through this we have collaborated with industry to form a common position statement which supports operators and the continued development of the tool. It is encouraging to see new operators like Transport for Wales using the tool, following their review of how they manage PTI risk.

## Conclusion

- 1.117 We are pleased to see that the industry is working to continuously improve management of risks at the PTI, looking for technological solutions and sharing experience and striving for a railway that is accessible to all. We want to support charter operators to continue to provide the unique experience they offer, but we are also looking for evidence that they are moving to compliance with legislation and fitment of central door locking before March 2023.
- 1.118 RSSB are leading the industry through the review and development of the PTI Risk Assessment Tool, and it is good to see new operators turning to the model to support their operations. We recognise that warning signs and markings are a key part of managing risk at the PTI, but operators must ensure that these measures are maintained in order to be effective, so we will undertake inspection in this area in 2021/22.
- 1.119 As we move towards relaxation of COVID-19 measures, operators should review their PTI risk controls and ensure there is no skill-fade on ability to deal with larger numbers of passengers, for example when dispatching trains.

## Operational Incidents

### Overview

1.120 The underlying estimated level of risk associated with SPAD was 26% of the baseline figure of 2006, with a particularly steep decrease over the year since April 2020. We have investigated a number of operational incidents in the year with poor driver alertness and attention being a common underlying theme. We issued one improvement notice around driver management competence following the investigation of a SPAD on London Underground infrastructure, involving a mainline operator's train.

### Evidence and activities

1.121 We have continued to investigate incidents of SPADs which have a potentially severe outcome, which are ranked as 20 and above by the RSSB SPAD risk ranking tool. The total number of potentially severe SPADs is used as an indicator of the underlying SPAD risk and the number occurring in 2006 was set as the baseline for monitoring the underlying trend.

1.122 This year the estimated SPAD risk was 26% of the 2006 baseline, a fall from 76% in April 2020. Similarly, we have seen a reduction in other operational incidents where driver alertness is a factor, such as opening doors on the wrong side or when part of the train is not next to a platform and failing to call at a station. We believe that the uptake by industry of the RSSB SPAD strategy and use of the Red Aspects Approaches to Signals Tool (RAATS) has driven this improvement, though we should not ignore that there have been timetable changes and service reductions as a direct consequence of the COVID-19 response. This has reduced the pressure on the system with the result that drivers are approaching fewer red signals.

1.123 We have investigated two significant incidents where the outcome could have been severe:

- In June 2020, a Chiltern Railways passenger train passed a signal at danger on London Underground Limited infrastructure. The train stop system brought the train to an emergency stop, but the driver then reset this and restarted the train without informing the signaller. The driver applied the emergency brake when he realised a collision was imminent. Our investigation found that the driver managers at Chiltern Railways Marylebone Depot lacked the resources and full traction and route knowledge (for both Network Rail and London Underground) to effectively assess its drivers. An improvement notice was served on The Chiltern Railway Company Limited in March 2021.
- In March 2021, a Merseyrail train collided with the buffer-stop at the end of the branch at Kirkby. It is estimated that the train was travelling at 30mph at the point of impact. Our investigation is looking at the design and functionality of the signalling infrastructure and whether there were issues associated with the driver's vigilance.

1.124 We have also investigated incidents of over-speeding on the East Coast Main Line involving two operators using Hitachi AT300 trains. In one instance the driver had allowed the train to reach 148mph. The maximum speed at the time was 125mph. We found that the trains, whilst fitted with a form of 'cruise-control' which must be set by the driver, do not have a maximum speed

restriction programmed in the software. This change is now being progressed by Hitachi. In the interim, the affected operators have introduced several mitigation measures to reduce the risk, these include urgent safety notices and additional staff briefings around speed limiters which can be set up by the driver. Operators should have the competence to understand both traditional mechanical engineering and the electronic systems and software of the vehicles they are operating, so they can make informed and appropriate challenge to the manufacturers.

- 1.125 In these examples, and other investigations and inspections we have undertaken in 2020/21, there has been a recurring concern around driver alertness and attention. We are a key player in the steering group being led by RSSB into supporting drivers through monitoring alertness and attention. COVID-19 has delayed progress on this key project. However, the operational requirements for a trial to test technology have been identified. We are now looking at how this can be funded and securing the support of operating companies from intercity, suburban and freight operators to be involved in the trial. This will ensure all types of operation and driving styles are captured.
- 1.126 In 2021/22 we will inspect all mainline operators' arrangements for driver management competence, specifically relating to SPAD investigation and their defining subsequent actions and improvement plans for drivers. We will also commence a two-year programme of inspections with all operators specifically looking at management of operational incidents and decision making by control room staff.

## Conclusion

- 1.127 The considerable reduction in underlying risk associated with SPADs is a welcome improvement, and whilst the structure of the RSSB SPAD strategy and use of tools like RAATS has been highly influential in this improvement, the reduction in train services has also eased pressure on the system. As we move to restoring timetables, that pressure will return so operators need to ensure that staff are supported through robust driver management, training, assessment and monitoring, proactively managing the change and recovery back to full service provision.



## Rolling stock

### Overview

- 1.128 In 2020/21, with the exception of charter operations and the Night Riviera sleeper service, trains with droplight windows have now been retired from mainline operations.
- 1.129 We have inspected arrangements to manage the introduction of new trains and trains being transferred between operators. Generally, we found this was well managed, but there were two operators who failed to robustly assess the compatibility of the new/transferred trains with their routes and this would have resulted in an increase in safety risk if the trains had continued to run on those routes without additional risk controls in place. We found good examples of worker involvement and internal co-operation where changes to rolling stock were taking place.
- 1.130 No formal enforcement activity was undertaken in relation to management of rolling stock assets this year.

### Evidence and activities

- 1.131 In our last annual report we highlighted the risks of droplight windows, where passengers lower a window to reach an external door handle. We wrote to all operators early in 2018 to establish how they would manage the risk going forwards, with particular emphasis on design modifications to remove the droplight windows. In 2020/21 we were pleased to see that many of these plans had now been realised and the droplight window risk had significantly reduced on the mainline network through:
- retrofitment of power-operated sliding doors.
  - realisation of plans to introduce new rolling stock.
  - mothballing of the remaining trainsets which are not currently required due to the service reductions associated with the impact of COVID-19.
- 1.132 Great Western Railway is still operating stock with publicly accessible droplight windows on its Night Riviera sleeper fleet, and the operator has shared its plans with us to fit window locks to this fleet. Our attention will now return to the progress charter operators are making to identify design changes and technological solutions to reduce the risks from droplight windows.
- 1.133 The widely reported cracking around lifting pockets, anti-roll bars and yaw dampers on new Hitachi and CAF trains was first identified in April 2021 and so is outside the timeframe of this report to discuss in detail. However, the significant repair work that will be required to rectify these issues may see a temporary return to service of trains with droplight windows. We will assess these plans to ensure that there are controls in place to mitigate the increase in associated safety risk.



- 1.134 We have increased our own capability to understand the complexities of electronic systems and software, and the measures that need to be taken to control the risks of new or changed systems and software versions. This has enabled us to make an effective challenge of individual operators to enhance their own capability around understanding the complex systems on the trains they operate. We are also a member of the RSSB High Integrity Systems group whose aim is to share and establish best practice in managing risk in this evolving area.
- 1.135 We have continued putting pressure on train designers and operators to design out risk, and we are particularly concerned about features which provide a foot or handhold to either climb up on to the roof of the train or ride on the outside of the vehicle (train surfing).
- 1.136 We have maintained the challenge to operators to address these matters, and have evidence that operators are not prepared to accept the risks. This has driven modifications being made to the Hitachi AT300 fleets inter-vehicle connectors, to remove the ladder effect of the cables, and the elimination of foot and handholds on Stadler's Class 777, 745 and 755 trains.
- 1.137 We have inspected the arrangements operators have in place for introducing new trains, trains being transferred from other operators, and upgrades and modifications to older trains. We have many examples of how these changes have been managed well, for example the transfer of the Class 707 fleet to Southeastern demonstrated high levels of maturity in risk management across the RM3 criteria.
- 1.138 There were also poor examples of change management, the most concerning example being of a train type being returned to a route, after an absence of 12 years, and the assumption that nothing had changed on the route in that time. In fact, new signalling systems had been introduced and the gauging standard had changed, and there was now a risk that the trains may conflict with structures on the route and evidence of electromagnetic interference with signalling equipment. In this, and other cases, the operator should have followed Railway Industry Standard RIS-8270-RST Issue 1 Route Level Assessment of Technical Compatibility between Vehicles and Infrastructure.
- 1.139 Where older stock is being refurbished we are looking to ensure that safety systems, such as Train Protection and Warning System (TPWS) and the environment for the driver are brought up to contemporary standards. We are working with the Associated Society of Locomotive Engineers and Firemen (ASLEF) and RSSB to identify the best way to secure these improvements.
- 1.140 Across our inspections of rolling stock activities, we have consistently seen high levels of engagement with safety representatives over changes planned for rolling stock.
- 1.141 Maintenance arrangements for many of the new fleets have now changed, with the manufacturer delivering the full maintenance programme through a contract with the leasing company rather than the operator. Some operators have found this challenging, as they perceive they do not have contractual influence. They need to work with the maintainer on collaboration and the maintainer needs to understand the operator's requirements. This failure to act appropriately on an operator's concerns is well demonstrated by a maintainer returning trains to the operator that have had intermittent safety related defects reported (warning horns not working), with no rectification work undertaken as no fault could be found.

## Conclusion

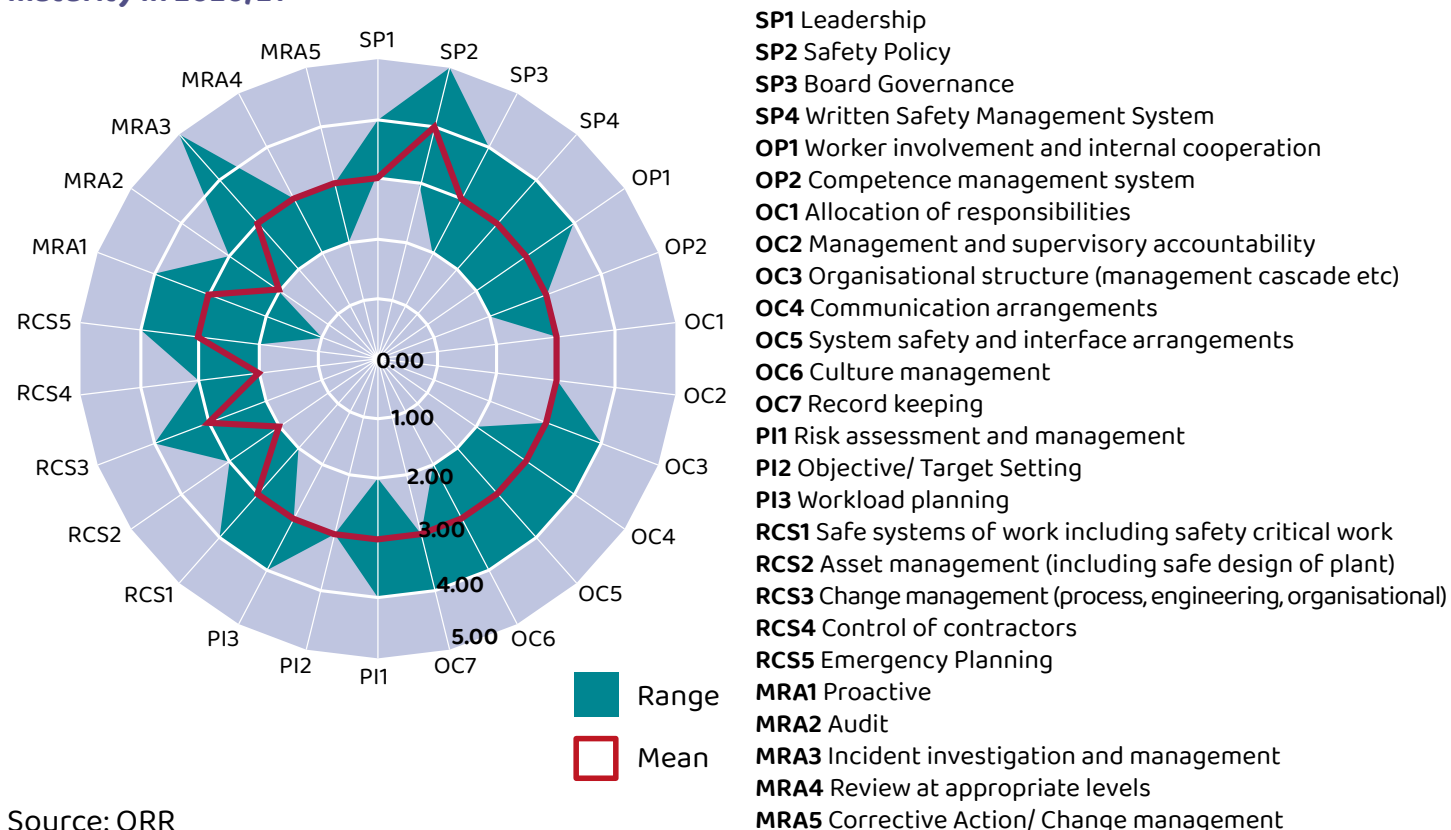
- 1.142 The mainline train operators have achieved a substantial reduction in the risk associated with droplight windows, by eliminating the trains from their routes or making design modifications. We now look to the charter operators to make similar modifications to their vehicles and provide 21st century levels of safety whilst delivering a heritage experience.
- 1.143 Operators and train maintainers must continue to work in collaboration to ensure that the operator understands the equipment they are operating and vehicles are handed back for service with operator's concerns acted on.
- 1.144 Train manufacturers must also understand the requirements of the operator and the environment the train will be operating in and ensure that risks of 'train surfing' and vehicle climbing, in particular, are eliminated. Operators need to effectively manage change and ensure that these new trains and trains that are transferred to them are, in fact, compatible with their routes, through compliance with [Rail Industry Standard RIS-8270-RST](#).



## Mainline: Freight Operating Companies

### Management maturity

**Figure 7 – a composite RM3 assessment of the freight operating companies' management maturity in 2020/21**



Source: ORR

### Overview

1.145 Our assessment of health and safety management capability 2020/21 shows that the freight sector as a whole is largely performing at a standardised level, although there are considerable variations in certain areas, particularly around monitoring, audit and review, which may account for why we continue to find examples of poor health and safety risk control alongside examples of best practice.

### Evidence and activities

1.146 The figure above is a composite of results we have obtained from all of our interactions with freight duty holders in 2020/21, including inspections, investigations and statutory work.

1.147 Despite the challenges posed by the pandemic, we were able to undertake a programme of proactive inspection work throughout the year that covered a range of topics including: the management of health and safety risks associated with COVID-19, arrangements to prevent unauthorised access at freight sites and workplace health and safety. These activities were selected based on our knowledge of the sector, previous incidents, and our strategy for regulating health and safety risks on Britain's railways.

1.148 We have continued to engage with the work of the National Freight Safety Group and particularly welcome the group's decision to focus on identifying system-wide solutions to the risks associated with train preparation and rolling stock condition through its "Condition of Freight Vehicles on the Network" workstream. We also held regular liaison meetings with Network Rail's Freight and National Passenger Operators Route, contributed to our wider work with freight end users and maintained our strong working relationships at an operational level with colleagues from HSE and the Office for Nuclear Regulation.

## Conclusion

1.149 Our inspections have concluded that freight operating companies generally have appropriate systems in place to manage the key health and safety risks associated with their operations. The work of the National Freight Safety Group and the Cross-Industry Freight Derailment Group continues to demonstrate the effectiveness of collaboration in addressing sector-wide risks. We found that duty holders had suitable arrangements in place to manage health and safety risks linked to COVID-19. Our inspection of how duty holders prevent unauthorised access showed that this is an area where freight operating companies have taken steps to improve risk control in recent years.

1.150 However, we continued to find examples of occupational health and safety risks being poorly controlled, together with a number of serious operational incidents, which highlights the need for the freight sector to ensure that risk controls are properly implemented and arrangements are in place to monitor their effectiveness.



## COVID-19

### Overview

1.151 COVID-19 represented an unprecedented challenge in terms of health and safety risk control to businesses across the country. Over the course of the year we provided advice and guidance to the freight operators so that they could continue their vital work to support homes and businesses. Our inspecting staff continued to work closely with duty holders during this time, carrying out a programme of inspection that examined arrangements for managing the emerging health and safety risks associated with COVID-19.

### Evidence and activities

1.152 Our inspections found that freight operating companies had suitable systems to assess the risks associated with COVID-19 and had implemented appropriate control measures that incorporated Public Health England guidance, as well as information produced by regulatory and industry bodies. The control measures identified during inspections included standard COVID-19 controls adopted by all organisations such as the identification of medically vulnerable members of staff as well as enhanced cleaning regimes for premises and rolling stock. We also examined how duty holders were managing the fitness and competence of their staff when it became necessary to delay competence assessments and medical examinations, along with monitoring of staff fatigue at times when access to hotel accommodation was limited.



1.153 A number of freight operating companies collaborated to develop and implement an enhanced COVID-19 testing regime for operational staff, so that route and traction learning could recommence in summer 2020 to support the delivery of essential rail head treatment services during the autumn and winter.

## Conclusion

1.154 The freight sector has responded well to the pandemic, implementing appropriate control measures to ensure that operators could continue their essential work to support the country. Collaboration between different organisations meant that duty holders were able to address freight-specific matters in a standardised manner.

## Freight Train Derailment

### Overview

1.155 Freight train derailments represent a significant risk to the safety of rail users. During 2020/21 we continued to engage with the work of the Cross-industry Freight Derailment Working Group and investigated specific incidents.

### Evidence and activities

1.156 On 26 August 2020, a freight train conveying petroleum products from Milford Haven to Theale derailed at Llangennech, between Llanelli and Swansea. A number of the wagons subsequently caught fire and over 300,000 litres of fuel escaped, causing significant pollution to a nearby Site of Special Scientific Interest. The railway infrastructure also sustained considerable damage leading to extended disruption to passenger and freight services while repairs were completed. We deployed inspectors to the incident site and the matters remain under investigation by us, RAIB and Cyfoeth Naturiol Cymru/ Natural Resources Wales. The Llangennech incident ultimately highlights the catastrophic consequences that can result from freight train derailment.

1.157 The cause of many freight derailments is often the interaction of several different factors relating to track geometry, rolling stock condition and vehicle loading. Since 2015 the Cross-Industry Freight Derailment Working Group has brought together representatives from freight operating companies, Network Rail and freight end users with technical specialists from industry and academia to identify system-wide control measures in order to reduce the risk of freight train derailment. These included expanding the analysis of Wheel Impact Load Detector data and the development of loading guidance for bulk products.

1.158 In August 2020, we were pleased to endorse the Cross-Industry Working Group's "Movement to Business as Usual Report" that set out how the freight sector intended to implement the group's findings. The production of this report represented a considerable achievement in the railway industry's work to address freight derailment risk. The Cross- Industry Working Group has both demonstrated the importance of duty holders collaborating on health and safety matters and highlighted the benefits of engaging with key stakeholders from the wider industry, such as freight end users. The format adopted by the Cross-Industry Freight Derailment Working Group should be considered as an exemplar for how the railway industry can work together in future to address other system- wide risks.

## Conclusion

1.159 Given the potentially catastrophic outcomes that can result from freight train derailments, it is essential that the work of the Cross-Industry Freight Derailment Working Group is implemented throughout the railway industry. Health and safety legislation places clear duties on all organisations to manage the risks associated with their operations. We therefore expect freight operating companies and Infrastructure Managers to incorporate the cross-industry group's findings into their risk control arrangements.



## Workplace Health and Safety

### Overview

1.160 As part of our regular work to assess freight duty holders' management of occupational health and safety risk, we carried out a programme of inspections of operational premises. We expect duty holders to have robust arrangements in place to control risks to the workforce, contractors and railway users. We continue to take appropriate enforcement action when duty holders fail to meet this standard.

### Evidence and activities

1.161 During 2020/21, we undertook inspections at a range of freight sites. Our inspections continue to reveal considerable variation in how occupational health and safety risks are being managed across the sector. Examples of issues where improvement was necessary included:

- Inadequate track maintenance at a freight yard in the Thames Valley leading to a risk of derailment.
- Failures to manage work at height safely at a depot in Yorkshire.
- Multiple examples of sites where standards of housekeeping needed to be improved, with inspectors finding obstructed walkways, scrap materials forming slip, trip and fall hazards, and damaged or missing point boards.

1.162 In March 2021, DB Cargo was fined £200,000 after pleading guilty to an offence under the Health and Safety at Work etc Act 1974 for failing to protect the safety of its workers. They were prosecuted following an incident in 2018 where a shunter suffered life-changing injuries, including the amputation of an arm, when a freight train collided with the vehicle the shunter was using on a level crossing at Dollands Moor freight yard. Both the incident and the sentence show how important it is that operators have appropriate arrangements in place to ensure the safety of their employees and other rail users.

### Conclusion

1.163 Where our inspecting staff find examples of poor risk control they will take appropriate action to ensure that duty holders put in place suitable control measures. We encourage duty holders and staff to challenge matters in relation to workplace health and safety and not accept substandard conditions as the norm.



## Operational Incidents

### Overview

1.164 During 2020/21, we investigated a number of serious operational incidents involving freight services which, under slightly different circumstances, could have had catastrophic outcomes.

### Evidence and activities

1.165 We concluded our investigation into a SPAD that occurred at Loughborough South Junction on 26 March 2020 where a train comprising two locomotives and an unbraked multiple unit passed a signal by over 200 metres. Our investigations revealed that the train was travelling at a speed in excess of its braking capabilities and that the operator had failed to provide the driver with key information about the composition of the train. On 28 April 2020 we issued the operator with an improvement notice requiring them to provide suitable information, instruction and training to employees involved in the planning, preparation and operation of locomotive-hauled trains.

1.166 On 07 May 2020, a train comprising a locomotive and 22 empty aggregate wagons departed from Down Decoy Sidings, Doncaster with the brake pipe and main reservoir isolating cocks on the rear of the locomotive closed. This meant that the brake on the wagons were not operational and when the train slowed for a signal, the locomotive brakes were insufficient to adequately control the speed of the train. As a result, the train ran uncontrolled for over 2,000 metres, passing two signals at danger. Our investigation showed that there were several underlying causes of the incident. They included the use of the incident train for driver training immediately prior to departure and the existence of an historic location-specific instruction that permitted brake tests to be undertaken several hours before trains left the site. We also found that the operator's initial investigation had not considered underlying organisation and human factors that led to the incident and instead focussed on the actions taken by operational staff on the day. We provided the duty holder with written advice relating to both the incident itself and the need for more detailed incident investigation.

### Conclusion

1.167 The incidents outlined above show the potential for serious harm to result from operational incidents. We expect duty holders to have suitable arrangements to manage operational risks and will take enforcement action in cases where they fail to meet the required standard.



## Trespass at Freight Depots and Sidings

### Overview

1.168 In previous years, we have taken formal enforcement action against duty holders that have failed to take reasonably practicable measures to prevent unauthorised access to railway infrastructure under their control. During 2020/21, we continued to ensure that the freight sector managed this risk by inspecting operators' arrangements for the prevention of unauthorised access.

### Evidence and activities

1.169 We carried out a programme of proactive work to examine duty holders' arrangements to prevent unauthorised access to railway infrastructure at freight sites. Our inspections found that the duty holders inspected had both high-level and location-specific processes to assess trespass risks that included the identification and evaluation of site hazards, as well as consideration of the local environment. Furthermore, our site visits found that duty holders had implemented appropriate measures to prevent unauthorised access; this included perimeter fencing as well as the use of technology to remotely monitor site security. It was reassuring to note that a number of duty holders had taken steps to review boundary security measures when bringing operational sites back into use.



- 1.170 Unauthorised access to railway infrastructure is an industry-wide problem that requires input from a range of different stakeholders to be addressed. It was positive to observe the collaborative work undertaken over the last year by the National Freight Safety Group to develop guidance on site security for the freight sector, which included the incorporation of industry best practice on trespass risks assessment.
- 1.171 Throughout the pandemic the Network Rail Freight and National Passenger Operators Route, British Transport Police and freight operating companies worked together to identify those freight sites that may be particularly vulnerable to increased trespass activity during periods of lockdown. This intelligence enabled duty holders to put in place additional control measures where required.

## Conclusion

- 1.172 Although it was reassuring to note that the duty holders inspected had suitable arrangements in place to manage the risks associated with unauthorised access to railway infrastructure, previous incidents have shown that this is an area where the freight sector cannot afford to be complacent.
- 1.173 The law imposes clear duties on all railway duty holders to take reasonably practicable steps to prevent unauthorised access to infrastructure under their control. We therefore expect duty holders to have:
- Undertaken a suitable and sufficient risk assessment in respect of this issue; and,
  - Put in place appropriate arrangements to prevent unauthorised access.
- 1.174 Both the risk assessment and control measures should take into account the hazards on site as well as the local environment and previous history of trespass at the location.
- 1.175 Duty holders must also have suitable processes in place to monitor the effectiveness of these arrangements and take corrective action to rectify any failings that are identified.

## Transport for London

### Overview

- 1.176 The public rail network controlled by Transport for London includes London Underground, Docklands Light Railway (DLR), London Overground, Transport for London (TfL) Rail and Rail for London Infrastructure (RfLI) (Elizabeth line). COVID-19 has had a significant impact on London's railways; the mid-March 2020 lockdown resulting in travel demand in and around the capital dropping to [record low levels](#). London Underground saw the biggest drop in numbers and at its lowest point was only at 3% of normal ridership. However, TfL and London Underground continued to provide services and were able to operate over 90% of normal service provision by summer 2020.

- 1.177 We found that the overall response from TfL's railway duty holders to the pandemic was sound and robust. We observed their approach as it evolved from one characterised by rapid response in dynamic circumstances towards one seeking continuous improvement as it refined its approach as both the organisations and their customers settled into new ways of travelling and working.
- 1.178 Across their different railway systems, TfL and its operators implemented many new controls in response to the pandemic, including enhanced cleaning regimes, rapid testing units, UV light sanitising devices on escalators, and customer control arrangements to promote social distancing. Regular communications and information to the public, workforce, and union colleagues were designed to build confidence, increase clarity around precautions and initiatives, and ensure COVID-19 measures were effective. TfL have also been involved in several COVID-19 research streams that have provided useful data on the presence of COVID-19 on the LUL network. No traces were found during sampling between September 2020 and March 2021.
- 1.179 The impact of COVID-19 on TfL transport services and passenger demand makes year on year safety comparisons difficult. However, our assessment is that health and safety performance across TfL managed rail operations has remained stable during 2020/21. For TfL duty holders, our Rail Management Maturity Model (RM3) provides a broader and longer-term view of organisations' maturity in management of health and safety; and these continue to be in the range of 'standardised' and 'predictable'.

## London Underground Limited

### Overview

- 1.180 London Underground Ltd has continued to deliver a good level of safety for the travelling public and its workforce. Risk management maturity remains stable, and the organisation responded maturely to the pandemic. Continued positive leadership on health and safety with effective monitoring and assurance arrangements are essential as LUL responds to the wider challenges created by wider funding challenges created by the impact of the pandemic. It recognises the significant impact that the evolving financial pressures created by reduced fare income could have on safety if not carefully managed, and is actively developing and delivering plans to maintain the high level of risk control. We will continue to monitor their response in 2021/22, through our planned interventions such as in asset management and operations.

### Evidence and activities

- 1.181 There were no workforce fatalities during 2020/21, and together with a decrease in injuries in all classifications, this has led to an overall decrease in infrastructure worker harm. Whilst fewer workforce injuries occurred than in previous years, on average the pandemic had less impact on workforce injuries compared with customer injuries. It is likely this is because despite a large reduction in passenger numbers, worker activity remained similar to pre-pandemic levels so as to allow LUL to maintain essential train running.

- 1.182 There was a correlation between the reduction in customer journeys due to the impact of COVID-19 and the fall in the number and seriousness of injuries. Injury numbers were generally consistent with customer levels, rising after the first lockdown before falling again when the second lockdown was introduced.
- 1.183 Whilst most customer harm is made up of minor injuries, tragically there were four RIDDOR reportable fatalities involving members of the public on the London Underground network. The two passenger fatalities occurred at stations. They involved a passenger who was fatality injured when they fell between a train and the platform at Waterloo station; and a passenger who fell back from the train onto the platform at Monument station when the train doors re-opened. The remaining two fatalities occurred when members of the public suffered electric shock from live conductor rails. We continue to investigate the passenger fatality at Waterloo station and served an improvement notice regarding the absence of a suitable and sufficient risk assessment for risks at the platform train interface. LUL have now complied with this notice.
- 1.184 LUL's focus continues to be on improving customer safety at the PTI and by preventing slips, trips, and falls, particularly on stairs and escalators. Intoxication was a factor in a significant number of incidents where customers were seriously injured. During the year, we have observed LUL re-focusing its attention to adapting its approach to the changed passenger numbers and how the passengers are using the network.
- 1.185 Last year we committed to working closely with LUL as it embedded its organisational changes and used them to drive forwards safety management capability and risk control. We have done this through our proactive and reactive work, and liaison activities. The main areas of our proactive intervention work aligned with LUL's main functions: operations, renewal & enhancements, and TfL Major Projects. This year, our work was necessarily amended to reflect the challenge created by the pandemic and the need to seek assurance regarding LUL's management of the emerging risk. We adapted our approach from the normal methods of face-to-face and on-site regulation, to more frequent online virtual meetings, interviews, and collection of data. Our programme of proactive inspections was revised to reflect the challenges brought on by the pandemic, looking at LUL's response and controls in managing the risk from COVID-19, asset management, and management of safe track access.
- 1.186 Reflecting what we said last year regarding the challenges associated with railway assets, we began a programme of planned proactive inspections focusing on LUL's management of assets. This work is covering three principal asset areas in LUL: track, power, and civils & structures. This is the beginning of a multiple year programme to better understand LUL's asset management arrangements, and capability to manage any changes in risk profile as it responds to its ageing asset and emerging financial challenges. This multi-layered approach involves our safety inspection teams focusing on how LUL is using its data on a day-to-day basis to manage worker and passenger risk, and our engineers reviewing LUL's high level asset management strategy. Based on initial information and evidence collected via virtual means, our RM3 analysis demonstrates that the three disciplines are maintaining a standardised level of management maturity. Our work has identified three main themes going forwards: ageing assets and impact of obsolescence; asset performance; and prioritisation.

1.187 In comparison to the mainline sector, LUL generally uses overnight 'engineering hours' to maintain its infrastructure when passenger services are not running. As part of our review of how LUL monitors the effectiveness of its risk control arrangements, we undertook a programme of office and site-based inspections. Positively, LUL has good medium-to-long term projects to improve the reliability of risk controls, some of which will require further funding to reap the safety benefits offered by technology. In the shorter term, we identified several areas where LUL could enhance its arrangements to provide assurance that its risk control measures are effectively implemented. We will continue to work closely with LUL to ensure these risks are suitably and sufficiently controlled.

1.188 We made several enquiries during the year into significant incidents across the LUL network. Whilst not all resulted in injury to workers or customers, each provided us with the opportunity to assess legal compliance and how LUL applied its safety management system to control risk in a systematic manner. Common observations across most incidents related to how LUL used risk assessment to inform the controls and as a tool to enable effective monitoring of successful implementation. Where applicable, we made observations or recommendations and, together with asset management, will continue our focus on LUL's monitoring, audit, and review arrangements in 2021/22.

## Conclusion

1.189 Our supervisory activity continues to provide evidence that LUL's health and safety management system has the capability to manage risk, and that overall it continues to implement its requirements to a satisfactory standard. However, after a significant period of change over the previous five years, the current operating and financial challenges mean that there is a high chance of further significant change ahead. We identified areas of strength but also areas that indicate that LUL needs to take action to ensure that further change does not negatively impact on its capability to control health and safety risk. LUL should take action to ensure that any developments or planned changes to risk control arrangements are subject to robust risk analysis, and that granularity of risk controls and processes are not lost due to lack of oversight.



## Rail for London Infrastructure / Crossrail / Elizabeth Line

### Overview

- 1.190 Rail for London Infrastructure Limited (RFLI) assumed the role of Infrastructure Manager under the Railways and Other Guided Transport System (Safety) Regulations 2006 (ROGS) for the Elizabeth Line central operating section (COS) on 27 March 2021. This followed the completion of testing and commissioning and allowed RFLI to permit trial running to commence in the central operating section between Paddington and Liverpool Street stations, in order to fully test the timetable while final works at the stations are completed.
- 1.191 We have enjoyed professional and collaborative working with the Crossrail project team and key stakeholders. We look to continue this approach as the project progresses through trial running into trial operations when operational plans will be tested prior to passenger services.

### Evidence and activities

- 1.192 During the year, we continued to engage with the Crossrail project monitoring its preparatory plans to hand infrastructure responsibility to RFLI. We also ensured that RFLI received sufficient information to allow it to discharge its infrastructure manager responsibilities.
- 1.193 A Controlled Introduction Period at the start of trial running allowed RFLI to put in place asset maintenance compliance plans. This was a period during which no trains ran, which had the added benefit of permitting RFLI maintainers to carry out further familiarisation and to test RFLI processes and procedures in a live but safer environment prior to starting timetabled train operation.
- 1.194 We found that RFLI had robust arrangements in place to complete trial running, which will be followed by trial operations before passenger services. We noted that as a newly operational infrastructure manager RFLI will need to retain focus on how it delivers its safety management system during trial running. It also needs to ensure it continues to control risk as the outstanding works are completed in the COS, thus achieving full functionality to allow trial operations to commence.

### Conclusion

- 1.195 TfL has successfully transformed the Crossrail project from a construction site to an operational railway. The safe and successful delivery of trial running is the next stage in the introduction of passenger services. There are key areas for us to monitor during 2021/22 in assessing how RFLI is implementing its safety management system. We will be focusing on the interfaces between all the key stakeholders: MTR, RFLI, LUL and NR through regular liaison and proactive inspection targeting workforce safety and emergency preparedness. In tandem, we will continue our work authorising specific sub systems.

## TfL Rail (MTR Corporation)

### Overview

1.196 Our intervention work found that TfL Rail franchisee MTR Corporation (MTR) continues to demonstrate a positive and systematic approach to the management of health and safety. A particular strength has been MTR's well established change management arrangements as it prepared for trial running on the Elizabeth Line.

### Evidence and activities

1.197 Our main inspection work with MTR Corporation focused on its change management arrangements. This targeted two areas: the arrangements to gain significant experience of operating in the Central Operating Section (COS) during testing and commissioning work; and preparation for the next stage of delivering the COS into passenger service. We found evidence that the change management arrangements were effective at identifying change requirements, and that these were properly scoped and resourced to allow MTR to deliver its change procedures. This approach has allowed MTR to be prepared and able to manage risk as it enters the trial running phase.

1.198 Until the Elizabeth Line COS is fully operational, MTR continues to operate passenger services outside the COS, between London and Shenfield in the east and Reading in the west. After a series of lower risk SPADs on the TfL Rail network during 2019-20, we reviewed MTR's incident investigation and management review arrangements. We found that MTR were taking a proactive approach to identify lessons, quickly initiating proportionate enquiries to identify key learning and, in this instance, initiating a targeted SPAD risk reduction strategy.

## London Overground – Arriva Rail London (ARL)

### Overview

1.199 Our intervention activity with ARL concluded that its safety management system has dealt well with the varied challenges it has faced during this year, including management of COVID-19 risk and impact on its operations. ARL understands the next steps to improve management of risk and has plans in place to deliver these during 2021.

### Evidence and activities

1.200 Our activities in 2020/21 focused on ARL's operational arrangements, targeting its driver management capabilities, risk control at the passenger train interface, and response to the pandemic. ARL's organisational changes and new posts have had a positive impact and should enable ARL to continue with further improvements in safety management. Many of the operational improvements we observed during our inspections were already in place, having been identified by an enhanced operations standards team. The risk-based approach to its reviews provided us with confidence in ARL's continued ability to further improve the competence management system and in turn the driver management process.



1.201 ARL responded decisively to the pandemic with clear arrangements to reduce risk of exposure and infection. The impact of COVID-19 has delayed the planned move of the control centre to Palestra as have planned changes to operational roles within the control room.

## Docklands Light Railway

### Overview

1.202 Docklands Light Railway (DLR) Limited and its franchisee Keolis Amey Docklands (KAD) continue to deliver stable health and safety performance which is characterised by an absence of significant incidents involving staff or customers. The pandemic fundamentally changed passenger demand on the system leading to DLRL introducing several timetable alterations to reflect these changes.

### Evidence and activities

1.203 Engagement with DLRL and operator KAD continues to be proactive and collaborative. Our activities focused on three key risk areas during the year: monitoring KAD's response to COVID-19, arrangements for introducing new assets, and actions for improving the detection of, and response to, hazards on the track ahead of driverless trains. In each case we found sound reasonable arrangements in place to understand the risk, explore potential solutions, and develop plans to deliver change. We continue to monitor the progress of the various works, with focus on safety verification and change management capability.

## Tramways and Light Rail

### Overview

1.204 Like the rest of the rail sector, the tram sector has had a particularly challenging year dealing with a pandemic that has affected us all. As a result, Great Britain's tramways and light rail systems saw a significant decline in passenger numbers over the year, but a relatively small reduction in overall kilometres operated. All tramways reacted quickly to implement reasonably practicable control measures to enable social distancing and to keep both members of the public and employees safe.

1.205 The sector continues to move forward with implementation of the remaining open recommendations made by RAIB following the overturning of a tram at Sandilands in 2016. Development of plans to fully implement recommendation 3 (prevention of over-speed) and 4 (driver attentiveness) has been steady with all tramways now taking forward clear plans to implement these important systems. We continue to monitor progress closely. Our own investigation under health and safety legislation continues and in line with our policy we await the outcome of the inquest before making a final decision on potential prosecution.

1.206 The LRSSB has continued to establish itself as an important body, providing support and guidance to the sector's owners, operators, maintainers, and infrastructure managers. The LRSSB is now producing significant pieces of guidance to enable tramways to develop an improved understanding of their risk profile.

## Evidence and activities

1.207 There are seven tram systems in Great Britain: Blackpool Tramway, Edinburgh Trams, Manchester Metrolink, London Tramlink, Nottingham Express Transit, Sheffield Supertram and West Midlands Metro. Outside London there are also two light rail systems: the Tyne and Wear Metro system and the Strathclyde Partnership for Transport Subway in Glasgow. LRSSB is responsible for providing support and guidance to the light rail industry, driving continuous improvement in safety related matters. Throughout the pandemic, light rail systems provided key workers with a crucial means of transport. These systems will continue to provide a reliable and safe means of moving people around the towns and cities they serve as we move slowly back to more normal life. Plans continue to be developed to extend the network in several cities.

1.208 Once again, the tram sector reported no workforce fatalities in connection with their operations in 2020/21. There have also been no passenger fatalities on board trams since 2016. We made several initial enquiries into incidents on various tram networks. These have included signals passed at stop, conflicting movements, collisions with vehicles and pedestrians, minor tram derailments and electrical incidents. Following these enquiries, where necessary, we required or recommended improvements to be made to either the management arrangements or control measures themselves. We followed these up to ensure appropriate action was taken to close out actions and to build on continuous improvement principles.

1.209 Our RM3 assessment of the sector across a range of criteria indicated tramway systems are normally operating in the 'managed' to 'standardised' ranges. However, there were discrete areas such as RIDDOR reporting where the industry dipped into the 'ad hoc' range. Accordingly, action plans have been required of the relevant duty holders, which we will monitor closely.



- 1.210 During the year, we identified that whilst tramway systems have arrangements in place for internal reporting of accidents and dangerous occurrences, their arrangements to comply with the requirements of RIDDOR were weak. This resulted in widespread non-compliance in reporting some dangerous occurrence categories. We required each tramway operator to take action to address identified issues. Looking forwards, we are engaging with the LRSSB, acting on behalf of the tram networks, to identify an efficient solution to deliver historical RIDDOR data for our statistical purposes, and explore the potential to use the tram accident and incident reporting (TAIR) system as a mechanism to comply with RIDDOR duties in an efficient manner.
- 1.211 The sector has now embedded TAIR and tramways are using it as their primary database and as a way of increasing risk profiling accuracy. The LRSSB are developing plans to increase TAIR's capability, to add further safety related modules, including generic risk assessments and horizon scanning.
- 1.212 The LRSSB continues to further develop and evolve its role despite the effects of the pandemic. We have established formal liaison with the LRSSB to both monitor its work and support its significant initiatives. These initiatives include the further development of TAIR; and publication of several industry guidance documents including the publication of important guidance on driver attentiveness and over-speed control. This provides invaluable assistance to the sector as it continues to implement the final components of the Sandilands recommendations. We also worked with the LRSSB to deliver a briefing on the application of RM3 to the tram sector. This will enable duty holders to assess their own management maturity and to compare their relative strengths and weaknesses within the industry.
- 1.213 Tramway systems have now embedded the LRSSB developed safety risk model into their operations, and LRSSB continues to refine and update the model following data analysis, industry comment, and introduction of new control measures. The model continues to indicate that the top hazardous events relate to tram collisions with people and road vehicles; passenger / public slip, trip and fall incidents; and overturning of a tram. The precursor analysis output supports the priorities the sector has placed on developing technological solutions to improve the management of driver attentiveness and speed control at high-risk locations. We continue to support the delivery of this work, and during 2021/22 we will engage with each tramway to examine how operators have integrated the risk model into their safety management arrangements, and how they are using the model to inform their identification of safety priorities.
- 1.214 In line with the Chief Inspector's themes, the sector continues to explore the potential of technology to improve risk control reliability. It has taken further steps to trial and implement technologies to improve the reliability of line-of-sight driving such as the Simove continuous speed monitoring solution at Manchester Metrolink and devices to physically prevent overspeed on Croydon Tramlink. Tramways are beginning to install and manage these systems. The tram industry has a genuine determination to continue to improve safety systems and has demonstrated clear improvements in areas such as fatigue management. However, more is needed, and we will continue to push the industry forward and ensure it demonstrates effective safety management arrangements.
- 1.215 Although the COVID-19 pandemic had a significant impact on the way we were able to conduct our work activities during 2020/21, we continued to deliver a systematic programme of supervision of the sector. Informed by our strategic chapter, risk assessment and risk ranking process, and LRSSB's safety risk model, this work included themed inspection and investigation activity targeting pedestrian safety, unauthorised access to the tramway, passenger / tram interface at platforms, and management of construction activities. These interventions targeted the effectiveness of individual duty holders' safety management arrangements.

- 1.216 The Tramways and Light Rail Team carried out assurance work with each tram operator covering its response to the pandemic. This included the controls that were implemented following a robust risk assessment process incorporating government advice and guidelines. The team found that all tramways had reacted quickly and appropriately to the pandemic, placing the safety of members of the public and their own staff as the top priority in this difficult period. We continue to cover these arrangements during liaison meetings and reacting to any concerns as they arise. The longer-term impact of the pandemic on the sector remains a concern, especially from a financial perspective. The industry must ensure that any changes made follow a systematic and clear process, safety considerations are understood and any significant risks controlled.
- 1.217 Following our investigation into the death of a Nexus employee who had been working at height on high voltage overhead cables, Nexus were fined £1.5 million for failing to ensure the safety of their staff. Our investigation found that safety critical procedures were ignored and that lessons were not learned over several years.

## Conclusion

- 1.218 The sector continues to respond positively to the challenges of the Sandilands recommendations and the drive to improve the reliability of line-of-sight operation. Our assurance work over the year indicates the sector has systems in place to adequately manage risk. Tram networks, aided by the LRSSB and its production of guidance and support, along with a focus on continuous improvement, have demonstrated RM3 management maturity levels around 'managed' to 'standardised' levels of maturity.
- 1.219 However, there were specific areas where arrangements were less well managed, particularly around RIDDOR reporting and the assessment of the risk of unauthorised access to segregated areas of tramways. This demonstrates the need for tramways to focus on identifying areas of weakness in the safety management systems and address these across the organisation. We will continue to assess management system maturity using the RM3 tool over the forthcoming year.



## Heritage Railways

### Management maturity

#### Overview

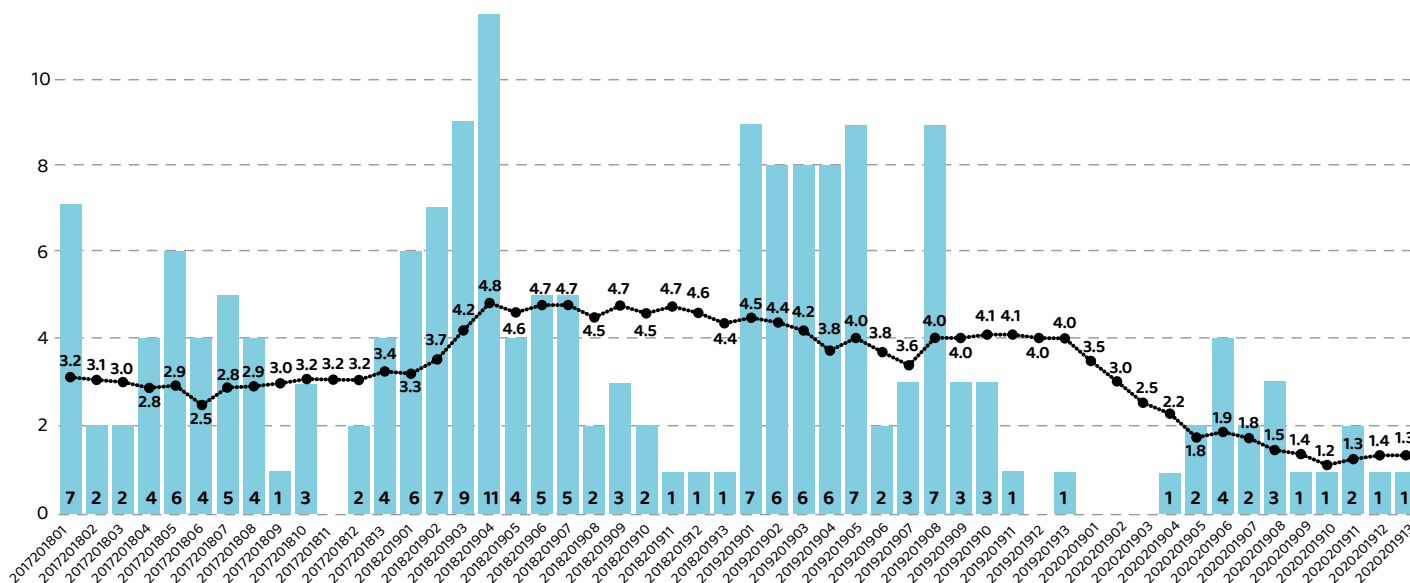
- 1.220 Safety management systems form the foundation of good risk management for non-mainline heritage railways and continue to be the focus of our inspection and investigation activity. Strong but proportionate safety management systems ensure that risk is controlled and will help railways safely fully reintroduce services as lockdowns ease.
- 1.221 Heritage railway operators continue to demonstrate enthusiasm to manage their operations safely. The sector showed itself to be agile and quick-moving in interpreting ORR and Heritage Railway Association (HRA) advice and implementing measures at the onset of the pandemic. Many took the opportunity during reduced periods of activity created by the lockdowns to review their capability and develop plans to consolidate and improve.
- 1.222 The pandemic impacted on our inspection activity, as we moved from site-based to largely remote inspection. This enabled a shift in focus away from operational matters and towards railways' arrangements for asset management, workshop activity and staff competence. Whilst difficult to compare to previous years, the industry's capability has remained relatively stable, with a real willingness to develop solutions to keep staff and visitors safe upon return after the first lockdown. We published guidance to assist heritage railways as they prepared to return to operation, and the HRA did sterling work supporting the sector to develop their capability and prepare for re-opening.
- 1.223 Evidence from our inspections and investigations indicates, however, that the capability and maturity of the sector remains very broad. Using a variety of intelligence sources, our work generally targets the areas which are likely to have poorer risk control measures in place. As a result, a number of railways we had contact with could not demonstrate, without significant work, that they were controlling risk in a systematic way and this is reflected in a downward movement in our composite RM3 assessment. Even during lockdown periods, we had to intervene where we discovered unacceptable risk, leading to several railways delaying re-opening, or suspending services.

#### Evidence and activities

- 1.224 There were no heritage railway caused workforce fatalities in 2020/21, now making it nine years since a workforce fatality. Reflecting the significant reduction in operational activity due to the pandemic, reported injuries fell resulting in the FWI dropping to 0.68, from 2.18 in the previous year. Most injuries were related to workshop and maintenance type activities, often due to non-compliance with basic safety requirements. As in previous years there were no passenger fatalities and a very low number of RIDDOR related reports. A member of the public died in an unfortunate accident after falling on railway infrastructure at the rear of her house when the railway was non-operational. We served an improvement notice due to the lack of measures preventing unauthorised access.

1.225 The number of RIDDOR reported dangerous occurrences across the heritage sector also fell to historically low levels, with the majority occurring during non-passenger train movements. Although none resulted in serious consequences, it was not uncommon for the incidents to result in damage to rolling stock or infrastructure. SPADS and derailments continued to account for around half of all reported dangerous occurrences.

**Figure 8 – Number of Dangerous Occurrences 2017/18 to 2020/21, and MAA (blue line)**



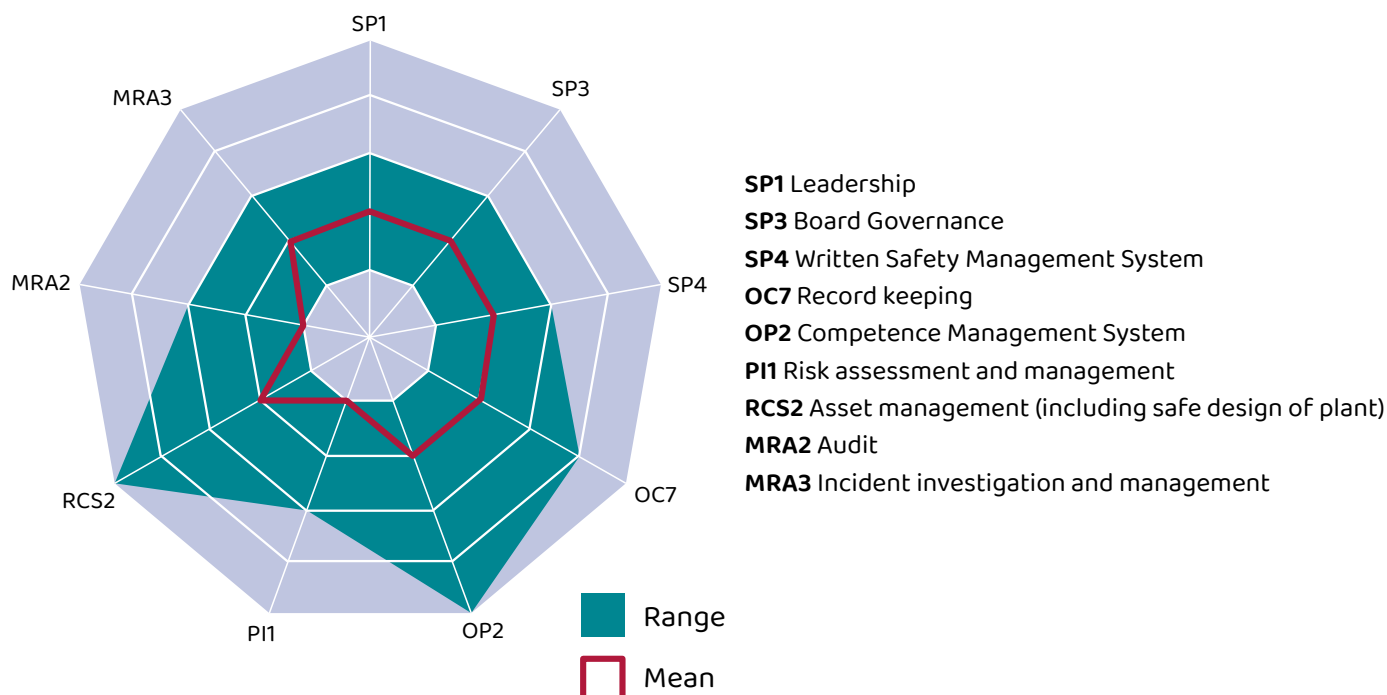
Source: ORR

1.226 The role of a heritage railway's board of directors and senior leaders plays an important part in setting the expectations of the railway. The quality of board oversight and leadership in heritage railways has the potential to be both positive and negative. In some instances, we observed that this could have a detrimental impact on railway safety performance. In several railways, we observed that a variety of issues inside railway organisations, such as internal/external conflict, governance or leadership actions were having a direct impact on safety. Such matters create a distraction from the important task of running the railway safely. Whilst we aim to not become involved in such matters, and instead focus on risk control, we recognise the importance of effective leadership and strong governance and will provide advice if relevant. For this reason, we placed this at the centre of our new RM3 Topic Set 1 for Heritage Railways. This contains specific guidance on governance, and we continue to encourage the HRA as it builds its leadership role to the sector.

1.227 Building on our work and stated commitments in 2019-20, we continue to promote RM3 as part of our intervention programme. We published RM3 2019 Topic Set 1 for Heritage Railways. This provides a focused and more relevant set of RM3 criteria for heritage railways and is intended to help individual railways understand and develop their safety management capability in 10 key areas.

1.228 Our assessment of the sector's overall risk management maturity in 2020/21 continues to show a wide range of risk management maturity. Reflecting that our activities continue to expand the number of railway operators we encounter, we developed our 2019-20 findings to include this year's conclusions. Figure 9 shows our RM3 assessment from our inspection and investigation activity, indicating the maximum and minimum levels determined for each key heritage criterion. Our assessment found that most operators are operating in the 'ad-hoc' or 'managed' level; with the written health and safety management system criterion (SP4) in the 'ad-hoc' to 'managed' range.

**Figure 9 – A composite RM3 assessment of the heritage railway sector’s risk management maturity in the two-year period to end 2020/21**



Source: ORR

1.229 Heritage railway operators' safety management systems (SMS) varied from good to poor, occasionally making no discernible impact on the levels of risk control achieved. Deficient or incomplete SMSs were leading to lack of control of certain risks. Whilst inspections identified good practice and effective risk systems, we also identified circumstances that required railways to undertake significant review to regularise their SMS after our intervention and, on occasion, before the railway could re-commence operations. It is positive that heritage railways continue to show enthusiasm to learn and manage their operations safely and respond to our advice appropriately. However, although our sample size was very much smaller than in previous years, our findings do not indicate that the sector has made any significant progress to address highlighted failings identified in previous years. This suggests the sector does not yet have the capability to identify its own failings and to act to rectify them.

1.230 In last year's report we stated we would continue to look at the management of competency in our work. We have found increasing awareness across the sector of the importance of only utilising demonstrably competent persons to managing risk. The HRA has led the way, introducing several initiatives to support railways in developing staff competency, and to develop assessors to drive improvements in individual railways. This is positive and we found good practice during our inspections. Unfortunately, we also continue to find some railways with poor or very poor arrangements to demonstrate how they ensure that their safety critical staff are competent so continued vigilance is necessary.

1.231 An emerging theme is the increasing challenge that railways face in ensuring railway civil engineering assets are safe. Although the pandemic forced us to defer a programme of inspections targeting structures, our limited interventions found SMS weaknesses in several railways that resulted in them being unable to account for the condition of their structures. This led to operations being suspended, or their re-introduction delayed, sometimes for a significant period. In one instance, we had to take enforcement action regarding the management of structures due to the scale of risk and absence of suitable SMS arrangements.

- 1.232 The sector continues to respond positively to the challenge of ensuring Mk I carriages are in suitable condition for operation. We noted in last year's report that we expected HRA to make significant progress with its Code of Practice for carriage maintenance. Unfortunately this has not happened, in part due to the impact of the pandemic, and we expect HRA to make significant progress during 2021/22. More variable was the approach to traction maintenance standards and fitter competence, particularly in connection with diesel traction. As more mainline diesel locomotives and multiple units enter preservation, additional work is required in this area to ensure that railways are clear as to what is required and how they implement those requirements.
- 1.233 Two prohibition notices were served relating to inadequate machinery guarding and two improvement notices relating to unauthorised access, and management of structures during 2020/21.





1.234 Recognising the important role that both paid staff and volunteers play at all levels in securing safety within heritage railways, we continue to take specific action to help the sector maintain and improve its management of risk. During 2020/21 we have:

- Delivered a series of mutual improvement classes on Leadership and Governance.
- After extensive consultation, expanded and published specific targeted RM3 topic set tailored to the heritage railway environment – RM3 2019 Topic Set 1 for Heritage Railways.
- Attended and presented at a variety of HRA and local railway safety events and safety / technical meetings – both virtually and in person.
- Continued engagement with HRA's Operating and Safety Committee; providing input to its core operating principles and guidance development activities.
- Supported HRA's work to establish a Heritage Railways Safety and Standards Board.
- Provided sector specific guidance on restarting operations and managing risks associated with COVID-19, to help them recover and prepare for the future.

1.235 HRA continues to take action to develop its capability to provide safety leadership and support to the heritage sector. At the end of 2019-20 it published a five-year strategy for growth. A key part of that strategy was to investigate the creation of a safety & standards-type body to drive forwards increasingly effective cooperation and information sharing, with the aim to improve the management of safety risk across the whole sector. Our findings this year reinforce the importance of this work as a key part of helping the sector build resilience for the future. As we stated last year, we continue to actively support this work, and we are now seeing positive action with the creation of an outline business plan, timeline, and commitment from several of the larger heritage railways. Funding remains a significant factor, but we hope to see movement over the next 12 months.

## Conclusion

1.236 COVID-19 has had a serious impact on heritage railways during 2020/21 and this impact is likely to continue well into 2021/22 and beyond. Many railways treated the non-passenger operating periods as an opportunity to review and build resilience and capability, often delivering significant infrastructure upgrades. Others were less fortunate, and some failed.

1.237 Our inspection work was also significantly impacted by the pandemic, leading to different ways of working, but this did not stop us from operating and delivering intervention activity remotely, and as lockdown restrictions allowed these were able to take place on-site.

1.238 The heritage railway sector is a diverse collection of different types of railway with very different scales of operation. Our findings continue to indicate that many railways face significant challenges to ensure they remain safe for passengers, staff and volunteers in the 21st Century. Fundamental is each railway developing the capability of its SMS to ensure delivery of good risk control, and not being complacent. We expect railway boards and senior leaders to make this a priority as they move forwards, and as the Chief Inspector highlights in his foreword, support and improve the culture at the frontline.

- 1.239 The SMS is the cornerstone for risk management. The SMS should assist a railway to operate safely so it must set out how the railway manages risk and that this is then delivered. Whilst we found some good practice, we provided significant advice to several railways on areas to support better risk management.
- 1.240 Finally, the HRA has done sterling work supporting the sector in tackling the challenges it faced concerning COVID-19, and continued to provide training, learning, and information sharing opportunities to its members. We expect the development of a heritage safety and standards body will introduce a new level of capability to the sector as it focuses on its future resilience and sustainability. In the interim, we encourage the continued development of individual railways attracting new members and supporting each other through peer-to-peer learning and support.

## The safety of the Channel Tunnel

- 1.241 As a result of the UK leaving the European Union, the way that health and safety regulation of the Channel Tunnel is carried out changed with effect from 1 January 2021. The role of the National Safety Authority (NSA) for the French half of the Tunnel passed from the Channel Tunnel Intergovernmental Commission (IGC) to the French safety regulator, Établissement Public de Sécurité Ferroviaire (EPSF). For the UK half of the Tunnel, this role will continue to be carried out by the IGC until a new Binational Regulation is introduced, at which time we will become the NSA. The IGC will continue to carry out its monitoring and supervision role under the Treaty of Canterbury.
- 1.242 To assist the IGC in its activities, we continue to provide leadership, expert advice and secretariat support to the IGC and Channel Tunnel Safety Authority (CTSA), applying the key principles of our health and safety vision and strategy for the railways in Great Britain to the Channel Tunnel. Our inspectors are appointed, alongside their French counterparts, to lead and deliver the CTSA and NSA inspection plans, which aim to assure that Eurotunnel's and train operators' management systems are capable of managing the specific risks associated with Channel Tunnel operations.
- 1.243 During 2020/21, the IGC and CTSA have continued to regulate the users of the Channel Tunnel in a way that facilitates the safe operation and growth of cross-Channel railway traffic. COVID-19 has continued to have a particularly severe impact on levels of passenger and freight traffic using the Tunnel and on the revenues of all Channel Tunnel operators. The arrangements for ensuring safety during the recovery from the pandemic will be a focus of NSA and CTSA activity during 2021/22.
- 1.244 Our core priority in 2020/21 has continued to be the ongoing monitoring of Eurotunnel's approach to safety-related issues in respect of the ElecLink project. Our investment of significant resource, including external experts, to scrutinise the project's approach to risk management, enabled sufficient assurance to be provided by both delegations of the CTSA to enable IGC to reinstate consent for this project to continue, and the installation of the interconnector to commence, on 10 December 2020. This consent was conditional on several outstanding elements being finalised and the CTSA and its experts have worked closely with Eurotunnel to deliver this.
- 1.245 Other activities have included the IGC authorisations of a number of new wagons to be used through the Channel Tunnel, and the IGC granting its consent for testing of the ElecLink converter stations on the UK and French Eurotunnel terminals. The CTSA also conducted, with inspectors from ORR and EPSF, a safety leadership inspection of Eurotunnel's leadership and governance arrangements for managing safety at ground level. The key outcomes from this work will be used to inform future regulatory activities. [The IGC produces its own annual safety reports which are published on its website.](#)

## Our safety policy and strategy work

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

- Published a refreshed version of our [Health and Safety Regulatory Strategy](#), which explains our role, vision and approach to regulation with clearer links to our strategic risk chapters.
- Produced guidance for railway operators on managing compliance with health and safety legislation during the COVID-19 pandemic. This included specific guidance on the emergency measures introduced by the European Commission to extend the deadlines for periodic medicals for licensed train drivers, and guidance on meeting the requirements for monitoring medical fitness during coronavirus lockdown restrictions.
- Developed new guidance to support level crossing risk assessment and produced case studies to illustrate how the guidance can be applied in practice. Our “Principles for Managing Level Crossing Safety” developed with the input from a stakeholder steering group, and a public consultation that included well-attended webinar discussions. The guidance, case studies and new web content was made available in June 2021.
- Carried out a survey of stakeholders on the impact of the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended) (ROGs) to provide evidence for a Post Implementation Review (PIR) of ROGs. Our report on the survey findings will inform a Department for Transport report on ROGS, which is due in August 2021.



- Sought views, via a consultation exercise, on our proposed revision of guidance on the application of the Railway Safety Regulations 1999 (RSR 99) to Mark 1 type and hinged door rolling stock when operated on railway infrastructure where line speed exceeds 40kph. Our findings and guidance will be published in the summer of 2021.
- Published brief guides on the impact of the end of the EU Exit transition period on railway safety legislation and train driving licences. We have been working through our existing guidance on railway safety legislation to update it in line with the post-EU exit legal framework. Updated guidance will be published throughout the coming year.
- In preparation for the end of a temporary period during which EU train driving licences continue to be recognised in the UK following EU exit, we have been developing a policy on train driving licences for drivers of cross-border services through the Channel Tunnel. We have also clarified our policy on the renewal of train driving licences, which expire after 10 years. Guidance on both topics will be published in the summer of 2021.

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



- 1.248 We worked collaboratively with train operators to enable the processing of applications for new mainline train drivers to be licensed under the Train Driving Licences and Certificates Regulations 2010 (TDLCR), and to ensure that the national register of licensed train drivers remains up to date. 736 applications for new train driving licences were processed between 1 April 2020 and 31 March 2021. We also recognised a further nine doctors, eight psychologists and two training and examination centres, and added them to our registers as required under TDLCR.
- 1.249 We continued to chair the Railway Industry Health and Safety Committee, which brings together representatives of employers, employees, passengers, and government bodies to discuss and contribute to health and safety matters, and we worked with other health and safety regulators to share best practice.
- 1.250 We continue to improve the way we use and analyse industry data and intelligence from our investigations and inspections to help us plan our interventions better. This allows us to be a truly evidence-based, proportionate and transparent regulator, using data and information to determine risk priorities and trends and focus our resources on priority areas where we can have the most influence and make the most difference. During the year our data and intelligence project developed a new inspection reporting template which will make it easier for us to search and analyse our reports for key findings or themes. We have also been working closely with RSSB, seconding one of our members of staff to RSSB to see what more both organisations can learn from the huge amount of data and intelligence gathered from the industry. Finally, we continue to refine and review our annual Risk Assessment and Risk Ranking process, which provides frontline teams with a prioritised list of industry hazards and risks for them to use in determining their intervention plans for the next work year.
- 1.251 Our RM3 Governance Board, comprising of ORR and rail industry sector representatives, has overseen key engagement with stakeholders and the delivery of virtual workshops with trade unions and tramway operators. With their help, we have initiated a review of RM3 2019 through a user survey to allow us to evaluate the usefulness of the model, and continue to develop it to support the industry in achieving excellence in health and safety risk management. We also continue to develop e-learning packages to support the use of RM3 in the assessment of maturity and effectiveness of safety management systems.
- 1.252 When we were developing our latest version of the Risk Management Maturity Model - RM3 2019 – we recognised the potential for supporting topic sets that would take the RM3 concept and apply it in a more targeted area. In 2020, we finalised this concept and applied it within the heritage rail sector. By recognising the needs of smaller organisations or those just starting out on the RM3 journey are different, we have developed, with input from key stakeholders, the RM3 2019 Topic Set 1 for Heritage Railways. The topic set provides more focused RM3 descriptors over a much smaller and more readily applicable set of criteria than the 26 found in the full RM3 2019. The intent is to provide descriptors that reflect the heritage sector's particular operating characteristics and risk profile.

## Permissioning

### Safety Certificates and Authorisations

- 1.253 Safety Certificates are issued to duty holders where the transport system operates at speeds above 25mph or 40kph. A Mainline safety certificate comes in two parts. Part A sets out the general safety management arrangements. Part B relates to one transport system and it includes details of how the specific transport system requiring a safety certificate is operated safely.
- 1.254 Non-mainline certificates come in one part. The requirements are broadly similar to a mainline application. They are only valid in the country of issue.
- 1.255 Mainline and non-mainline safety authorisations are specific to the relevant infrastructure. The main difference in applying for a mainline or non-mainline authorisation is the size and nature of the infrastructure being managed.
- 1.256 The number of safety certificates and safety authorisations issued during 2020/21 are shown below:

Certificate/Authorisation type	New	Updated / Amended	Renewed	Total
Mainline Part A Safety Certificate	4	0	6	10
Mainline Part B Safety Certificate	4	10*	6	20*
Mainline Safety Authorisation	1	1	5	7
Non-mainline Safety Certificate	0	1	1	2
Non-mainline Safety Authorisation	0	1	1	2

\* Mainline Part B Safety Certificates were updated for Transport Undertakings who operate over infrastructure known as the "Core Valley Lines" in South Wales. This is due to the infrastructure, now being managed by Amey Infrastructure Wales Limited as opposed to Network Rail Infrastructure Limited.

### Exemptions

- 1.257 We assessed and issued an exemption from Regulation 3 of The Railway Safety Regulations 1999 to Chiltern Railway Company Limited and Network Rail Infrastructure Limited. The exemption is both to enable Chiltern Railways rolling stock to operate if the existing Thales manufactured SELCAB ATP system (where fitted) is not available due to an irreparable failure, and to allow the fitment and operation of enhanced Mk4 Train Protection and Warning System (TPWS) onboard Chiltern Railways rolling stock and the route infrastructure to replace the ATP equipment. This will also include the upgrading and expansion of TPWS that is already fitted on the infrastructure and other trains to meet current Railway Standards.
- 1.258 An exemption application under The Railway Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) Regulation 30(1) was assessed and issued to Alstom Transport UK Limited. This exempts them from the requirements in Regulation 4(1)(b) to hold a current safety certificate and Regulation 4(2)(b) of the Regulations to hold a current safety authorisation in respect of testing and commissioning work on the Central Operating Section of the Crossrail railway (Elizabeth line) between Westbourne Park in the west and Pudding Mill Lane portal in the east, plus a south eastern section from the Stepney Green junction to Abbey Wood station.

## Section 2 – Rail Accident Investigation Branch

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- 2.1 The Rail Accident Investigation Branch (RAIB) is the independent investigation body for accidents and incidents on UK mainline, metro, tram and heritage railways.
- 2.2 The stated aim of RAIB is to independently investigate accidents to improve railway safety and inform the industry and the public. RAIB is not a prosecuting body and does not apportion blame or liability in its reports.
- 2.3 Where it identifies an opportunity to improve railway safety, RAIB will make a recommendation. Our role is to pass RAIB recommendations to the industry bodies we think are best placed to act upon them and to report actions taken back to RAIB.
- 2.4 Since RAIB was established in 2006 it has issued approximately 1,600 recommendations.

### Our relationship with RAIB

- 2.5 We have a good working relationship with RAIB, helping us share our understanding of incidents, key learning from them and areas where we share concerns. Regular meetings are held between RAIB's Chief Inspector and our Chief Executive as well as quarterly working level meetings. RAIB attend Railway Industry Health and Safety Advisory Committee ([RIHSAC](#)) meetings.

### Reporting to RAIB

- 2.6 We have a statutory obligation to report to RAIB on the action being taken to address a recommendation within 12 months of publication of a report. We also provide updates to RAIB when we consider work done by a duty holder has implemented a recommendation.
- 2.7 During 2020/21, we reported to RAIB on 127 recommendations, with 86 having been implemented; 17 reported as implementation ongoing and 24 as progressing. No recommendations were reported as having had an insufficient response and one was directed at another public body outside our jurisdiction. In 2020/21, we received 16 reports, which included a total of 61 new recommendations.
- 2.8 In its 2020 Annual Report, RAIB identified four recommendations where they had concerns a duty holder's response did not sufficiently address a recommendation.
- 2.9 There are three recommendations on us that have not yet been reported as implemented, two of which are related to changing our level crossing guidance to reflect any changes to signage requirements following legislative changes by DfT. Following DfT's decision not to pursue reform of level crossings legislation, we nevertheless intend to improve our guidance and processes around the existing regulations in 2021/22, which is expected to address these two recommendations.
- 2.10 The third recommendation on us was published in RAIB's report into the death of a person, who had impaired vision, being hit by a passenger train after falling from platform 1 at Eden Park station. The report published on 19 February 2021, recommended we amend our Accessible

Travel Policy (ATP) Guidance for station operators, to ensure operators publish information on whether station platforms they manage are fitted with tactile surfaces. We welcomed RAIB's recommendation to use our ATP Guidance as a vehicle to improve the availability of information on tactile surface at stations across the UK and we will take into account this recommendation in the next iteration of our ATP Guidance.

## Safety Digests

2.11 As well as full investigation reports, RAIB also publishes Safety Digests. Safety Digests are a useful alternative to full RAIB reports as they are produced more quickly after an incident and are focused on identifying safety learning rather than making recommendations. In 2020/21, RAIB issued seven safety digests.

## Sandilands investigation

2.12 The investigation into the overturning of a tram at Sandilands junction on the Croydon Tramlink network on 9 November 2016 was one of the most significant undertaken by RAIB since it was established.

2.13 The [investigation report](#) was published on 7 December 2017 and made 15 recommendations upon the tram industry and ORR. In line with our legal obligations, we reported progress against these recommendations within 12 months of publication (on 4 December 2018).

2.14 We have since provided two further significant updates to RAIB on industry progress to implement the recommendations and we continue to monitor progress. To date, both of the recommendations placed on us have been reported as implemented, as have seven of the 13 recommendations addressed to London Trams/Tram Operations Ltd which owns and operates the Croydon network. The seven recommendations directed to all tram owners, operators and infrastructure managers in the UK are being progressed and we note the positive collaboration that has taken place to address those that require cross-industry action, culminating in the establishment of the LRSSB.

## RAIB summary of learning documents

2.15 Alongside its [2019 Annual Report](#), RAIB issued six summary of learning documents covering key learning in areas where RAIB has done the greatest number of investigations. The purpose of these documents is to provide a repository of some of the most important areas of learning identified in its investigations to date, cross-referenced to relevant reports and notes that many of the issues raised have already been the subject of actions by duty holders when responding to RAIB recommendations, or are in the process of being addressed.

2.16 RAIB issued two more summary of learning documents with its [2020 Annual Report](#):

- The safe management of weather-related events which affect train operation, and
- The integrity of train braking systems



## Section 3 – Our enforcement activities

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- 3.1 We secure improvements in health and safety for passengers, the workforce and public through evidence-based advice and encouragement to duty holders to improve and adapt their risk management.
- 3.2 On some occasions, we have to use our formal powers to ensure compliance with the law or to deal with immediate risk. Mostly, we use enforcement notices to stop an activity involving serious risk, or to rectify serious gaps in duty holders' risk control. Our enforcement policy statement sets out how we ensure rigour and consistency in our enforcement decisions by using our enforcement management model.

### Improvement notices in 2020/21

- 3.3 We served 11 improvement notices in 2020/21 compared with 20 in 2019-20. The reasons for these notices included:
- Failure to ensure employees are in a position to plan, prepare and operate locomotive-hauled trains comprising of un-braked vehicles.
  - Failure to ensure unauthorised access to the railway infrastructure is prevented.
  - Failure to conduct a suitable and sufficient risk assessment of the safety of employees boarding and alighting trains to ground level.
  - Lack of provision of boarding aids for passengers using wheelchairs.
  - Not establishing a Safety Management System for the examination, maintenance and repair of structures.
  - Failure to conduct a suitable and sufficient risk assessment of the risk to passengers from falling in to the gap between the train and the platform.
  - Inadequate supervision and instruction to ensure the safety of employees.
  - Failure to make suitable and sufficient Train Dispatch Risk Assessments.
  - Inadequate arrangements for the management of competence of train drivers.

### Prohibition notices in 2020/21

- 3.4 We served two prohibition notices in 2020/21 compared with four in 2019-20:
- Measures not in place to protect dangerous parts of machinery.
  - Damaged and worn on track machine guarding.

## Prosecutions in 2020/21

### Summary overview of our concluded 2020/21 prosecutions:

Defendant(s)	Incident	Fine
Renown Consultants Ltd.	On 19 June 2013, two welders were killed in a road accident as they travelled back to Doncaster after a night shift in Stevenage. No risk assessment had been carried out before the welders were allocated the job and there were failures in the management of fatigue risk amongst the general workforce which exposed them and non-employees to material risk of injury.	£450,000 (plus £300,00 costs)
Network Rail Infrastructure Ltd.	On 31 December 2015, a section of one of the piers supporting Lamington Viaduct, South Lanarkshire collapsed following a period of heavy rainfall. Several trains were allowed to pass over the structure at maximum line speed (>100mph) before the line was closed.	£10,000
Network Rail Infrastructure Ltd.	On 19 August 2016, a 13 year old boy received electrical burns from 25kV overhead line equipment after trespassing on the railway and climbing on to a freight wagon. Boundary measures were found to be incomplete, of a substandard specification, poorly maintained and compromised by adjacent structures. There was evidence that trespass had taken place at the location previously.	£135,000
DB Cargo UK Ltd.	On 14 September 2018, an employee suffered life changing injuries when a freight train collided with his vehicle on a level crossing at Dollands Moor Freight Yard where he was employed as an Operations Supervisor.	£200,000 plus £33,768.61 in costs)

## Annex – Glossary

Abbreviation	Definition
<b>ASLEF</b>	Associated Society of Locomotive Engineers and Firemen: Britain's trade union for train drivers.
<b>CP7</b>	Control Period 7 (2024-2029): the usually five year period in which we review and set track access charges and Network Rail's funding and output levels.
<b>DFT</b>	Department for Transport
<b>ESDP</b>	Electrical Safety Delivery Plan: a Network Rail programme whose objective is to improve the safety of those working on the electrical rail infrastructure by removing the root causes of electrical safety incidents.
<b>FOC</b>	Freight Operating Company.
<b>FWI</b>	Fatality and Weighted Injury index: the common way of measuring harm to people on Britain's mainline railways.
<b>GBR</b>	Great British Railways: a planned new public body that will own and run the mainline railway infrastructure, set ticket prices, collect ticket revenue and contract private passenger service operators to run services.
<b>GSM-R</b>	Global Systems for Mobile Communications – Railway: a radio communications system that provides voice and data services predominantly for the use by drivers and signallers.
<b>HAVS</b>	Hand Arm Vibration Syndrome: a debilitating disease which is caused by prolonged exposure to vibration.
<b>HSE</b>	Health and Safety Executive: Britain's national regulator for workplace health and safety.
<b>LRSSB</b>	Light Rail Safety and Standards Board: An industry body that provides support and guidance to the light rail sector.
<b>LSR</b>	Life Saving Rules: a set of essential rules published by Network Rail that aim to prevent the top ten most common causes of injury and loss of life on the railway.
<b>LUL</b>	London Underground Limited.
<b>Mainline Railway</b>	<p>A railway is a 'mainline railway' unless:</p> <p>a) we determine that it falls within one or more of these categories:</p> <ul style="list-style-type: none"> <li>● metros and other light rail systems;</li> <li>● networks that are functionally separate from the rest of the mainline railway system and intended only for the operation of local, urban or suburban passenger services, as well as transport undertakings operating solely on these networks;</li> <li>● heritage, museum or tourist railways that operate on their own networks; or</li> </ul> <p>b) we determine that heritage vehicles that operate on the mainline railway and comply with national safety rules are deemed not to operate on the mainline railway; or</p> <p>c) it is privately owned infrastructure that exists solely for use by the infrastructure owner for its own freight operations.</p>

Abbreviation	Definition
<b>NFSG</b>	National Freight Safety Group: A working group consisting of freight operating companies and Network Rail whose objective is to improve risk management.
<b>OLE</b>	Overhead Line Equipment: the electrical infrastructure that delivers power to rail vehicles via cables suspended overhead the track.
<b>PIM</b>	Precursor Indicator Model: models accident precursor trends on Britain's mainline railway.
<b>PR23</b>	Periodic Review 2023: The 2023 periodic review of Network Rail (relating to CP7).
<b>PTI</b>	Platform-train interface: the gaps, both in terms of width and height, between a station platform and a train. It also includes risks from electrocution and falls from platforms without trains being present.
<b>RAATS</b>	Red Aspect Approaches To Signals: a tool that estimates the frequency that a signal is approached at red and can be used to normalise SPAD data.
<b>RDG</b>	Rail Delivery Group: an industry body consisting of passenger and freight operators and infrastructure managers that coordinates and leads on cross-railway initiatives.
<b>RIDDOR</b>	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations.
<b>RM3</b>	Risk Management Maturity Model: the tool we use to assess an organisation's ability to achieve excellence in controlling health and safety risks.
<b>ROC</b>	Rail Operating Centre: a building that integrates multiple signalling facilities in to one location.
<b>RPE</b>	Respiratory Protective Equipment: respirators and breathing apparatus used to isolate the wearer from airborne contaminants.
<b>RSSB</b>	Rail Safety and Standards Board: a body by and for the mainline industry, involved in understanding and modelling risk (see SRM and PIM), guiding standards, managing research and development and industry collaboration.
<b>SMIS</b>	Safety management information system: the system managed by RSSB that Britain's mainline railways uses to report safety information.
<b>SPAD</b>	Signal Passed at Danger: where a train passes a red signal without permission and runs the risk of compromising safety.
<b>SRM</b>	Safety Risk Model: models the long-term risk trends on Britain's mainline railways and is recalibrated periodically to take account of the harm caused by incidents.
<b>TA</b>	Technical Authority: A division of Network Rail whose responsibility is to provide technical leadership and support to the rest of the organisation.
<b>TFL</b>	Transport for London.
<b>TOC</b>	Train Operating Company.
<b>TPWS</b>	Train Protection and Warning System: a train protection system that reduces the risk of a train accident by automatically applying the brakes if the train passes a signal at danger or is travelling too fast.





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