



Rail Accident Investigation Branch



Annual Report 2015



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This report is published in accordance with:

- the Railway Safety Directive 2004/49/EC;
- the Railways and Transport Safety Act 2003; and
- the Railways (Accident Investigation and Reporting) Regulations 2005.

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Any enquiries about this publication should be sent to:

| | |
|-------------|---|
| RAIB | Email: enquiries@raib.gov.uk |
| The Wharf | Telephone: 01332 253300 |
| Stores Road | Fax: 01332 253301 |
| Derby UK | Website: www.gov.uk/raib |
| DE21 4BA | |

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Preface

This is the Rail Accident Investigation Branch's (RAIB) Annual Report for the calendar year 2015. It is produced in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005 (SI1992) and also meets the requirement of the European Railway Safety Directive (2004/49/EC).

This legislation can be referred to on RAIB's website at www.gov.uk/raib.

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Top image: Site photograph taken at Langworth.

Second from top: image taken from RAIB report 15/2015: Collision between a train and a collapsed signal post at Newbury (image used with kind permission of Siemens Rail Automation Holdings Ltd).

Third from top: image taken from RAIB report 19/2015: Container detachments at Scout Green, Cumbria, 7 March 2015 and near Deeping St Nicholas, Lincolnshire, 31 March 2015 (image used with kind permission of Network Rail).

Fourth from top: image taken from RAIB report 09/2015: Parting of the live overhead wire at Walkergate station, Tyne and Wear Metro (image used with kind permission of DB Regio Tyne & Wear Ltd).

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RAIB Annual Report 2015



RAIB Annual Report 2015

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Any term explained in Appendix D is shown in *italics* the first time it appears in the report.

Chief Inspector's Foreword



Our Purpose:

To independently investigate accidents to improve railway safety, and inform the industry and the public.

I am pleased to introduce our Annual Report for 2015.

During this year we celebrated our tenth anniversary. In our first ten years, under Carolyn Griffiths' leadership, we were successful in establishing our organisation as one of the leading railway investigation bodies in Europe. Actions reported as taken in response to our recommendations indicate that they have driven important improvements in safety across the railway industry.

Carolyn left at the end of June and I feel privileged to have taken over the role of Chief Inspector in December 2015. There is always more to be done and I look forward to building on our achievements and developing the Branch and the service we provide to the railway industry and the travelling public, into the future.

I am pleased to announce that the structure of our Annual Report is changing. Details of responses to our recommendations and their current status are now available on our [website](#) which will be updated throughout the year. This will enable easy access to current status information without the need to wait for the next Annual Report. A summary of the recommendation status as at 31 December 2015 can also be found in Appendix B.

During 2015 we:

- deployed to 32 accidents and incidents;
- started 21 full investigations and one joint investigation with the Bureau d'Enquêtes sur les Accidents de Transport Terrestre;
- issued three bulletins and five urgent safety advice notices; and
- published 20 reports and made 74 recommendations.

97% of our recommendations made between 2011 and 2015 are implemented or in the process of being implemented.

In general, the UK railway industry's safety record remains among the best in Europe¹. The overall risk to passengers from train accidents is falling² and the last train accident involving a passenger fatality in the UK was at Grayrigg in 2007. I am also pleased that the industry is carrying out a range of initiatives designed to improve safety in many areas, many linked to our findings. These are looked at in more detail in chapter 4.

¹ As indicated by the European Railway Agency: Railway Safety performance in the European Union 2014.

² FWI per year fell from 10 in 2005/6 to 6.7 in 2014/15 as stated in RSSB Learning from Operational Experience Annual Report 2014-15.

Chief Inspector's Foreword

However, although the industry is making good progress in some areas, each year we review the types of accidents we have seen before, areas of learning and issues of particular concern. These include recurrent underlying factors and areas of risk still to be fully addressed. Important areas of learning this year (as further explained in chapter 4) include:

- safety of track workers;
- track quality (including staff resourcing and competence);
- freight train condition;
- platform train interface;
- level crossings; and
- earthworks and structures.

Other emerging themes also include weaknesses in safety validation of the design of on-track plant and ineffective implementation of the new regime governing the activities of Entities in Charge of Maintenance (for freight rolling stock).

A concerning feature of this year's Annual Report is the number of events where luck has prevented an accident involving multiple fatalities. For example:

- At Hest Bank (08/2015) nine track workers saw an approaching train with just enough time to clear the track before it passed them while it was travelling at 98 mph (158 km/h).
- At Newbury (15/2015) a passenger train struck the top of a signal that had collapsed across the railway line. The train did not derail and there were no injuries. However, if a train had been travelling in the opposite direction the consequences could have been more severe because the signal fully obstructed that line and was capable of derailing a train.
- At Froxfield (02/2016) a heavily loaded passenger train hit brick debris while travelling about 90 mph (145 km/h). The impact lifted the front of the train but fortunately the train did not derail.
- At Wootton Bassett Junction (08/2016) a train hauled by a steam locomotive passed a signal at danger on the approach to the junction. The train subsequently came to a stand across the junction shortly after the passage of a high speed train.



Froxfield - Image supplied by Mr John Brown

These events highlight the reasons why thorough and impartial accident investigation is so important in improving railway safety. A comprehensive list of narrowly avoided multiple fatality accidents investigated by RAIB can be found in Appendix A.

Chief Inspector's Foreword

As accident investigators we look at in-depth analysis of the causal chain of accidents and incidents and give new insights into the way machines, infrastructure, the actions of people and organisational factors have contributed to harm. In addition thorough investigation can reveal how combinations of factors come together to create a dangerous event.

Our investigations often identify gaps in control measures, highlight the vulnerability of existing risk mitigation measures and assist the design of new measures. They also shine a searchlight into particular corners of the railway industry and provide valuable intelligence on areas of hidden risk.

I believe that published reports of independent investigations demonstrate to those affected, the wider industry and the public that action is being taken to understand why things sometimes go wrong and that lessons will be learnt. This is important and this is our role as accident investigators.

Looking ahead, I will continue to develop new and effective ways of communicating key information. I will also be exploring different ways to engage even more effectively with industry and be sensitive to its concerns, while at the same time preserving our high degree of independence.



Simon French
Chief Inspector of Rail Accidents
12 May 2016

Further information about us and the role of RAIB can be found on our website www.gov.uk/raib.

What we do

The Rail Accident Investigation Branch (RAIB) independently investigates accidents, to improve railway safety, and inform the industry and the public. To deliver this, we aim to conduct thorough, impartial investigations that are well communicated and result in substantive actions to improve railway safety, while acting in accordance with the highest professional standards and delivering good value for money.

Who we are

We became operational in October 2005 to investigate accidents and incidents on the UK's mainline railways, metros, tramways³ and many heritage railways.

We are not a prosecuting body and do not apportion blame or liability. We are independent and our Chief Inspector reports the outcomes of investigations to the Secretary of State for Transport.

Our organisation consists of full time rail and investigation specialists. With our administration staff our team totals 43 people. They are based in two operational centres, at Derby and Farnborough. Having two centres means we can respond more quickly to accidents in any part of the UK.

Our responsibilities

Our responsibilities include:

- investigating the causes of railway accidents and incidents where we believe our investigation will bring safety learning to the industry;
- identifying risks which may lead to a similar accident happening again or make an accident worse;
- making recommendations, where appropriate, to improve railway safety; and
- publishing the results of our investigations.

RAIB's response to notifications

The Chief Inspector (or senior inspector), a Duty Co-ordinator (DC) and a team of inspectors are on call 24 hours a day, 365 days per year to respond to incidents.

On being notified of an accident or incident, we obtain sufficient information to decide how to respond. On the basis of the initial notification the DC will decide whether to immediately mobilise personnel to the accident site. Usually this is to conduct a preliminary examination.

Preliminary Examination

The purpose of the preliminary examination is to gather sufficient details and evidence to enable us to make an informed decision whether or not to conduct a full investigation.

³ Tramways in Scotland came into RAIB's scope on 26 May 2015, following an amendment to the Railways and Transport Safety Act 2003 Act.

1 The Rail Accident Investigation Branch - About Us

Investigation

Our investigations are conducted independently of all other organisations and investigations by other parties. However, we can share factual evidence with industry stakeholders and will share such evidence with other statutory investigatory bodies. We will not share the identities of witnesses or records of interviews, nor medical records relating to persons involved in the accident or incident.

We will keep involved parties informed of emerging findings throughout the investigation and may inform the broader industry of progress and findings during the investigation by way of urgent safety advice or an interim report.

If we decide that a full investigation is disproportionate to the potential safety lessons that may be learned then we may publish a bulletin, or from 2016 a new web entry called a Safety Digest. Safety Digests are intended to provide important safety information to the rail industry when RAIB has concluded that an event does not justify further investigation.



The investigation report

On completion, the Chief Inspector sends the report to the Secretary of State for Transport and we also publish it on our website.

The recommendation process

Where appropriate, our investigation reports will include recommendations to improve safety and to prevent the reoccurrence of similar accidents.

Our legal basis

The roles and duties of RAIB are set out in the Railways and Transport Safety Act 2003 ([the Act](#)) and its associated implementing regulations, the Railways (Accident Investigation and Reporting) Regulations 2005 ([the Regulations](#)). Together, the Act and the Regulations also implement the requirements of the European Railway Directive (2004/49/EC) ([the Directive](#)), which came into force in 2004. The Directive creates a common regulatory framework for safety across Europe and requires each member state to establish national safety authorities (eg Office of Rail and Road (ORR)), and an independent body to investigate rail accidents (RAIB).

The Regulations place a duty on railway industry bodies whose staff or property is involved in an accident or incident to notify RAIB. RAIB is mandated to investigate any serious railway accident, as defined in the Regulations, and also has the freedom to investigate other types of accident or incident where it believes that an investigation could significantly improve railway safety.

[Our Priorities](#)

In 2015 - 2016 our priorities are:

- continue to improve good engagement with industry, regulators and other stakeholders;
- explore ways to further reduce the average time taken to publish our reports, without compromising on quality; and
- find additional effective ways to disseminate key information to stakeholders, press and media.

[Board of Transport Accident Investigators](#)

The Board of Transport Accident Investigators was established in 2003 by the Secretary of State, consisting of the three Chief Inspectors of accident investigation (Rail, Marine and Air). The Board meets quarterly to identify and develop common strategic issues to improve independent accident investigation in the UK.

This allows the Chief Inspectors to maintain operational independence and reporting of safety matters to the Secretary of State while benefiting from the branches working together.

2 Operational Activity 2015

What does RAIB investigate?

The 2003 Act requires that RAIB investigate all serious accidents⁴ where potential safety lessons can be learned that will improve railway safety and will prevent railway accidents and incidents. RAIB also has the legal power to enable it to investigate non-serious accidents or incidents for the same purpose.

When deciding whether or not to investigate, RAIB takes account of the potential for safety lessons to be learnt and this will include not only serious accidents but also incidents which under slightly different circumstances might have led to a serious accident (ie the near miss events).

The main difference between an accident and such an incident, which is the severity of the consequences, is often related to chance.

The detailed investigation of such incidents, in the same manner as the investigation of serious accidents, provides many of the learning points to improve safety at minimal cost in terms of adverse consequences to passengers, staff, the industry, and the railway infrastructure. It also means that opportunities for improving safety and preventing future accidents or mitigating the economic and human consequences are not passed over due to a failure to learn from previous incidents.



Operational Activity 2015

During the period from 1 January to 31 December 2015, RAIB received 296 notifications of railway accidents and incidents from the industry. These resulted in 32 (immediate and delayed) deployments of inspectors to the accident or incident site to carry out a preliminary examination. There were three additional preliminary examinations which did not require deployment to site.

As a result of the analysis of the information gathered, we started 21 full investigations and one joint investigation with the Bureau d'Enquêtes sur les Accidents de Transport Terrestre (BEA-TT). We issued three bulletin reports and five urgent safety advice notices. (See pages 20 and 21 for more information on bulletins and urgent safety advice.)

Investigation reports published in 2015

RAIB completed and published 20 full investigation reports (including one class investigation) in 2015. While our aim is to publish reports and bulletins within 12 months, the length of individual investigations can sometimes extend beyond this because of the complexity and scale of the investigation, late notification by the industry or the need to address complex issues raised during formal consultation. In 2015 the average time taken to publish reports was 11.3 months⁵ from the date of occurrence (as compared to 12 months in 2014). The shortest time taken was 8.3 months and the longest 19.2 months.

⁴ 'Serious accident' means an accident involving a derailment or collision of rolling stock which has an obvious impact on railway safety regulation or management of safety and includes such an accident that results in – (a) the death of at least one person; (b) serious injuries to five or more persons; or (c) extensive damage to rolling stock, the infrastructure or the environment.

⁵ Excluding class investigations.

Table 1 provides a summary of the outputs achieved in 2015.

Table 1 – RAIB outputs in 2015

| | |
|--------------------------------------|----|
| Preliminary examinations completed | 35 |
| Full investigation reports published | 20 |
| Bulletins published | 3 |
| Urgent safety advice issued | 5 |
| Investigations commenced | 21 |

Joint investigations

Fire on board a freight shuttle in the Channel Tunnel 17 January 2015: RAIB worked with BEA-TT, the body responsible for the investigation of railway accidents in France, to jointly investigate this incident. Since the train stopped in the French section of the tunnel, the investigation was led by BEA-TT. RAIB's scope was primarily to determine the cause of the fire and our findings were published on our website on 9 November 2015. BEA-TT's part of the investigation has been completed and the report was published on 5 May 2016, with important findings concerning Eurotunnel's processes for safety validation of changes to design of its assets.

Northern Ireland

Although no investigations have been started or published in 2015 concerning railways in Northern Ireland, RAIB continues to work closely with Northern Ireland Railways and the safety authority, the Department for Regional Development (DRDNI). We are pleased to note that substantive actions have been taken in response to recommendations made into the investigation concerning a train which ran onto a washed-out embankment near Knockmore ([14/2013](#)).

Classification of accidents and incidents that have to be notified to the European Rail Agency (ERA) 2011 - 2015

RAIB has a duty to investigate and to report to the ERA all serious railway accidents, as defined by the Directive, and where necessary, any other similar accident with an obvious impact on railway safety regulation or the management of safety occurring on the railways in the UK.

2 Operational Activity 2015

The ERA has published guidance to promote consistent categorisation of investigations in accordance with the Directive. RAIB uses this to classify its investigations according to Articles 19(1) and 19(2)⁶.

- Article 19(1) - a serious accident where the investigation is mandatory.
- Article 19(2) - an accident or incident, which under slightly different conditions might have led to a serious accident, ie a near miss of a serious accident – see key below a, b, c, or d:
 - a. The seriousness of the accident or incident
 - b. It forms part of a series of accidents or incidents relevant to the system as a whole
 - c. Its impact on railway safety on a community level
 - d. Requests from *infrastructure managers*, the safety authority or the Member State

The following table (Table 2) shows the breakdown of accidents and incidents that RAIB has investigated between 2011 and 2015. The figures have been collated according to the date of occurrence and not publication of the report.

Table 2 – Investigations by category sorted by Article 19(1) and 19(2)⁷

| Basis for Investigations by the European Railway Safety Directive category | 2011 | 2012 | 2013 | 2014 | 2015 | TOTAL |
|---|-------------|-------------|-------------|-------------|-------------|--------------|
| Article 19(1) | 4 | 4 | 5 | 2 | 1 | 16 |
| Article 19(2) | 23 | 20 | 21 | 17 | 20 | 101 |
| Total | 27 | 24 | 26 | 19 | 21 | 117 |

Table 3 provides details of the investigations completed in 2015 and the legal basis for the investigation. The references 19(1) and 19(2) refer to the relevant articles in the Directive.

Table 4 provides details of full investigations commenced in 2015 and the legal basis for the investigation.

Table 5 provides details of one investigation opened in 2014 but not completed by 31 December 2015.

Chart 1 gives a breakdown of the total number of investigations by type of accident for the five year period 2011 – 15.

⁶ In 2008 the ERA widened the scope of the Directive to include tramways and heritage. Since then, RAIB has categorised all accidents and incidents according to Article 19(1) or 19(2) and does not include the category 21(6).

⁷ Figures do not include three class investigations (which address more general safety issues).

Table 3 – Investigations completed in 2015

| Report Number | Event date | Publication date | Title of investigation (location) | Occurrence type | Basis for investigation | |
|---------------|-------------------------|------------------|--|--------------------------------|-------------------------|-------|
| | | | | | 19(1) | 19(2) |
| 01/2015 | 22/01/2014 | 16/02/2015 | Fatal accident involving a track worker near Newark North Gate station. | Staff hit by train (fatality) | X | |
| 02/2015 | 27/08/2013 | 02/04/2015 | Derailment of a freight train at Stoke Lane level crossing, near Nottingham. | Freight train derailment | | a |
| 03/2015 | 25/05/2014 | 30/04/2015 | Derailment of an empty passenger train at Paddington station. | Passenger train derailment | | a |
| 04/2015 | 12/05/2014 | 21/05/2015 | Runaway and subsequent collision near to Loughborough Central station, Great Central Railway. | Collision with other train | | a |
| 05/2015 | 11/05/2014 | 28/05/2015 | Fatal accident at Frampton level crossing. | Level crossing fatality | X | |
| 06/2015 | 24/06/2014 | 15/06/2015 | Accident to a track worker near Redhill. | Staff hit by train (Injury) | | a |
| 07/2015 | 23/09/2014 | 24/06/2015 | Train driver receiving a severe electric shock at Sutton Weaver, Cheshire. | Electric shock | | a |
| 08/2015 | 22/09/2014 | 16/07/2015 | Near miss involving track workers near Hest Bank, Lancashire. | Staff hit by train (near miss) | | a |
| 09/2015 | 11/08/2014 | 30/07/2015 | Parting of the live overhead wire at Walkergate station, Tyne and Wear Metro. | Fire on rolling stock | | a |
| 10/2015 | 02/10/2014 | 06/08/2015 | Derailment at Porthkerry, South Wales. | Freight train derailment | | a |
| 11/2015 | 02/04/2014 | 12/08/2015 | Freight train derailment at Angerstein Junction. | Freight train derailment | | a |
| 12/2015 | 26/10/2014 | 13/08/2015 | Train struck and damaged by equipment cabinet door in Watford Tunnel. | Collision with an obstacle | | a |
| 13/2015 | 01/11/2014 | 17/08/2015 | Runaway of 'iron men' trolleys and subsequent near miss at Raven level crossing, Garnant, Carmarthenshire. | Runaway incident | | a |
| 14/2015 | | 20/08/2015 | Engineering protection irregularities. | Class investigation | | |
| 15/2015 | 17/11/2014 | 23/09/2015 | Collision between a train and a collapsed signal post at Newbury. | Collision with an obstacle | | a |
| 16/2015 | 23/10/2014 | 24/09/2015 | Freight train derailment at Heworth, Tyne and Wear. | Freight train derailment | | a |
| 17/2015 | 28/01/2015 | 07/10/2015 | Trains struck platform at Moston, Manchester. | Collision with an obstacle | | a |
| 18/2015 | 30/01/2015 | 21/10/2015 | Electrical arcing and fire under a train near Windsor & Eton Riverside. | Fire on rolling stock | | a |
| 19/2015 | 07/03/2015 & 31/03/2015 | 07/12/2015 | Container detachments at Scout Green, Cumbria, and near Deeping St Nicholas, Lincolnshire. | Unsafe load | | a |
| 20/2015 | 28/12/2014 | 16/12/2015 | Unsafe events at Heathrow Tunnel Junction. | Staff hit by train (near miss) | | a |

2 Operational Activity 2015

Table 4 – Full investigations commenced in 2015

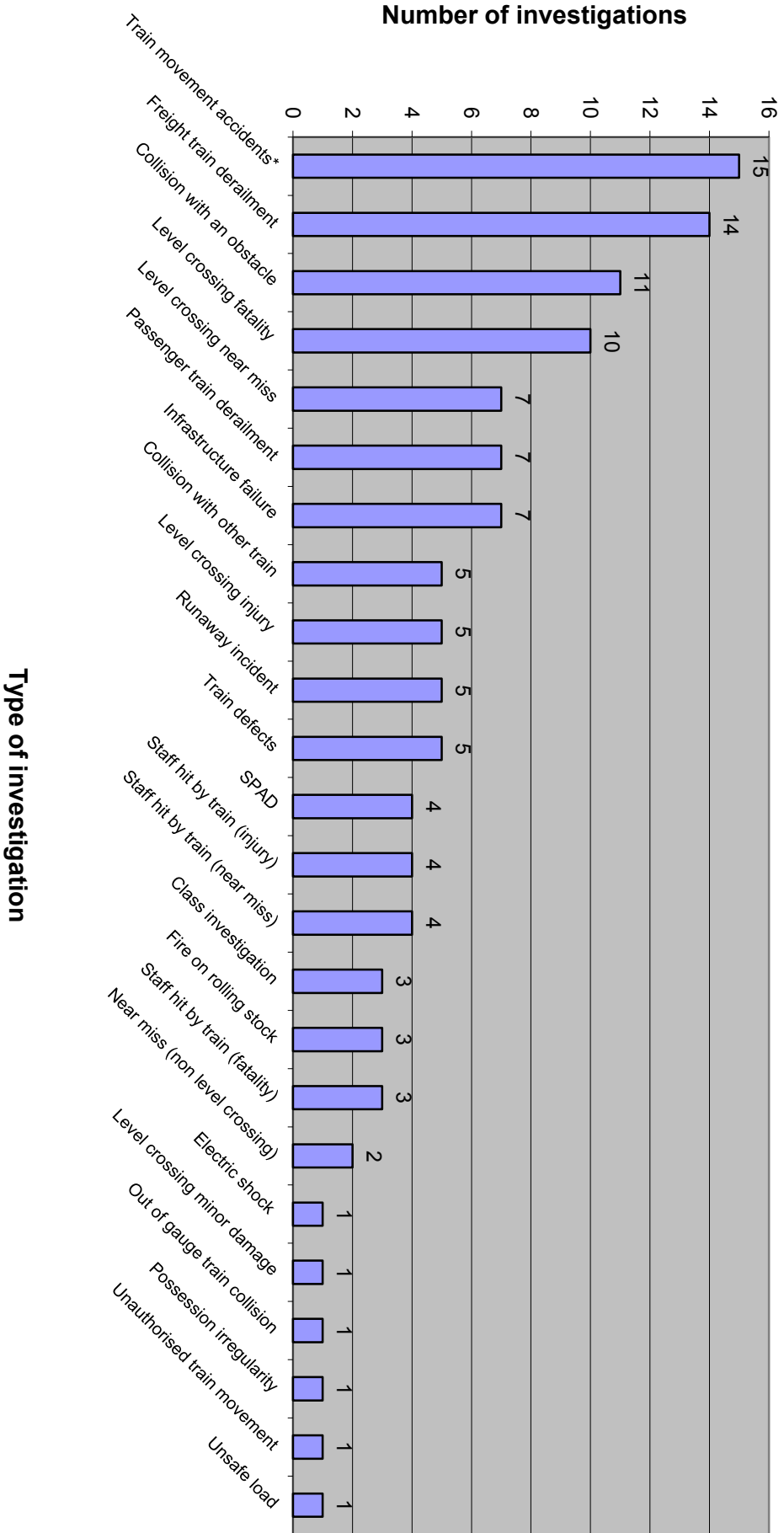
| Event date | Title of the investigation (location) | Occurrence type | Basis for investigation | |
|-------------------------|--|--|-------------------------|-------|
| | | | 19(1) | 19(2) |
| 28/01/2015 | Trains struck platform at Moston, Manchester. | Collision with an obstacle | | a |
| 30/01/2015 | Electrical arcing and fire under a train near Windsor & Eton Riverside. | Fire on rolling stock | | a |
| 22/02/2015 | Collision between a train and a fallen bridge parapet on the line at Froxfield, Wiltshire. | Collision with an obstacle | | a |
| 07/03/2015 | Signal passed at danger (SPAD) on the approach to Wootton Bassett Junction, Wiltshire. | SPAD | | a |
| 07/03/2015 & 31/03/2015 | Container detachments at Scout Green, Cumbria, and near Deeping St Nicholas, Lincolnshire. | Unsafe load | | a |
| 12/03/2015 | Passenger fell between a train and the platform, after being dragged for a short distance by a train departing from Clapham South station. | Train movement accident involving a passenger | | a |
| 23/03/2015 | Freight train derailment at Washwood Heath West Junction. | Freight train derailment | | a |
| 10/04/2015 | Passenger trapped in train doors at West Wickham station. | Train movement accident involving a passenger | | a |
| 12/05/2015 | Tram collision with pedestrian near Market Street tram stop, Manchester. | Train movement accident involving a pedestrian | | a |
| 14/05/2015 | Collision between a train and a tractor at Oakwood Farm <i>user worked crossing</i> . | Level crossing injury | | a |
| 03/06/2015 | Freight train derailment at Angerstein Junction. | Freight train derailment | | a |
| 30/06/2015 | Freight train derailment near Langworth. | Freight train derailment | | a |
| 25/07/2015 | Passenger trapped in train door at Hayes & Harlington station. | Train movement accident involving a passenger | | a |
| 26/07/2015 | Passenger train struck a number of cows and subsequently derailed at Godmersham. | Collision with an obstacle | | a |
| 01/08/2015 | Collision and subsequent derailment in a work site, at Logan. | Collision with other train | X | |
| 11/09/2015 | Overspeed incident at Fletton Junction. | Unauthorised train movement | | a |
| 17/09/2015 | Collision between a train and buffer stops at King's Cross station, London. | Collision with an obstacle | | a |
| 22/10/2015 | Collision between trams at Shalesmoor tram stop. | Collision with other train | | a |
| 28/03/2015 & 03/11/2015 | SPADs at Reading Westbury Line Junction & Ruscombe Junction. | SPAD | | a |
| 07/11/2015 | Passenger train derailment near Knaresborough. | Passenger train derailment | | a |
| 31/12/2015 | Scour damage leading to route closure at Lamington viaduct. | Infrastructure failure | | a |

Table 5 – List of investigations opened in 2014 but not completed by 31 December 2015

| Event date | Title of investigation (location) | Occurrence type | Basis for investigation | |
|------------|---|------------------|-------------------------|-------|
| | | | 19(1) | 19(2) |
| 27/11/2014 | Runaway of an on-track machine at Bryn, near Wigan. | Runaway incident | | a |

Summary details of open investigations can be found at www.gov.uk/raib under the link called 'Current investigations'.

Chart 1 - Types of incidents/accidents investigated 2011 - 2015



Note: "Train movement accidents" include passengers and members of public (not staff).

2 Operational Activity 2015

Bulletins

Normally, when inspectors are deployed to the site of an accident or incident, it is to conduct a preliminary examination of the circumstances and key evidence. In some instances, on the basis of a review of this information, we may conclude that further investigation by RAIB would be unlikely to result in formal recommendations for the improvement of safety. However, sometimes, more general safety lessons are identified where we believe that it would be beneficial to make these widely known across the industry, and bulletins are used for this. (In 2016 a new web entry called a Safety Digest is to replace the bulletin.)

During 2015, we published three bulletins on our website.

The bulletins covered:

- A tram derailment near Mitcham Junction tram stop ([bulletin 01/2015](#)).
- Freight train derailment at Ashburys, Manchester ([bulletin 02/2015](#)).
- Collision between a train and a wooden sleeper near Somerleyton, Suffolk ([bulletin 03/2015](#)).

Urgent safety advice (USA)

In addition, RAIB can issue urgent safety advice at any stage during an investigation when it believes that there is a need to provide immediate information to the relevant industry bodies about the wider safety issues that have been identified. If the issue affects other European member states the safety advice is reported to the ERA via their safety information system (SIS); this action alerts all member states to the advice. During 2015 RAIB issued urgent safety advice on five occasions, as follows:

Table 6 – Urgent safety advice issued by the RAIB in 2015

| Incident date | Incident | Urgent safety advice | Date of USA | Date sent to ERA SIS |
|---------------|---|--|-------------|-----------------------------------|
| 07/03/2015 | Container blown off freight train near Scout Green. | USA issued so that urgent consideration be given to the efficacy of current measures that are intended to manage the risk of containers being blown off wagons fitted with <i>spigots</i> that are non-compliant with UIC ⁸ 571-4, particularly inward hinging designs, and the steps that are required to fully implement recommendation 3 of RAIB's investigation into similar incidents at Hardendale and Cheddington. | 25/03/2015 | 27/03/2015 |
| 10/04/2015 | Passenger trapped in train doors and dragged under train at West Wickham station. | USA issued to alert operators and owners of rolling stock that some types of trains have door control systems that do not disable the opening of doors by passengers after the driver has initiated the closure sequence, so creating a risk of trapping. | 23/04/2015 | UK specific – not sent to ERA SIS |
| 01/08/2015 | Collision between engineering trains in a work site near Logan. | USA issued regarding the control of risks associated with the movement of engineering trains within worksites. | 11/08/2015 | UK specific – not sent to ERA SIS |
| 23/03/2015 | Freight train derailment at Washwood Heath West Junction. | USA issued regarding the control of risks associated with worn centre pivot liners on freight vehicle <i>bogies</i> . | 09/09/2015 | 09/09/2015 |
| 25/07/2015 | Passenger trapped hand in train door and dragged at Hayes & Harlington station. | USA issued to train operators and to trades unions representing train drivers to alert them to the dangers associated with drivers assuming that it is safe to dispatch a train from a station on the basis of having obtained door interlock alone. | 30/11/2015 | UK specific – not sent to ERA SIS |

⁸ Union International Chemins de Fer.

3 Recommendations

Our investigation reports make recommendations to improve safety and to prevent the reoccurrence of similar accidents.

We direct recommendations to any organisation or person we think is best placed to implement the changes required (the 'end implementer'). This includes railway, non-railway, private and public sector organisations.

However, each recommendation is sent to the appropriate safety authority⁹ or public body.

The purpose of dealing with recommendations in this way is so that the safety authority can ensure that the 'end implementers' properly consider the recommendations, and where appropriate act on them, as the Directive and Regulations require. The Regulations give the safety authority (primarily the ORR) the power to require end implementers to provide full details of the measures they intend to take, or have taken, to implement the recommendation.

The ORR must satisfy itself that the end implementer has either implemented the recommendation or, otherwise, has taken sufficient actions to mitigate the related risks to an appropriate level. The safety authority is also required to inform RAIB, within a period not exceeding 12 months¹⁰, of the measures taken, or the reasons why no implementation measures are being taken.

Although, RAIB has no role or statutory powers to follow up on the implementation of recommendations, unless it is necessary to do so as part of a subsequent investigation, ORR, other safety authorities, or other public bodies are required to report to RAIB the actions taken.

Our website includes details of the response to recommendations for every report published. These response reports for each published investigation can be found alongside the associated report in the [Rail Accident Investigation Branch reports page](#) on the website.

These response reports are compiled from information provided to us by the ORR, other safety authorities, or other public bodies, and the categories used are based on the following ORR descriptors (these descriptors were used during 2015 and have subsequently been amended in 2016):

- **Implemented** – meaning that all actions to deliver the recommendation have been completed.
- **Implemented by alternative means** – meaning that the intent of the recommendation has been satisfied in a way that was not identified by RAIB during the investigation.
- **Implementation ongoing** – meaning that work to deliver the intent of the recommendation has been agreed and is in the process of being delivered to a time bound plan.
- **In-progress** – meaning that the relevant safety authority has yet to be satisfied that an appropriate plan, with timescales, is in place to implement the recommendation; and work is in progress to provide this.
- **Non-implementation** – meaning that the recommendation has been considered and no implementation action is to be taken.

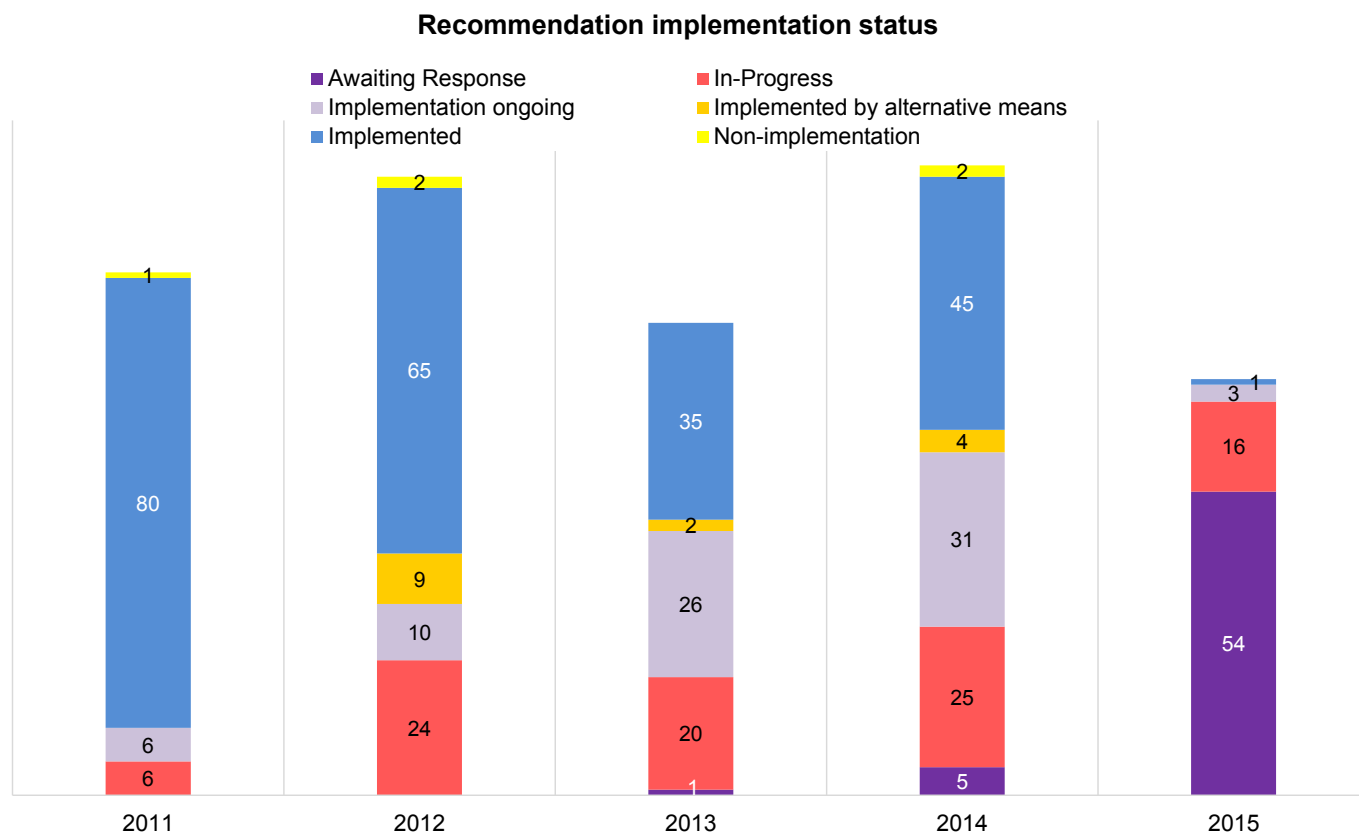
If RAIB is still awaiting an initial report from the relevant safety authority or public body on the status of the recommendation it is categorised (by RAIB) as 'Awaiting Response'.

⁹ The safety authority is the safety regulator; for Great Britain this is primarily the ORR although there are some recommendations made by RAIB where the Health and Safety Executive (HSE) has been the safety authority (for accidents occurring that were not attributed to the railway and are investigated under the Health and Safety at Work etc Act 1974); for the Channel Tunnel it is the Inter Governmental Commission and for Northern Ireland it is the Department for Regional Development.

¹⁰ In accordance with Regulation 12(2)(b) of the Railways (Accident Investigation and Reporting) Regulations 2005.

The following chart provides the status of recommendations made between 1 January 2011 and 31 December 2015.

Chart 2 – Recommendation implementation status per year (includes recommendations made not only to safety authorities but also public bodies).



For further information we have also placed on our website:

- an [Index of recommendations and their current status](#).

The comprehensive listing will be periodically updated to capture the latest status of each recommendation (as reported to us by the relevant safety authority or public body), and a link to the recommendation response report (as described above) which provides the full text of the recommendation.

Also we have attached to this report:




- Summary of recommendation status 2015 (Appendix B).

This includes the status of recommendations that were made or changed during 2015, or which remain open as at 31 December 2015.

Where RAIB has concerns, based on the risk, over the way that an organisation has responded to the recommendation, RAIB raises these concerns with the relevant safety authority and the responses are marked with a coloured triangle. We may also add a comment and this will appear in the recommendation response report.











3 Recommendations

The triangles used are as follows:

-  RAIB has particular concerns that no actions have been taken in response to a recommendation.
-  RAIB has concerns that the actions taken are inappropriate or insufficient to address the risk identified during the investigation.
-  RAIB notes that substantive actions have been reported but RAIB still has concerns.

The following table shows those recommendations, where the status has changed during 2015 but RAIB has concerns about the response.

Table 7 – Summary of recommendations of RAIB concern

| Investigation Name | Rec No | Concern | Triangle Colour |
|---|--------|---|---|
| Fatal accident at James Street station, Liverpool, 22/2012. | 3 | More evidence is needed to consider whether the PTI strategy, and associated research, will lead to delivering the recommendation's intent effectively. | White  |
| Dangerous occurrence at Lindridge Farm user worked crossing, near Bagworth, Leics, 11/2013. | 1 | No substantive change has been made as Network Rail believes its standards already cover this. RAIB has notified ORR that it disagrees. ORR has sought further clarification from the end implementer. | White  |
| | 3 | The response fails to fully address the intent of the recommendation. RAIB is concerned that the same circumstances that applied at Lindridge Farm could still occur. ORR has asked the end implementer to reconsider its position. | Blue  |
| Derailment of a freight train at Barrow-upon-Soar, Leicestershire, 22/2013. | 1 | It is not clear to RAIB how existing processes and proposed changes will address the intent of the recommendation. | Blue  |
| Fatal accident at Athelney level crossing, near Taunton, Somerset, 04/2014. | 2 | RAIB believes that actions taken have not met the intent of giving motorists an obvious way of contacting the signaller if AHBs are down for what may seem to be an abnormally long time. | Blue  |
| Passenger train collision at Norwich, 09/2014. | 3 | RAIB is concerned that the audit process allows for consideration of compliance with some (not all) safety related aspects of the operational procedure. RAIB considers that the audit process should be re-examined. | Blue  |
| Derailment at Primrose Hill/Camden Road West Junction, 21/2014. | 1 | In order to consider this recommendation to have been addressed, further action (which has already been proposed) is required. | White  |
| | 2 | Although some positive steps have been taken, (ie the establishment of the cross-industry working group) the findings of the group have not yet been delivered or fully considered. | Blue  |
| Passenger train collision with trolley at Bridgeway UWC, 25/2014. | 2 | RAIB remain concerned that the applicability to other maintenance delivery units of safety issues (raised in this recommendation) have not been determined or acted upon. | White  |
| | 3 | The response fails to fully implement the intent of the recommendation. RAIB is concerned that the same circumstances that applied at Bridgeway could still occur. | Blue  |

Repeat causality

RAIB has identified four accidents during 2015 that may have been avoided had a previously identified causal factor been addressed more fully, or in a more timely fashion. These are:

- i. **Near miss involving track workers near Hest Bank (08/2015):** This near miss involved a group of track workers that narrowly avoided being run down by a train travelling at 98 mph (158 km/h). This occurred because a lookout did not operate a warning device to warn the group of workers that a train was approaching. It is possible that the lookout forgot to do this because he had delayed his response to the approaching train because of the extended sighting distance at that location.

The investigation into an accident at Cheshunt Junction in 2010 (06/2011) had already identified this issue and RAIB's recommendation said that Network Rail should evaluate the behaviour of staff working on the track at locations with extended sighting times and, based on the understanding gained as a result of this, establish a safe system of work to cover activities at such locations. The recommendation was not implemented. Network Rail has reported this was due to an administrative error, and it has now been re-opened.

RAIB considers that implementation would have had the potential to reduce the risk associated with the lookout delaying his warning.

- ii. **Runaway of 'iron men' trolleys and subsequent near miss at Raven level crossing, Garnant (13/2015):** This incident involved the runaway of two trolleys loaded with a length of rail, and resulted in a group of workers having to jump clear at the last moment.

Recommendation 3 of the report into the runaway of a track maintenance trolley near Haslemere in 2011 (14/2012), said that the company responsible for the maintenance of the trolleys involved in both incidents (Torrent Trackside) should improve its processes for providing suitable information, instruction and training to its personnel. The company reported to the ORR that it had done this. However, the Raven level crossing investigation showed that the company's processes for capturing manufacturers' maintenance requirements were ineffective, and led directly to the inability of the brakes on the trolleys to stop them on an incline.

- iii. **Freight train derailment at Heworth, Tyne & Wear (16/2015):** This derailment involved wagons fitted with a type of suspension system that had been the subject of a previous RAIB recommendation (recommendation 2 of the report into the derailment at Bordesley Junction in 2011 (19/2012)). This said that Network Rail should lead a fundamental review of how this type of suspension is maintained.

By the time of the accident at Heworth, this review had not taken place, although the company which operated and maintained the wagons (Freightliner) had made some modifications to the suspension system. If the maintenance requirements of the suspension had been reviewed as recommended, the effect of a worn damper pad on the operation of the suspension might have been identified.

3

Recommendations

- iv. **Container detachments at Scout Green, Cumbria and Deeping St Nicholas, Lincolnshire (19/2015)**: The detachment of empty shipping containers from wagons in high winds was previously investigated in 2008 (12/2009), in respect of the detachment of seven containers from two trains at Hardendale and Cheddington.

That report recommended (recommendation 1) that freight operating companies should review the action they take when conveying lightweight or empty containers in windy conditions, and (recommendation 3) that freight operating companies operating wagons fitted with non-compliant UIC spigots should develop and implement measures to reliably retain empty or lightweight containers in windy conditions.

Actions to implement recommendation 1 were ineffective in preventing the accidents in 2015, and work to implement recommendation 3 was still ongoing in 2015, six years after it was first made. Effective implementation of either of these recommendations would have prevented the accidents in 2015, both of which had the potential for disastrous consequences had any other trains been in the vicinity when the containers became detached.

Recommendations and reports published in 2015

In the 20 reports published in 2015, RAIB made a total of 74 recommendations; the average number of recommendations per report is approximately four. Recommendations made in 2015 were targeted at the following organisations (in some cases they were made to more than one implementer):

Department for Transport (1).

Light rapid transit (LRT) operating companies and infrastructure managers (5).

Main line freight train operators (3).

Manufacturers (7).

Network Rail (47).

ORR (1).

Other public bodies (1).

Passenger, train operating companies (TOC) (7).

RSSB (4).

Railway contractors (4).

Rolling stock maintainers (3).

Rolling stock leasing companies (ROSCO) (2).

The purpose of this chapter is to capture some important areas of safety learning identified by RAIB during 2015. It is not intended to be comprehensive in scope but is focused on those areas which were either prominent during the year or of particular concern to RAIB. The topics selected this year are:

- safety of track workers;
- track quality (including staff resourcing and competence);
- freight train condition; and
- platform train interface.

Four fact sheets have been prepared to summarise key information of the above topics.

In addition, safety learning concerning the following topics have also been highlighted:

- level crossings; and
- earthworks and structures.

There is also a section on other areas of concern which we wish to bring to the attention of the railway industry and ORR.

The safety of track workers

In 2015 RAIB published five (and one class) investigation reports concerning the safety of track workers. Although only one of these related to a fatality (Newark (01/2015)), the accident to a track worker at Redhill (06/2015) resulted in life changing injuries, and others had the potential for very serious consequences.

Fact sheet 1 summarises the main cause of each accident or incident and the safety learning that was highlighted by the investigation. From these it can be seen that there are two overriding areas of concern. Firstly, the attitudes and behaviours within teams of track workers, which can see staff feeling unable or unwilling to challenge unsafe working practices. Secondly, the incorrect planning, or execution, of work which can result in less safe practices being adopted, which can then go unchallenged by those responsible for site safety.

Areas of particular concern to RAIB

Our 2014 Annual Report stated a number of factors that are required to help ensure the safe working of track teams. These included:

- the ability of the leader to exercise authority and influence;
- the need for the leader to understand the task;
- the need for planning and effective communications between all parties;
- the need for good leadership and effective team working; and
- the need for clear instructions and procedures.

All reports on this type of accident published during 2015 have again found one or more of these to be deficient.

4 Identification of important recurrent issues and areas of concern

At Newark (01/2015) the report identified that the key factor leading to the accident was a breakdown of safety discipline and vigilance at the work site. This resulted in shortcuts to pre-work site checks and briefing; including the absence of the controller of site safety (COSS) from the site during the work activities.

It reinforces the importance of the industry continuing to address the attitudes and behaviours of front-line staff and their managers, particularly those who have become very familiar with the tasks that they are undertaking.

At Redhill (06/2015), where a track worker was struck and injured, our investigation found that the 'position of safety' the team was using was not adequate because there was no level place to stand clear of the line. The team leader was also unaware of the imminent danger from an approaching train. One of the key safety lessons was for employers to emphasise the importance of not working in dangerous locations, and, for individuals to take responsibility to identify and challenge when the working environment is, or becomes, unsafe.

The way work is planned can often be a factor in accidents involving track workers. In the case of Redhill the system of work was not sufficiently reviewed or challenged which resulted in work being undertaken at a site where the necessary protection, while trains were still running, was not available.

At Hest Bank (08/2015) the track workers saw the approaching train with just enough time to clear the track before it passed them while travelling at 98 mph (158 km/h). This investigation highlighted the need to mitigate both the risk associated with extended warning times when the sighting of approaching trains is very good, and the risk of high reliance on a single lookout. A previous RAIB recommendation (Cheshunt Junction (06/2011)) intended to mitigate this risk had not been addressed.

While the safety lessons in relation to the incident at Raven level crossing (13/2015) were specific to the planning of work involving manually propelled plant, they again highlight the need for those involved in the planning process to have the information required to appropriately mitigate the risks involved in the work.

Railway industry initiatives to address the risk to track workers

RAIB is encouraged that Network Rail and its contractors remain determined to address track worker safety issues. In recent years, the industry has focused on addressing the behaviours and attitudes of track workers while also developing the leadership skills of supervisors and managers. 2015 saw a shift of focus towards planning for the implementation of a major track safety initiative 'Planning and Delivery of Safe Work' (PDSW). This is designed to ensure that every task is correctly planned, and subsequently documented in a permit to work, similar to those used in other industries. Execution of the plan that is documented by the permit is then to be implemented by a specially selected and trained individual, designated the 'Safe Work Leader' (SWL). If successfully implemented, the SWL will be responsible for both the work activity, and the safety of the team.

If implemented as intended by Network Rail, the PDSW scheme should help to address a number of issues that have been raised by RAIB over recent years. These include:

- the extent to which the person in charge of site safety is able to exercise effective control of work groups that may include their supervisor or manager;
- the need for a properly documented plan that includes a diagram showing all relevant features, and identifying particular hazards; and
- to reinforce the need for structure and discipline in the way that planned works are implemented.

RAIB is also encouraged by the current work that is being undertaken to examine the role of improved technology in managing the risk to track workers and notes that £250 million has been ring-fenced in CP5¹¹ for this purpose.

Implementation of industry initiatives

While supporting the objectives that the industry has set itself, and recognising the efforts that Network Rail has made to involve all parts of the industry, RAIB is concerned about the slow progress that is being made with the implementation of PDSW. Furthermore, RAIB is urging that, once PDSW has been successfully implemented, thought should be given to extending its scope to include other groups of staff that play an important role in establishing a safe system of work, such as the signaller, the person in charge of possession (PICOP) and the electrical control operator (ECO). Of these the signaller is of particular concern given the need to ensure that the increasing demand for short-term line blockages (as an alternative to working on lines that are open to traffic) does not lead to a potentially catastrophic error by the signaller or SWL (eg miscommunication leading to the wrong line being blocked).

Class investigation

The number of near miss accidents involving one or more track workers, and the ways in which safe systems of work have broken down, have led us to conclude that we need to further investigate the underlying factors. It is for this reason that RAIB has begun in early 2016 a class investigation focused on the safety of track workers when working on lines that are open to traffic. This investigation will involve a careful examination of industry safety data, meetings with key players in the industry (including ORR, trade unions and contractors) and discussions with staff responsible for the planning and execution of works.

¹¹ CP (Control Periods) are the five year timespans that Network Rail uses for financial and other planning purposes. Each Control Period begins on 1 April and ends, five years later, on 31 March, to coincide with the financial year. CP4 ran from 2009 to 2014 and CP5 is due to finish in 2019.

4 Identification of important recurrent issues and areas of concern

FACT SHEET 1: RAIB INVESTIGATIONS INVOLVING THE SAFETY OF TRACK WORKERS DURING 2015

| Investigation | 'Headline' issues | Key safety and recommendation areas |
|--|--|--|
| Fatal accident involving a track worker near Newark North Gate station, 01/2015. | There was a breakdown in safety discipline and vigilance at the work site. | This investigation revealed the need: <ul style="list-style-type: none"> to improve work site safety discipline and vigilance, especially for teams doing routine work with which they are familiar; by undertaking re-briefing and training of staff, actively monitoring safety discipline on site and investigating ways of improving vigilance on repetitive tasks. to improve the implementation of procedures for planning safe systems of work so that the method of working that is chosen minimises the risk to track workers so far as is reasonably practicable (as intended by the procedure). |
| Accident involving a track worker near Redhill, 06/2015. | The section supervisor did not remain in a position of safety until the train had passed. In addition, the cess was narrow and treacherous at this location. | This investigation revealed the need: <ul style="list-style-type: none"> to assess the availability and suitability of the locations that are required to be used as a position of safety when working on lines that are still open to traffic; for employers to emphasise the importance, for everyone's safety, of not working in dangerous locations, and the responsibility of individuals to identify when the working environment is, or becomes, unsafe; and to remind drivers that the warning provided to the first track worker encountered may not be sufficient for the whole of a group that may be spread along the line. It also confirmed the value of trained first aiders in track gangs. |
| Near miss involving track workers near Hest Bank, Lancashire [potential multiple fatality accident] 08/2015. | The lookout did not operate special equipment that had been provided to alert the gang to the approach of the train. | This investigation revealed the need: <ul style="list-style-type: none"> to mitigate risk associated with extended warning times when the sighting of approaching trains is very good; to carry out research to understand the extent to which people are able to maintain the level of constant vigilance needed for some railway activities; and to mitigate risk of high reliance on a single lookout. |
| Runaway of 'iron men' trolleys and subsequent near-miss at Raven level crossing, Carmarthenshire, 13/2015. | Track workers lost control of speed of the rig on long descending gradient. | This investigation revealed the need: <ul style="list-style-type: none"> to improve the planning of work activities involving manually propelled plant; for a review of the rules governing the use of such equipment; for a risk assessment of the braking system on the type of iron men involved in the runaway; and for revised and improved guidance on the design, testing and use of braking systems used on manually propelled plant. |
| Class investigation into irregularities with protection arrangements during infrastructure engineering works, 14/2015. | Class investigation into numerous irregularities. | This investigation revealed the need to evaluate the impact of the new Planning and Delivery of Safe Work initiative and to consider inclusion of staff activities not currently included in the initiative (eg actions of signallers and persons in charge of possessions). |
| Near misses involving construction workers at Heathrow Tunnel Junction, 20/2015. | <u>Incident on 27/12/2014</u> Engineering Supervisor permitted line to be re-opened to traffic while the COSS believed that the line remained closed. <u>Incident on 28/12/2014</u> Track worker placed trolley on line while unaware that it remained open to traffic. | On major railway infrastructure construction sites that are adjacent to railway lines there is a need for: <ul style="list-style-type: none"> more effective monitoring of on-site activities; improved arrangements for controlling access onto lines which are closed to regular train traffic; and more effective use of signage to alert construction workers of adjacent lines that are open to traffic. |

Track Quality

During 2015 RAIB published four investigation reports involving poor track quality and started two more. Of these six, two involve issues of track quality alone while in the other four cases track quality and the condition of the vehicles combined to cause a derailment. (Since the condition of rolling stock can also be the major factor in derailments, the specific impact of this is captured in fact sheet 2.) The nature of the track quality issues we have seen during 2015 highlight previous concerns expressed by RAIB about the management of recurrent track faults such as twist and *cyclic top*.



Areas of particular concern to RAIB

As in 2014, RAIB is still concerned about the number of investigations in which trains, particularly freight trains, derail on track that had been known to be defective for a considerable period of time. This was a factor in three investigations published during 2014 and has since reappeared as a factor in two investigations: Paddington (03/2015) and Heworth (16/2015).

The investigation into the derailment at Paddington revealed that a track defect had been repeatedly identified by Network Rail's measurements of *track geometry* for three years. However, the required processes to rectify the defect were not followed and this was not picked up by Network Rail's assurance regime.

At Heworth a cyclic top defect was identified that required an emergency speed restriction to be put in place but no such action was undertaken. An underlying cause of the accident was that the local track maintenance team was unable to cope with the volume of work it had to do. This was due to a combination of factors:

- reduced numbers of track maintenance staff over a long period of time;
- changes to the arrangements for working safely while on the track;
- restrictions on gaining access to the track; and
- changes to how the track was inspected.

4 Identification of important recurrent issues and areas of concern

A further underlying cause was that Network Rail's audit and self-assurance processes did not alert senior management to the extent of non-compliances to maintenance processes. They also did not trigger earlier action to resolve persistent problems affecting the track assets in the local track maintenance team's area. As such issues went undetected for a prolonged period of time.

Railway industry initiatives to improve track quality

Network Rail has informed RAIB that it has established a programme to develop the technical competence of its Track Maintenance Engineers (TMEs). This training is intended to equip TMEs with the underpinning knowledge that is needed to identify and manage track defects. We believe this to be an important initiative which will help to address issues that have been identified following a number of recent investigations (examples include the derailment at Liverpool Street station (27/2014), and the derailment at Porthkerry (10/2015)).

RAIB also notes that Network Rail is improving its systems to monitor the geometry of track in areas not covered by measurement trains (such as the immediate approaches to major stations). This should help to address issues identified at Liverpool Street station (27/2014), Paddington (03/2015) and Angerstein Junction (11/2015).

Previous investigations have identified a need to consider whether *track twist* should be measured over a different wavelength to the three metres length that is currently used as the standard (ie Primrose Hill/Camden Road West Junction (21/2014), and Angerstein Junction (11/2015)). RAIB is therefore pleased that this has been identified as a topic for consideration by the [Cross-Industry Freight Derailment Working Group](#).

FACT SHEET 2: RAIB INVESTIGATIONS INVOLVING TRACK QUALITY DURING 2015

| Investigation | 'Headline' issues | Key safety and recommendation areas |
|---|---|---|
| Derailment of an empty passenger train at London Paddington station, 03/2015. | Combination of twisted track and incorrect set-up of train bogies. | This investigation revealed the need: <ul style="list-style-type: none"> • for effective action to address track twist once it has been identified. |
| Derailment at Porthkerry, South Wales, 10/2015. | Break up of rail underneath train. | This investigation revealed the need: <ul style="list-style-type: none"> • for a review of the methods used to verify the condition of rail with suspected 'vertical longitudinal split' type defects; • for measures to ensure safe re-use of rail (particularly rail manufactured before 1976); and • for improved detection of surface breaking cracks and head spread in rails. |
| Freight train derailment at Angerstein Junction, 11/2015. | Combination of twisted track, wagon defects and offset residual load. | This investigation revealed the need: <ul style="list-style-type: none"> • to review the processes used to manage track geometry in sidings and connections on the approach to running lines; and • to review whether the existing three metre base used for the identification of track twist is sufficient for managing derailment risk. |
| Freight train derailment at Heworth, Tyne and Wear, 16/2015. | Poor track condition combined with defective wagon suspension. | This investigation revealed the need: <ul style="list-style-type: none"> • to identify and rectify excessive workload due to insufficient resource for improved management of recurrent track faults; • to identify any long-standing under-performance of track maintenance teams and to take action to address deficiencies; and • for consideration of drainage in areas of poor track quality. |
| Derailment at Washwood Heath West Junction, 01/2016. | Defective wagon combined with incorrectly installed base plates. | This investigation revealed the need: <ul style="list-style-type: none"> • for correct installation of track components during maintenance activities (eg specialist base plates on crossovers with designed twist). |
| Derailment of a freight train near Langworth on 30/06/2015 (ongoing). | Track buckle on hot day. | This investigation revealed the need: <ul style="list-style-type: none"> • to ensure that stress is restored to track after alterations; and • to prepare for hot weather (eg by providing sufficient ballast shoulders, particularly in areas of point work). |

4 Identification of important recurrent issues and areas of concern

Freight train condition

Freight train condition covers a wide variety of potential issues but those that have been of concern to RAIB during 2015, in part due to their recurrence, include:

- unevenly distributed loads;
- poorly designed container retention devices (spigots); and
- design and maintenance of vehicles.

As fact sheet 3 shows, four reports and one bulletin were published in 2015 where the condition of freight trains was an issue. A further report was published early in 2016 and another report remains ongoing. One incident at Millbrook (on 26/11/2015), not investigated by RAIB, reinforces earlier learning.

Areas of particular concern to RAIB

Unevenly distributed loads

Examples of the problems caused by unevenly distributed loads can be seen over a number of years and they appear periodically in RAIB reports. These include derailments at:

- Duddeston Junction (16/2008)
- Santon near Foreign Ore Branch Junction (10/2009)
- Reading West Junction (02/2013)
- Primrose Hill/Camden Road West Junction (21/2014)

The freight train derailment at Angerstein Junction (11/2015) also occurred, in part, as a result of an unevenly distributed load. This was due to residual load that had adhered to the side of the wagon and had not been dislodged during unloading (this was compounded by uneven loading across the wheels of a bogie and twisted track).

Last year's Annual Report highlighted the risk that can arise when a wagon's weight is not evenly distributed among its wheels. Reasons for this include an unevenly distributed payload, a twisted frame, a twisted bogie or other wagon defects, (such as seized suspension, or degraded bogie pivots). The report also highlighted that some types of wagon with particularly stiff frames may be more susceptible to derailment on twisted track. Some of these factors continue to recur:

Unevenly distributed payload (both longitudinal and lateral)

- Angerstein Junction (11/2015).
- Derailment in sidings at Millbrook (26/11/2015, not investigated).

Twisted bogie

- Angerstein Junction (11/2015).

Seized suspension

- Freight train derailment at Angerstein Junction on 03/06/2015 (ongoing).

Degraded bogie pivot

- Washwood Heath West Junction (01/2016).

Unevenly distributed payloads are a particular problem for container wagons. This is because it is very difficult for a rail freight company to control the distribution of weight inside a container and also because there are no measures in place to prevent a heavily loaded 'short' (eg 20 foot) container being loaded next to an empty 'long' (eg 40 foot) container, thereby creating a longitudinal imbalance of weight distribution between the two bogies. A recent derailment in the sidings at Millbrook (on 26/11/2015) which involved an unevenly loaded container, reinforced the need for this risk to be better understood and managed.

Spigots

The spigots of FEA wagons were a factor in the container detachments at Scout Green and Deeping St Nicholas (19/2015). The spigots on FEA-B and FEA-S wagons did not work as envisaged by the UIC standard because they were designed to rotate inwards beyond the permitted two degrees of rotation.



The circumstances of these events in 2015 were very similar to other container detachments at Hardendale and Cheddington in 2008 which were investigated by RAIB. Although the subsequent report (12/2009) acknowledged the need for short-term measures to manage the risk of deficient spigots it also recommended that modifications be made so that the spigots would operate as designed. It is disappointing to RAIB that by the time of the incidents at Scout Green and Deeping St Nicholas these modifications had still to be implemented.

General condition and maintenance of freight wagons

Two investigation reports published during 2015 highlighted significant deficiencies in the condition and maintenance arrangements of a number of freight wagons.

During the investigation into the derailment at Heworth (16/2015) the wagon that derailed was found to have a worn suspension component which made the leading left-hand wheel susceptible to unloading when responding to dips in the track. The wagon's maintenance regime had not identified this worn component. As a result RAIB recommended that the freight operator should amend its vehicle maintenance instructions for its fleet of PCA wagons to enable it to identify those wagons which have had levels of damper pad wear that exceed the permitted wear limit since the last examination, and then to implement suitable risk control measures.

At Washwood Heath (01/2016) the maintenance of wagons was again found to be an issue. While there was track twist at this location, it is the case that a wagon should be capable of negotiating twist of a magnitude at which the track standard allows the line to remain open to traffic. On this occasion, when tested, the wagon which derailed was found not to meet the requirements of the relevant Railway Group Standard for resistance to derailment due to track twist. This was because a component on the centre pivot of the bogie was found to be worn beyond its maintenance limit. This had restricted the freedom of the bogie to rotate, increasing its rotational stiffness. It also caused increased wheel unloading on track twists. Both of these factors reduced the wagon's ability to resist derailment, causing it to derail when it encountered the track twist.

4 Identification of important recurrent issues and areas of concern

The Washwood Heath report also noted that, following another derailment at Doncaster on 11 April 2015, the wagon owner instigated a check of part of its UK fleet which revealed that a number of other wagons of the same type had similar issues.

The Washwood Heath investigation raises concerns about the extent to which the current regulations for freight wagon maintenance, as laid down in the Railways and Other Transport Systems Regulations, are being correctly applied. These regulations require that the responsibility for any freight wagon's maintenance falls to a certificated entity in charge of maintenance (ECM). This entity is required to have a system of maintenance in place that allows vehicles to be safely maintained. Such a system must include instructions on the periodicity of certain examinations and renewals as well as arrangements for checking that others undertaking maintenance activities are correctly implementing the maintenance regime.

The above arrangements had not been correctly established by the ECM for the wagon that was later to derail at Washwood Heath. This gap in the safety regime was the subject of a specific recommendation to the entity concerned. However, RAIB will be examining carefully the wider implementation of the ECM regime in any future investigations where freight wagons are found to be deficient, particularly in those cases where the ECM for a wagon operating in the UK is located in another EU member state.

Railway industry initiatives

RAIB is pleased to learn that FEA wagons with spigots that do not comply with the UIC standard on container retention are now being modified. If these modifications meet their intent, it is hoped that the risk of containers being blown off the back of freight trains can be greatly reduced.

RAIB understands that Network Rail is now working with railway freight companies and Huddersfield University to explore the potential for its new wheel load impact detectors (the GOTCHA system, which replaced Wheelchex) to provide data on wheel loading to operators and maintainers of wagons. This would enable the early detection of uneven wheel loading due to factors such as defective suspension or twisted frames/bogies.

RAIB notes the work being undertaken by the cross-industry freight derailment working group that has been established to examine freight train derailment risk, and to identify potential risk control measures (this work was launched in response to a recommendation made by the RAIB following the derailment of a container train at Camden Road in October 2013, [21/2014](#)). An early activity of this group is for the industry to understand the hazards and risks and to identify potential gaps in the existing control measures. Future areas of work of particular interest to RAIB include:

- consideration of an additional wavelength for the assessment of track twist;
- guidance on loading assumptions to be used for wagon testing;
- consideration of offset loading limits (with reference to recent UIC research);
- establishing existing levels of off-set loading on wagons; and
- rules and regulations for the loading of containers.

All of the above topics are worthy of consideration. However, RAIB hopes that a detailed analysis of each of the above will not unduly delay the identification of practicable measures to reduce the risk associated with the combinations of longitudinal and lateral offsets in loads that might reasonably be encountered by container wagons, particularly those with stiffer frames.

FACT SHEET 3: RAIB INVESTIGATIONS INVOLVING FREIGHT TRAIN CONDITION DURING 2015

| Investigation | 'Headline' issue | Key safety and recommendation areas |
|--|--|---|
| Freight train derailment at Angerstein Junction, 11/2015. | Twisted track combined with wagon defect and offset residual load. | This investigation revealed the need: <ul style="list-style-type: none"> for new measures to control the risk from residual, unevenly distributed, loads in aggregate wagons; and to review the extent to which diagonal wheel unloadings are present within freight wagons due to factors such as bogie frame twist, and to propose proportionate measures to manage the risk. The investigation also revealed the potential: <ul style="list-style-type: none"> for using data from the new build of wheel impact detectors to inform wagon operators about wagon with uneven wheel loading. |
| Freight train derailment at Heworth, Tyne and Wear, 16/2015. | Poor track condition combined with wagon suspension defect. | This investigation revealed the need to mitigate the risk of a wagon's ride performance being degraded by defective suspension components. |
| Trains struck platform at Moston, Manchester, 17/2015. | Unstowed spigot struck platform (foul of gauge). | This investigation revealed the need to mitigate the risk from unstowed hinged spigots fouling the train's gauge (through measures to prevent spigots from being left in an unstowed position or improving the conspicuity of unstowed spigots so they are identified during train preparation). |
| Container detachments at Scout Green and Deeping St Nicholas, 19/2015. | Excessive wind load. | This investigation revealed the need to reinforce earlier learning on the need to replace incorrectly designed spigots that are intended to prevent detachment of containers in high winds. These incidents also demonstrate the vulnerability of existing operational risk control measures and reliance on weather forecasts. |
| Derailment of a freight train at Ashburys, Manchester, <i>bulletin B02/2015</i> . | Cracked wheel due to dragging brakes. | This investigation revealed the need to implement measures so staff who undertake the examination of freight trains will identify the signs of wheels overheating due to defective brakes. |
| Derailment at Washwood Heath West Junction, 01/2016. | Excessively worn bogie centre pivot liner. | This investigation revealed the need: <ul style="list-style-type: none"> for ECMs to ensure that the frequency of inspections and renewals is based on a sound understanding of how components wear in service; and for effective monitoring by ECMs of work undertaken by others on their behalf. |
| Freight train derailment at Angerstein Junction on 03/06/2015 (ongoing). | Suspension stuck in loaded position (causing excessive wheel unloading). | This investigation revealed the need: <ul style="list-style-type: none"> to assess the value of track-side systems that are used for measuring wheel impacts as a source of information on uneven wheel loading; and to mitigate the risk of derailment from worn suspension components on Y25 bogies. |
| Freight train derailment at Millbrook on 26/11/2015 (siding derailment, not investigated by RAIB). | Twisted track combined with a wagon which was asymmetrically loaded. | Reinforces earlier learning on the increased propensity of asymmetrically loaded container wagons to derail on twisted track. |

4 Identification of important recurrent issues and areas of concern

Platform train interface

By 31 December 2015, RAIB had published 12 reports and one bulletin into accidents to passengers at the platform train interface (PTI) associated with the movement of trains or trams (a number of which are listed in the fact sheet 4). While no new reports were published during 2015 there were three investigations into PTI incidents that were ongoing at 31 December 2015:

- Passenger trapped in train doors and subsequently dragged under train at West Wickham station (03/2016)
- Passenger dragged and fell between train and platform at Clapham South station (04/2016)
- Passenger trapped in train doors and subsequently dragged along platform at Hayes & Harlington station on 25/07/2015 (ongoing)

These serious accidents highlight some of the key issues involving the PTI. They all involved passengers being trapped in train doors and subsequently dragged along the platform; and on two occasions this resulted in those concerned falling beneath the train. One of the accidents (at West Wickham station) resulted in a passenger receiving life-changing injuries.

Areas of particular concern to RAIB

Key areas of concern following recent investigations into accidents at the PTI include:

- Following testing by RAIB, it has been discovered that some types of trains have door control systems that do not disable the opening of doors by passengers after the driver has initiated the closure sequence, so creating a risk of trapping (West Wickham, 03/2016).
- There is a widespread misunderstanding about the sensitivity of train door control systems to the presence of trapped objects and this has led some staff to conclude that the presence of objects such as hands between the leaves of closed doors will always be detected. Since this is not the case for the majority of train door control systems, it is important for the industry to explain the importance of always carrying out a final safety check after the doors are detected as closed (Hayes & Harlington, 25/07/2015 (ongoing)).

Both of the above findings have led RAIB to issue urgent safety advice notices to industry.

A number of recent investigations into accidents at the PTI suggest that there is a need for the industry to understand how passengers interact with door systems. In particular to what extent is passengers' behaviour affected by the belief that train doors will behave like lift doors (ie they will reopen if obstructed). It is also relevant to note that passengers who become trapped in train doors will often not struggle to pull themselves free until the train starts to move. This behaviour is possibly reflecting an expectation that their presence in the doors will be detected.

Understanding how passengers interact with train doors may point to new ways of improving safety by:

- seeking to modify passenger behaviours; and
- adapting the design of train door systems.

Railway industry initiatives to address PTI risk

Following the issue of urgent safety advice notices by RAIB, rolling stock owners have identified 22 vehicle classes that currently allow the opening of doors by passengers after the driver has initiated the door closure sequence. Affected rolling stock owners are jointly commissioning a review of the practicability of suitable modifications to remove, or reduce the associated risk.

The cross-industry PTI strategy group (described in last year's Annual Report) is overseeing some important research projects in the following areas:

- RSSB Research project T1029 – Designing a tool to support duty holders in the assessment of platform/train interface risk.
- RSSB research project T1080 – Understanding the influence of different edge step/gap arrangements on boarding and alighting accidents.
- RSSB research project T1054 – Evaluating platform gap fillers, and assessing their range of applications and suitability for the GB network, to reduce risk at the train/platform interface.
- RSSB research project T1062 – Platform recess – looking at the optimum arrangement for the under-platform recess, results to be incorporated in the PTI strategy and revised Railway Group Standards.

4 Identification of important recurrent issues and areas of concern

FACT SHEET 4: RAIB INVESTIGATIONS INTO ACCIDENTS INVOLVING PASSENGERS AND MOVING TRAINS AT STATIONS, DURING 2015

| Investigation | 'Headline' issues | Key safety and recommendation areas |
|--|--|--|
| <p>Previous investigations 2005-2014:</p> <p><i>Passenger accident at Brentwood station, 19/2011.</i></p> <p><i>Fatal accident at James Street station, Liverpool, 22/2012.</i></p> <p><i>Person trapped in a train door and dragged at Jarrow station, 26/2012.</i></p> <p><i>Accident at Charing Cross station, 10/2013.</i></p> <p><i>Wheeled transport rolling off platforms at Southend and Whyteleafe, 17/2014.</i></p> <p><i>Passenger trapped in a train door and dragged a short distance at Newcastle Central station, 19/2014.</i></p> <p><i>Passenger dragged a short distance by a train at Holborn station, 22/2014.</i></p> | | <p>Previous investigations revealed the need for:</p> <ul style="list-style-type: none"> enabling dispatchers to observe the platform train interface for as long as possible, ideally until the train has left the platform; enabling dispatchers to stop trains quickly in an emergency (including after the signal to start has been given); adapting trains and/or platforms to reduce the platform edge gap; systematic assessment of dispatch risk at each platform; design and testing of train door obstruction detection systems; improved information on door trapping incidents; management of the risk at platforms that slope towards the track; and passenger awareness of PTI risk. |
| <p>Passenger dragged and fell between train and platform at Clapham South station, 04/2016.</p> | <p>Passenger's coat trapped in doors of train which was subsequently driven out of platform.</p> | <p>This investigation revealed the need:</p> <ul style="list-style-type: none"> for a risk assessment of the risk of train dispatch, particularly when platforms are crowded, and the identification of suitable risk control measures (eg altered camera positions). |
| <p>Passenger trapped in train doors and subsequently dragged under train at West Wickham station, 03/2016.</p> | <p>Neither driver was aware of the passenger trying to free her trapped backpack when the train doors were closing, or subsequently while despatching the train from the platform.</p> | <p>This investigation revealed the need:</p> <ul style="list-style-type: none"> for a review of the design of certain types of door control systems to prevent doors being opened by passengers after the driver has initiated the closure sequence; and to reinforce the requirement for people involved in train dispatch to undertake the train safety check after train doors have closed. |
| <p>Passenger trapped in train doors and subsequently dragged along platform at Hayes and Harlington station on 25/07/2015 (ongoing).</p> | <p>Train departed with a passenger's hand trapped in the train's doors.</p> | <p>This investigation revealed the need:</p> <ul style="list-style-type: none"> to ensure that dispatchers (particularly train drivers) understand that door interlock can be obtained with a hand trapped between the door's leaves (reinforces the need for dispatchers to undertake an adequate final safety check after doors closed); and to improve the initial investigation of accidents by train operators. |

Level crossings



Level crossing safety remains a priority for the railway industry. Last year’s Annual Report highlighted the issues that have emerged from recent investigations and some of the ongoing activities that are intended to reduce the current levels of risk. During 2015 RAIB published one report into a level crossing accident.

This related to a fatal collision between a train and a trail bike on a bridleway crossing at Frampton in Gloucestershire (05/2015). Issues identified included the need for infrastructure managers to understand:

- the ways in which level crossings are regularly used by those without the authority to do so (in this instance, trail bikers); and
- the ways in which users can be better alerted to any types of vehicles that are forbidden to use a crossing.

During 2015 RAIB also started an investigation into a collision between a train and a tractor at Oakwood Farm crossing in Yorkshire (since published, 07/2016).

RAIB observes that Network Rail is continuing to work to address level crossing risk and has been allocated a ring-fenced fund of £99 million to invest in closing and upgrading during CP5 (2014-19). It has also completed its recruitment of over a 100 dedicated level crossing managers.

Although it is encouraging to note that Network Rail is committed to continue its programme of level crossing closures (more than 800 have now been closed since 2010), level crossings will remain a feature of the UK’s railways into the foreseeable future. It is therefore important that the industry continues to work to address some of the areas of weakness in existing risk control measures that have been identified in RAIB investigations. In particular, the poor audibility of train horns on the approach to certain footpath and bridleway crossings, and the need to review how the occupants of road vehicles interact with user worked crossings (including the sighting of approaching trains from inside road vehicles). With regard to the first of these, RAIB is following with interest Network Rail’s testing of audible alarms located at certain level crossings to supplement the sound of the train horn.

Network Rail has informed RAIB that the closure of level crossings is becoming increasingly difficult. It is often the case that delays occur while seeking planning approvals, often in the face of local opposition.

4 Identification of important recurrent issues and areas of concern

Earthworks and structures

Previous annual reports have reflected on the need for improved management of earthworks and procedures for managing the potential consequences of severe weather events. It is therefore very pleasing to note that despite two exceptionally wet winters (2013-14 and 2015-16), and a large number of reportable slips, there have been no train derailments caused by earthwork failures since Bargoed in January 2013 (described in class investigation [08/2014](#)). This suggests that the improved arrangements for managing the risk of extreme weather events that were reported in RAIB's class investigation into earthworks have proved effective.

The failure of the viaduct at Lamington on 31 December 2015, which closed the west coast main line for seven weeks, is a reminder that damage to structures at times of heavy rainfall can pose a serious risk to trains. The ongoing RAIB investigation is examining whether more should have been done to protect trains and the adequacy of the current regime for monitoring the condition of vulnerable structures.

Other areas of concern

RAIB’s investigations sometimes shed light on some less obvious areas of risk which it wishes to bring to the attention of the railway industry and ORR. Those identified during 2015 are included in Table 8 below:

Table 8 – Areas of concern

| Area of concern | References |
|--|--|
| Weaknesses in safety validation of the design of rolling stock, plant and machinery (particularly when modifications are carried out). | Collision of a <i>road rail vehicle</i> with a buffer stop at Bradford Interchange station (09/2013). Runaway of an on-track machine at Bryn (09/2016). Fire on board a freight shuttle in the Channel Tunnel on 17/01/15 (joint investigation with BEA-TT, published 05/05/2016). Train struck and damaged by equipment cabinet door in Watford Tunnel (12/2015). Collision between a train and a tractor at Oakwood Farm user worked crossing (07/2016). |
| The robustness of safety management systems for certain ‘minor operators’ who are authorised to operate on the national network. | Signal passed at danger at Stafford (16/2013). Signal passed at danger on the approach to Wootton Bassett Junction (08/2016). |
| The tension between the need for safe access to tracks for maintenance and the operation of train services on a busy network. | Fatal accident involving a track worker near Newark North Gate station (01/2015). Accident to a track worker near Redhill (06/2015). Engineering protection irregularities - class investigation (14/2015). |
| The potential for accidents caused by signaller error, or miscommunications, when establishing short-term blockages of the line to enable access by track workers. | Engineering protection irregularities - class investigation (14/2015). |
| Ineffective implementation of the new regime governing the activities of Entities in Charge of Maintenance (for freight rolling stock). | Derailment at Washwood Heath West Junction (01/2016). |

5 Other Activities and Information about the Branch

National Investigation Body (NIB) Network

We continue to participate in the European Union (EU) Network of NIBs and have provided extensive input into the revision of the EU Railway Safety Directive.

As a result of the proposed changes to the Directive we are now working with a number of other NIBs to develop the means of implementing these changes, in particular in the areas of:

- a) a peer review process; and
- b) a revised structure and content of investigation reports.

In addition, we are working with the NIBs and the ERA to improve the management of plenary meetings to establish mechanisms for co-operation.

Some years ago we were also invited to participate in the Nordic regional grouping of NIBs and we continue to be an active member of this group.

Accident investigation good practice workshop

The workshop, initiated by RAIB in 2014 continues to meet. Representatives from RAIB, RSSB, train operators and freight operators met on 29 April and 13 November 2015 to participate in a forum for the exchange of good practice in the field of railway accident investigation. All agreed that the workshop was valuable.

International Transport Safety Association (ITSA) conference May 2015

On 11 & 12 May 2015 RAIB hosted the ITSA conference in London and representatives from 16 countries attended.

ITSA is composed of the independent investigation boards from countries around the world and its mission is to improve transport safety in each member country by sharing information and learning from the experience of others.

Papers and presentations

Given the nature of our work, RAIB staff are sometimes invited to speak at, or submit papers to, conferences and events. A selection of material (as listed below) submitted or presented by RAIB in 2015 is now placed on our website.

| Date of event | Title | Event/conference |
|---------------|---|---|
| 23/04/2015 | How accident investigation can drive research | Stephenson Conference, IMechE |
| 14/09/2015 | Fatigue: identification, management and countermeasures | Fifth International Rail Human Factors Conference, London, RSSB |
| 05/11/2015 | RAIB investigations involving freight trains – current areas of concern | 4th Risk Management Seminar DB Schenker |

RAIB's own safety record

RAIB provides an operational response to railway accidents and incidents, which vary in nature, scale and environment. These operations often present significant health and safety risks to RAIB staff and to people working alongside them. To counter these risks, RAIB has revised its own Safety Management System (SMS). This identifies RAIB's health & safety policy and the arrangements that it has in place for the management of risk. It also sets out a system for the 'real-time' assessment of risk by means of a process known as Dynamic Risk Assessment.

RAIB monitors its own health and safety performance as an integral part of our management and governance processes. This includes a Health, Safety and Welfare committee which is chaired by the Chief Inspector.

One RIDDOR reportable injury was reported during the year. The accident involved a contractor falling from a step ladder while working at our Farnborough office. It was recorded using the DfT on-line tool and was investigated and actions taken to prevent a recurrence. In addition three minor incidents were also recorded and closed.

Funding

RAIB's budget for 2015-16 was £4.8 million. This will reduce to £4.7 million for 2016-17.

Appendices

Appendix A - Narrowly avoided multiple fatality accidents

Eight events in 2014 and 2015 where RAIB considers that a multiple fatality accident was narrowly avoided:

| Investigation name | Report Number | Incident details |
|--|---------------|--|
| Near miss involving track workers near Hest Bank. | 08/2015 | Group of nine workers, with less than two seconds to spare, leaped out of way of train travelling at 98 mph. |
| Runaway of 'iron men' trolleys and subsequent near miss at Raven level crossing. | 13/2015 | Runaway trolleys narrowly missed group of four working at level crossing. |
| Collision between a train and a collapsed signal post at Newbury. | 15/2015 | A passenger train hit a fallen signal post at 110 mph without derailing. |
| Container detachments at Scout Green and near Deeping St Nicholas. | 19/2015 | Container detachments which passed over (or fouled) opposite line. |
| Unsafe events at Heathrow Tunnel Junction. | 20/2015 | Near miss involving a group of staff, and collision with trolley in which staff jumped clear. |
| Collision between a train and a fallen bridge parapet at Froxfield. | 02/2016 | Train struck fallen masonry at 90 mph, no derailment. |
| Passenger train derailment at Godmersham. | 05/2016 | Passenger train struck a number of cows and subsequently derailed. |
| SPAD on the approach to Wootton Bassett Junction. | 08/2016 | SPAD and near miss at a high-speed junction, involving two passenger trains. |

Appendix B - Summary of recommendation status 2015

Includes the status of recommendations that were made or changed during 2015, or which remain open as at 31 December 2015.

Key

| | |
|--|--|
| | Recommendations made prior to 2015 that remain open |
| | Recommendations made during 2015 |
| | Recommendations implemented during 2015 |
| | Recommendations reported as 'non-implementation' during 2015 |
| | Recommendations where status changed during 2015 |

Where RAIB has concerns, based on the risk, over the way that an organisation has responded to the recommendation, RAIB raises these concerns with the relevant safety authority and the responses are marked with a coloured triangle. We may also add a comment and this will appear in the recommendation response report.

The triangles used are as follows:

- ▲ RAIB has particular concerns that no actions have been taken in response to a recommendation.
- ▲ RAIB has concerns that the actions taken are inappropriate or insufficient to address the risk identified during the investigation.
- △ RAIB notes that substantive actions have been reported but RAIB still has concerns.

Recommendations made prior to 2015, where RAIB had concern with the status reported, are also denoted with coloured triangles. Unless RAIB becomes aware of further information then triangles will not be changed or removed.

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|------------------------------|--|
| The derailment of a freight train at King Edward Bridge, Newcastle | 02/2008 | 10/05/07 | 2 | Impl. by alt. means | | Network Rail | Recommendation(s) and Status Report: King Edward Bridge |
| Collision between train and tractor on crossing XL202 near Limavady Junction, Northern Ireland | 10/2008 | 02/08/07 | 5 | In-progress | | Northern Ireland Railways | Recommendation(s) and Status Report: Limavady Junction, Northern Ireland |
| Derailment at Grayrigg | 20/2008 | 23/02/07 | 1 | Implemented | | Network Rail | Recommendation(s) and Status Report: Grayrigg |
| Signal passed at danger and subsequent near miss at Didcot North junction | 23/2008 | 22/08/07 | 2 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Didcot North junction |
| Derailment at Santon near Foreign Ore Branch Junction, Scunthorpe | 10/2009 | 25/01/08 | 7 | Implemented | | Network Rail | Recommendation(s) and Status Report: Foreign Ore Branch Junction, Scunthorpe |
| Investigation into safety at user worked crossings | 13/2009 | 13/06/08 | 6 | Impl. ongoing | | Northern Ireland Railways | Recommendation(s) and Status Report: User worked crossings |
| | | | 8 | Impl. ongoing | | RSSB | |
| Collision between passenger train and two rail-mounted grinding machines at Acton West | 15/2009 | 24/06/08 | 3 | In-progress | | Network Rail | Recommendation(s) and Status Report: Acton West |
| | | | 6 | In-progress | | | |
| Track worker struck by train on Grosvenor Bridge, London Victoria | 19/2009 | 13/11/07 | 6 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Grosvenor Bridge, London Victoria |
| Collision with debris from bridge GE19 near London Liverpool Street | 22/2009 | 28/05/08 | 6 | In-progress | | Health and Safety Executive | Recommendation(s) and Status Report: London Liverpool Street |
| Double fatality at Bayles & Wylies footpath crossing, Nottingham | 32/2009 | 22/11/08 | 6 | Implemented | | Network Rail | Recommendation(s) and Status Report: Bayles & Wylies footpath crossing, Bestwood, Nottingham |
| | | | 7 | Impl. ongoing | | RSSB | |
| Collision on the Great Orme Tramway | 13/2010 | 15/09/09 | 2 | In-progress | | Conwy County Borough Council | Recommendation(s) and Status Report: Great Orme Tramway |
| Fatal accident at Halkirk level crossing, Caithness | 16/2010 | 29/09/09 | 6 | Implemented | | Network Rail | Recommendation(s) and Status Report: Halkirk level crossing, Caithness |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|--|---|
| Fatal accident at Moreton-on-Lugg, near Hereford | 04/2011 | 16/01/10 | 1 | Impl. ongoing | Δ Blue | Network Rail | Recommendation(s) and Status Report: Moreton-on-Lugg |
| | | | 2 | In-progress | | | |
| | | | 3 | In-progress | | | |
| | | | 4 | In-progress | | | |
| Track worker struck by a train at Cheshunt Junction | 06/2011 | 30/03/10 | 2 | In-progress | | Network Rail | Recommendation(s) and Status Report: Cheshunt Junction |
| | | | 1 | Impl. ongoing | | | |
| Investigation into safety of automatic open level crossings on Network Rail's managed infrastructure | 12/2011 | 02/02/10 | 4 | Implemented | | Network Rail | Recommendation(s) and Status Report: AOCL on Network Rail's infrastructure |
| | | | 2 | Impl. ongoing | | | |
| Bridge strike and road vehicle incursion onto roof of passing train near Oxshott station | 13/2011 | 05/11/10 | 4 | Impl. ongoing | | Department for Transport | Recommendation(s) and Status Report: Oxshott station |
| | | | 2 | Impl. ongoing | | | |
| Collision between an articulated tanker and a passenger train at Sewage Works Lane user worked crossing, near Sudbury, Suffolk | 14/2011 | 17/08/10 | 2 | In-progress | | Network Rail | Recommendation(s) and Status Report: Sewage Works Lane, Sudbury, Suffolk |
| | | | 1 | Implemented | | | |
| Uncontrolled freight train run-back between Shap and Tebay, Cumbria | 15/2011 | 17/08/10 | 1 | Implemented | | DB Schenker Rail (UK) Ltd (formerly EWS) | Recommendation(s) and Status Report: Shap and Tebay, Cumbria |
| | | | 3 | Impl. ongoing | | ORR | |
| | | | 4 | Implemented | | RSSB | |
| | | | 1 | Impl. ongoing | | Network Rail | |
| Derailment in Summit tunnel, near Todmorden, West Yorkshire | 16/2011 | 28/12/10 | 3 | In-progress | | Network Rail | Recommendation(s) and Status Report: Summit tunnel, Todmorden, West Yorkshire |
| | | | 1 | Impl. ongoing | | | |
| Train passed over Lydney level crossing with crossing barriers raised | 20/2011 | 23/03/11 | 3 | In-progress | | Network Rail | Recommendation(s) and Status Report: Lydney level crossing |
| | | | 1 | Impl. ongoing | | | |
| Two incidents involving track workers between Clapham Junction and Earlsfield | 03/2012 | 08/03/11 | 3 | In-progress | | Network Rail | Recommendation(s) and Status Report: Clapham Junction and Earlsfield |
| | | | 4 | In-progress | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|---|-------------------------|------------|------------|--|-----------------------|------------------------------------|--|
| Partial failure of Bridge 94, near Bromsgrove | 05/2012 | 06/04/11 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Bridge 94, near Bromsgrove |
| | | | 2 | Implemented | | | |
| | | | 3 | Impl. ongoing | | | |
| Fatal accident at Piccadilly Gardens, Manchester | 08/2012 | 05/06/11 | 1 | Impl. ongoing | | UK Tram Ltd (aka Light Rail Group) | Recommendation(s) and Status Report: Piccadilly Gardens, Manchester |
| | | | 2 | In-progress | | | |
| Person trapped in doors and pulled along platform at King's Cross station, London | 09/2012 | 10/10/11 | 1 | Implemented | | Porterbrook | Recommendation(s) and Status Report: King's Cross station, London |
| Fatal accident at Mexico footpath crossing (near Penzance) | 10/2012 | 03/10/11 | 2 | In-progress | | RSSB | Recommendation(s) and Status Report: Mexico footpath crossing, near Penzance |
| | | | 3 | In-progress | | Network Rail | |
| | | | 5 | In-progress | | | |
| Incident at Llanbadarn Automatic Barrier Crossing (<i>Locally Monitored</i>) near Aberystwyth | 11/2012 | 19/06/11 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Llanbadarn Automatic Barrier Crossing, near Aberystwyth |
| Incident involving a runaway track maintenance trolley near Haslemere, Surrey | 14/2012 | 10/09/11 | 6 | In-progress | | Network Rail | Recommendation(s) and Status report: Haslemere, Surrey |
| Fatal accident Gypsy Lane footpath crossing, Needham Market, Suffolk | 15/2012 | 24/08/11 | 1 | Implemented | | Network Rail | Recommendation(s) and Status Report: Gypsy Lane footpath crossing, Needham Market, Suffolk |
| Track worker struck by a train at Stoats Nest Junction | 16/2012 | 12/06/11 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Stoats Nest Junction |
| Container train accident near Althorpe Park, Northamptonshire | 17/2012 | 18/07/11 | 2 | In-progress | | Health and Safety Executive | Recommendation(s) and Status Report: Althorpe Park, Northamptonshire |
| | | | 3 | In-progress | | | |
| | | | 1 | In-progress | | | |
| Derailment at Princes Street Gardens, Edinburgh | 18/2012 | 27/07/11 | 2 | In-progress | | Network Rail | Recommendation(s) and Status Report: Princes Street Gardens, Edinburgh |
| | | | 3 | In-progress | | | |
| | | | 4 | In-progress | | | |
| | | | 1 | In-progress | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|-----------------------------|---|
| Derailment at Bordesley Junction, Birmingham | 19/2012 | 26/08/11 | 1 | In-progress | | Network Rail | Recommendation(s) and Status Report: Bordesley Junction, Birmingham |
| | | | 2 | In-progress | | Lafarge Aggregates Ltd | |
| | | | 3 | In-progress | | | |
| Fatal accident at James Street station, Liverpool | 22/2012 | 22/10/11 | 3 | Implemented | Δ White | ORR | Recommendation(s) and Status Report: James Street station, Liverpool |
| Derailment at Bletchley Junction, Bletchley | 24/2012 | 03/02/12 | 2 | In-progress | | Network Rail | Recommendation(s) and Status Report: Bletchley Junction, Bletchley |
| Road vehicle incursion and subsequent collision with train at Stowmarket Road | 25/2012 | 30/11/11 | 3 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Stowmarket Road |
| | | | 5 | Implemented | | ORR | |
| | | | 6 | Impl. ongoing | | Health and Safety Executive | |
| | | | 7 | Impl. by alt. means | | Department for Transport | |
| | | | 8 | In-progress | | | |
| | | | 9 | In-progress | | | |
| | | | 1 | Implemented | | | |
| | | | 2 | Impl. ongoing | | | |
| | | | 4 | In-progress | | | |
| Person trapped in train door at Jarrow station, Tyne and Wear Metro | 26/2012 | 12/04/12 | 2 | Impl. ongoing | | DB Regio Tyne and Wear Ltd | Recommendation(s) and Status Report: Jarrow station, Tyne and Wear Metro |
| Fatality at Johnson's footpath crossing near Bishop's Stortford, Hertfordshire | 27/2012 | 28/01/12 | 3 | Implemented | | Network Rail | Recommendation(s) and Status Report: Johnson's footpath crossing near Bishop's Stortford, Hertfordshire |
| | | | 1 | Implemented | | | |
| | | | 2 | In-progress | | | |
| Near miss incident at Ufton Automatic Half Barrier Crossing, Berkshire | 28/2012 | 04/09/11 | 3 | Implemented | | Network Rail | Recommendation(s) and Status Report: Ufton AHB crossing, Berkshire |
| | | | 4 | In-progress | | | |
| | | | 5 | In-progress | | | |
| | | | 7 | Implemented | | | |
| | | | 2 | In-progress | | | |
| Freight train derailment at Reading West Junction | 02/2013 | 28/01/12 | 2 | In-progress | | Freightliner Group | Recommendation(s) and Status Report: Reading West Junction |
| | | | 3 | In-progress | | | |
| | | | 4 | In-progress | | Network Rail | |
| | | | 1 | Impl. by alt. means | | London Tramlink | |
| Derailment of a tram at East Croydon | 04/2013 | 17/02/12 | 2 | Implemented | | | Recommendation(s) and Status Report: East Croydon |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|---------------------------|---|
| Accident involving a pantograph and the overhead line near Littleport, Cambridgeshire | 06/2013 | 05/01/12 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Littleport, Cambridgeshire |
| | | | 2 | Impl. ongoing | | | |
| Dangerous occurrence involving track workers near Roydon station, Essex | 07/2013 | 16/07/12 | 1 | Implemented | | Network Rail | Recommendation(s) and Status Report: Roydon station, Essex |
| | | | 2 | In-progress | | | |
| Derailment of a freight train at Shrewsbury station | 08/2013 | 07/07/12 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Shrewsbury station |
| | | | 2 | Impl. ongoing | | | |
| Collision of a road rail vehicle with buffer stop at Bradford Interchange station | 09/2013 | 25/03/12 | 5 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Bradford Interchange station |
| | | | | | | | |
| Dangerous occurrence at Lindridge Farm user worked crossing, near Bagworth, Leicestershire | 11/2013 | 22/03/12 | 1 | Implemented | ▲ White | Network Rail | Recommendation(s) and Status Report: Lindridge Farm UWC, Leicestershire |
| | | | 2 | In-progress | | | |
| | | | 3 | In-progress | ▲ Blue | | |
| | | | 5 | Implemented | | | |
| Collision between stoneblower and ballast regulator near Arley, Warwickshire | 12/2013 | 10/08/12 | 1 | In-progress | | Network Rail | Recommendation(s) and Status Report: Arley, Warwickshire |
| | | | 2 | In-progress | | | |
| | | | 3 | In-progress | | | |
| Partial failure of a structure inside Balcombe Tunnel, West Sussex | 13/2013 | 23/09/11 | 1 | Implemented | | Network Rail | Recommendation(s) and Status Report: Balcombe Tunnel, West Sussex |
| | | | 2 | In-progress | | | |
| | | | 3 | Implemented | | | |
| | | | 4 | Implemented | | | |
| | | | 5 | Implemented | | | |
| | | | 6 | Implemented | | | |
| Train ran onto a washed-out embankment near Knockmore, Northern Ireland | 14/2013 | 28/06/12 | 7 | Impl. ongoing | | Northern Ireland Railways | Recommendation(s) and Status Report: Knockmore, Northern Ireland |
| | | | 8 | Impl. ongoing | | | |
| | | | 9 | Impl. ongoing | | | |
| | | | 1 | Impl. ongoing | | | |
| | | | 2 | Impl. ongoing | | | |
| 3 | Impl. ongoing | | | | | | |
| 4 | OPB response awaited | | | | | | |
| 5 | In-progress | | | | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 | |
|--|-------------------------|------------|------------|--|-----------------------|----------------------------|--|--------------------|
| Dangerous occurrence involving an engineering train at Blatchbridge Junction, near Frome | 15/2013 | 19/03/12 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Blatchbridge Junction, near Frome | |
| | | | 2 | Impl. ongoing | | | | |
| | | | 3 | Impl. ongoing | | | | |
| | | | 4 | In-progress | | Matisa | | |
| | | | 5 | Impl. ongoing | | Network Rail | | |
| Signal passed at danger at Stafford | 16/2013 | 26/04/12 | 5 | Impl. ongoing | | RSSB | Recommendation(s) and Status Report: Stafford | |
| Collision between a train and a car at Beech Hill level crossing, near Finningley | 17/2013 | 04/12/12 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Beech Hill level crossing, near Finningley | |
| | | | 2 | Impl. ongoing | | | | |
| | | | 3 | In-progress | | | | |
| | | | 4 | In-progress | | | | |
| Train fire at South Gosforth | 18/2013 | 08/01/13 | 1 | Impl. ongoing | | Nexus | Recommendation(s) and Status Report: South Gosforth | |
| | | | 2 | Impl. ongoing | | DB Regio Tyne and Wear Ltd | | |
| | | | 3 | Impl. ongoing | | Nexus | | |
| Fatal accident at Bayles and Wylies footpath crossing, Bestwood, Nottingham | 19/2013 | 28/11/12 | 1 | In-progress | | All tram operators | Recommendation(s) and Status Report: Bayles and Wylies footpath crossing, Bestwood, Nottingham | |
| | | | 2 | In-progress | | | | |
| | | | 4 | In-progress | | | | Network Rail |
| | | | | | | | | All tram operators |
| Track worker struck by a train at Bulwell, Nottingham | 20/2013 | 06/08/12 | 1 | In-progress | | Network Rail | Recommendation(s) and Status Report: Bulwell, Nottingham | |
| | | | 2 | In-progress | | | | |
| | | | 3 | In-progress | | | | |
| | | | 4 | In-progress | | | | |
| Fatal accident involving a track worker at Saxilby | 21/2013 | 04/12/12 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Saxilby | |
| | | | 2 | Impl. ongoing | | | | |
| | | | 4 | In-progress | | | | |
| | | | 1 | Impl. by alt. means | Δ Blue | | | Network Rail |
| Derailment of a freight train at Barrow upon Soar, Leicestershire | 22/2013 | 27/12/12 | 1 | Impl. by alt. means | Δ Blue | Network Rail | Recommendation(s) and Status Report: Barrow upon Soar, Leicestershire | |
| Fatal accident at Motts Lane level crossing, Witham, Essex | 01/2014 | 24/01/13 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Motts Lane level crossing, Witham, Essex | |
| | | | 2 | Impl. ongoing | | | | |
| | | | 3 | Impl. ongoing | | | | |
| | | | 4 | Impl. ongoing | | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|---|--|
| Derailment at Castle Donington, Leicestershire | 02/2014 | 21/01/13 | 1 | In-progress | | Network Rail | Recommendation(s) and Status Report: Castle Donington, Leicestershire |
| | | | 2 | Implemented | | RSSB | |
| | | | 1 | Implemented | | All infrastructure controllers | |
| | | | 2 | Implemented | | | |
| | | | 3 | Implemented | | | |
| Penetration and obstruction of a tunnel between Old Street and Essex Road stations, London | 03/2014 | 08/03/13 | 4 | Implemented | | British Standards Institution | Recommendation(s) and Status Report: Old Street and Essex Road stations, London |
| | | | 5 | In-progress | | Department for Communities and Local Government | |
| | | | 1 | Impl. ongoing | | Network Rail | |
| | | | 2 | Implemented | Δ Blue | RSSB | |
| | | | 3 | Non-implementation | | ORR | |
| Fatal accident at Athelney level crossing, near Taunton, Somerset | 04/2014 | 21/03/13 | 4 | Implemented | | Network Rail | Recommendation(s) and Status Report: Athelney level crossing, near Taunton, Somerset |
| | | | 1 | Implemented | | Tram Operations Limited | |
| | | | 2 | Implemented | | London Tramlink | |
| | | | 3 | Impl. by alt. means | | UK Tram Ltd | |
| Tram running with doors open on London Tramlink, Croydon | 05/2014 | 13/04/13 | 4 | Implemented | | Network Rail | Recommendation(s) and Status Report: London Tramlink, Croydon |
| | | | 5 | Implemented | | ORR | |
| | | | 6 | Implemented | | Tram Operations Limited | |
| | | | 7 | Implemented | | London Tramlink | |
| | | | 8 | Implemented | | Tram Operations Limited | |
| | | | 1 | Implemented | | Network Rail | |
| | | | 2 | Impl. ongoing | | RSSB | |
| | | | 3 | Impl. ongoing | | | |
| Collision at Buttington Hall user worked crossing, Welshpool | 06/2014 | 16/07/13 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Buttington Hall user worked crossing, Welshpool |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Impl. ongoing | | | |
| Locomotive derailment at Ordsall Lane Junction, Salford | 07/2014 | 23/01/13 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Ordsall Lane Junction, Salford |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | In-progress | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|--|---|
| Class investigation into landslips affecting Network Rail infrastructure between June 2012 and February 2013 | 08/2014 | 28/06/12 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Class investigation into landslips |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Implemented | | | |
| | | | 4 | In-progress | | | |
| | | | 5 | In-progress | | | |
| Passenger train collision at Norwich | 09/2014 | 21/07/13 | 1 | Implemented | | Abellio Greater Anglia Ltd | Recommendation(s) and Status Report: Norwich |
| | | | 2 | Implemented | | | |
| | | | 3 | Implemented | ▲ Blue | | |
| | | | 4 | Implemented | | | |
| Accident at Balnamore level crossing, Ballymoney, Northern Ireland | 10/2014 | 31/05/13 | 5 | In-progress | | Network Rail Abellio Greater Anglia Ltd | Recommendation(s) and Status Report: Balnamore level crossing, Ballymoney, Northern Ireland |
| | | | 1 | Impl. ongoing | | | |
| | | | 2 | Impl. ongoing | | | |
| Near-miss at Llandoverly level crossing, Carmarthenshire | 11/2014 | 06/06/13 | 3 | Impl. ongoing | | Northern Ireland Railways | Recommendation(s) and Status Report: Balnamore level crossing, Ballymoney, Northern Ireland |
| | | | 1 | Implemented | | | |
| | | | 2 | Implemented | | | |
| Near-miss at Llandoverly level crossing, Carmarthenshire | 11/2014 | 06/06/13 | 3 | Impl. ongoing | | Arriva Trains Wales Network Rail | Recommendation(s) and Status Report: Llandoverly level crossing, Carmarthenshire |
| | | | 4 | Implemented | | | |
| | | | 5 | Impl. ongoing | | | |
| | | | 6 | Implemented | | | |
| Near-miss at Butterswood level crossing, North Lincolnshire | 12/2014 | 25/06/13 | 1 | In-progress | | Network Rail Transpennine Express | Recommendation(s) and Status Report: Butterswood level crossing, North Lincolnshire |
| | | | 2 | In-progress | | | |
| | | | 3 | In-progress | | | |
| | | | 4 | Implemented | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|---|--|
| Locomotive failure near Winchfield | 13/2014 | 23/11/13 | 3 | Implemented | | West Coast Railways | Recommendation(s) and Status Report: Winchfield |
| | | | 4 | Impl. by alt. means | | Heritage Railway Association Mainline Steam Locomotive Operators Association | |
| Road vehicle incursion onto the railway at Aspatria, Cumbria | 14/2014 | 26/10/13 | 1 | In-progress | | Department for Transport | Recommendation(s) and Status Report: Aspatria, Cumbria |
| | | | 2 | In-progress | | All infrastructure controllers | |
| Runaway of a road rail vehicle and resulting collision in Queen Street High Level Tunnel, Glasgow | 15/2014 | 21/04/13 | 1 | Impl. by alt. means | | Rexquote Ltd | Recommendation(s) and Status Report: Queen Street High Level Tunnel, Glasgow |
| | | | 2 | Implemented | | | |
| | | | 3 | Implemented | | | |
| | | | 4 | Implemented | | Network Rail | |
| Uncontrolled evacuation of a London Underground train at Holland Park station | 16/2014 | 25/08/13 | 1 | Implemented | | | Recommendation(s) and Status Report: Holland Park station |
| | | | 2 | Implemented | | | |
| | | | 3 | Implemented | | | |
| | | | 4 | Implemented | | London Underground LUL | |
| | | | 5 | Implemented | | | |
| | | | 6 | Implemented | | | |
| Accidents involving a wheelchair rolling onto the track at Southend Central, 28 August 2013; and a pushchair rolling onto the track at Whyteleafe, 18 September 2013 | 17/2014 | 28/08/13 | 1 | Implemented | | Network Rail | Recommendation(s) and Status Report: Southend Central and Whyteleafe |
| | | | 2 | In-progress | | | |
| | | | 3 | Implemented | | Association of Train Operating Companies ATOC | |
| | | | 4 | Impl. ongoing | | Network Rail | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|--|--|
| Passenger trapped and dragged in train door at Newcastle Central station | 19/2014 | 05/06/13 | 1 | Impl. ongoing | | Heathrow Express (incorporates Heathrow Connect) London Midland Transpennine Express Siemens (trains & trams) RSSB | Recommendation(s) and Status Report: Newcastle Central station |
| | | | 3 | In-progress | | | |
| | | | 6 | In-progress | | | |
| | | | 1 | Implemented | | | |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Impl. ongoing | | | |
| | | | 4 | Impl. ongoing | | | |
| Freight train derailment near Gloucester | 20/2014 | 15/10/13 | 5 | In-progress | | | Recommendation(s) and Status Report: Gloucester |
| | | | 6 | In-progress | | | |
| | | | 7 | In-progress | | | |
| | | | 1 | Implemented | ▲ White | Network Rail | |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Impl. ongoing | | | |
| | | | 4 | Impl. ongoing | | | |
| Derailment at Primrose Hill/Camden Road West Junction | 21/2014 | 15/10/13 | 3 | In-progress | | Direct Rail Services Ltd RSSB | |
| | | | 1 | Implemented | ▲ White | Network Rail | Recommendation(s) and Status Report: Primrose Hill/Camden Road West Junction |
| | | | 2 | Implemented | ▲ Blue | Freightliner Group Network Rail | |
| | | | 3 | In-progress | | | |
| | | | 1 | Non-implementation | | London Underground LUL | Recommendation(s) and Status Report: Holborn station |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | In-progress | | | |
| Passenger dragged a short distance by a train at Holborn station | 22/2014 | 03/02/14 | 1 | Impl. ongoing | | Network Rail | Recommendation(s) and Status Report: Denmark Hill station |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Impl. ongoing | | | |
| | | | 4 | Impl. ongoing | | | |
| | | | 5 | Implemented | | | |
| | | | 1 | Impl. ongoing | | | |
| | | | 2 | Implemented | ▲ White | Network Rail | Recommendation(s) and Status Report: East Coast Main Line |
| Dangerous occurrence at Denmark Hill station | 23/2014 | 01/08/13 | 3 | Impl. ongoing | | | |
| | | | 1 | Impl. ongoing | | | |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Impl. ongoing | | | |
| | | | 4 | Impl. ongoing | | | |
| | | | 5 | Implemented | | | |
| | | | 1 | Impl. ongoing | | | |
| Class investigation into rail breaks on the East Coast Main Line | 24/2014 | 14/09/12 | 2 | Impl. ongoing | | | Recommendation(s) and Status Report: East Coast Main Line |
| | | | 3 | Impl. ongoing | | | |
| | | | 4 | Impl. ongoing | | | |
| | | | 5 | Implemented | | | |
| | | | 1 | Impl. ongoing | | | |
| | | | 2 | Implemented | ▲ White | Network Rail | Recommendation(s) and Status Report: Bridgeway user worked crossing, near Shrewsbury |
| | | | 3 | Implemented | ▲ Blue | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|---|-------------------------|------------|------------|--|-----------------------|---------------------------------|---|
| Buffer stop collision at Chester station | 26/2014 | 20/11/13 | 1 | Impl. ongoing | | Arriva Trains Cross Country Ltd | Recommendation(s) and Status Report: Chester station |
| | | | 2 | Implemented | | Virgin Trains | |
| | | | 3 | In-progress | | RSSB | |
| Derailment at Liverpool Street station, London | 27/2014 | 23/01/13 | 1 | In-progress | | Network Rail | Recommendation(s) and Status Report: Liverpool Street station, London |
| | | | 2 | In-progress | | | |
| | | | 3 | In-progress | | | |
| Collision between a train and a car at Jetty Avenue level crossing, Woodbridge, Suffolk | 28/2014 | 14/07/13 | 1 | In-progress | | Network Rail | Recommendation(s) and Status Report: Jetty Avenue level crossing, Woodbridge, Suffolk |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Impl. ongoing | | | |
| | | | 4 | Impl. ongoing | | | |
| | | | 5 | In-progress | | | |
| Unauthorised entry of a train onto a single line at Greenford | 29/2014 | 20/03/14 | 1 | Implemented | | Chiltern Railways | Recommendation(s) and Status Report: Greenford |
| | | | 2 | Implemented | | Network Rail | |
| | | | 3 | Implemented | | | |
| Fatal accident involving a track worker near Newark North Gate station | 01/2015 | 22/01/14 | 1 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Newark North Gate station |
| | | | 2 | ORR response awaited | | | |
| Derailment of freight train at Stoke Lane level crossing, near Nottingham | 02/2015 | 27/08/13 | 1 | Implemented | | Health and Safety Executive | Recommendation(s) and Status Report: Stoke Lane level crossing, near Nottingham |
| | | | 2 | ORR response awaited | | Network Rail | |
| | | | 3 | ORR response awaited | | | |
| | | | 4 | ORR response awaited | | | |
| Derailment of an empty passenger train at Paddington station | 03/2015 | 25/05/14 | 1 | ORR response awaited | | Siemens (trains & trams) | Recommendation(s) and Status Report: Paddington station |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | | |
| | | | 4 | ORR response awaited | | | |
| | | | 5 | ORR response awaited | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|-----------------------|--|--|
| Runaway and subsequent collision near to Loughborough Central station, Great Central Railway | 04/2015 | 12/05/14 | 1 | ORR response awaited | | Great Central Railway | Recommendation(s) and Status Report: Loughborough Central station, Great Central Railway |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | | |
| | | | 4 | ORR response awaited | | | |
| Fatal accident at Frampton level crossing | 05/2015 | 11/05/14 | 1 | ORR response awaited | | Network Rail ORR Department for Transport | Recommendation(s) and Status Report: Frampton level crossing |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | | |
| | | | 4 | ORR response awaited | | | |
| Accident to a track worker near Redhill | 06/2015 | 24/06/14 | 5 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Redhill |
| | | | 6 | ORR response awaited | | | |
| Train driver receiving a severe electric shock at Sutton Weaver, Cheshire | 07/2015 | 23/09/14 | 1 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Sutton Weaver, Cheshire |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | | |
| Near miss involving track workers near Hest Bank, Lancashire | 08/2015 | 22/09/14 | 1 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Hest Bank, Lancashire |
| | | | 2 | ORR response awaited | | | |
| Parting of the live overhead wire at Walkergate station, Tyne and Wear Metro | 09/2015 | 11/08/14 | 1 | Impl. ongoing | | Nexus DB Regio Tyne and Wear Ltd Nexus DB Regio Tyne and Wear Ltd | Recommendation(s) and Status Report: Walkergate station, Tyne and Wear Metro |
| | | | 2 | Impl. ongoing | | | |
| | | | 3 | Impl. ongoing | | | |
| Derailment at Porthkerry, South Wales | 10/2015 | 02/10/14 | 1 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Porthkerry, South Wales |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | | |

Appendices

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|---|-------------------------|------------|------------|--|-----------------------|----------------------|--|
| Freight train derailment at Angerstein Junction | 11/2015 | 02/04/14 | 1 | ORR response awaited | | Aggregate Industries | Recommendation(s) and Status Report: Angerstein Junction |
| | | | 2 | ORR response awaited | | RSSB | |
| | | | 3 | ORR response awaited | | Network Rail | |
| | | | 4 | ORR response awaited | | | |
| | | | 5 | ORR response awaited | | | |
| | | | 6 | ORR response awaited | | RSSB | |
| Train struck and damaged by equipment cabinet door in Watford Tunnel | 12/2015 | 26/10/14 | 1 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Watford Tunnel |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | Siemens (signalling) | |
| | | | 4 | ORR response awaited | | Network Rail | |
| | | | 5 | ORR response awaited | | Henry Williams Ltd | |
| | | | 6 | ORR response awaited | | Network Rail | |
| Runaway of 'iron men' trolleys and subsequent near miss at Raven level crossing, Garnant, Carmarthenshire | 13/2015 | 01/11/14 | 1 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Raven level crossing, Garnant, Carmarthenshire |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | Permaquip Ltd | |
| | | | 4 | ORR response awaited | | Network Rail | |
| | | | 5 | ORR response awaited | | RSSB | |
| | | | 6 | ORR response awaited | | Network Rail | |
| Class investigation into irregularities with protection arrangements during infrastructure engineering work | 14/2015 | 17/12/12 | 1 | ORR response awaited | | Torrent Trackside | Recommendation(s) and Status Report: Irregularities with protection arrangements during engineering work |
| | | | 2 | ORR response awaited | | Network Rail | |
| Collision between a train and a collapsed signal post at Newbury | 15/2015 | 17/11/14 | 1 | ORR response awaited | | Network Rail | Recommendation(s) and Status Report: Newbury |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | | |
| | | | 4 | ORR response awaited | | Amey | |
| | | | 5 | ORR response awaited | | Network Rail | |

| Investigation title | Report Number | Event date | Rec number | Status of recommendation at 31/12/2015 | RAIB concern (if any) | End Implementer | Recommendation(s), status and action taken at 31/12/2015 |
|--|-------------------------|------------|------------|--|--|--------------------|---|
| Freight train derailment at Heworth, Tyne and Wear | 16/2015 | 23/10/14 | 1 | ORR response awaited | Freightliner Group | Freightliner Group | Recommendation(s) and Status Report: Heworth, Tyne and Wear |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | Network Rail | | |
| | | | 4 | ORR response awaited | | | |
| | | | 5 | ORR response awaited | | | |
| Trains struck platform at Moston, Manchester | 17/2015 | 28/01/15 | 1 | ORR response awaited | All FOCs | All FOCs | Recommendation(s) and Status Report: Moston, Manchester |
| | | | 2 | ORR response awaited | Network Rail | | |
| Electrical arcing and fire under a train near Windsor & Eton Riverside | 18/2015 | 30/01/15 | 1 | ORR response awaited | Wabtec Rail Ltd | Wabtec Rail Ltd | Recommendation(s) and Status Report: Windsor & Eton Riverside |
| | | | 2 | ORR response awaited | South West Trains (Incorporates Island Line) | | |
| | | | 3 | ORR response awaited | | | |
| | | | 4 | ORR response awaited | Network Rail | | |
| Unsafe events at Heathrow Tunnel Junction, 27 and 28 December 2014 | 20/2015 | 28/12/14 | 1 | ORR response awaited | Network Rail | Network Rail | Recommendation(s) and Status Report: Heathrow Tunnel Junction |
| | | | 2 | ORR response awaited | | | |
| | | | 3 | ORR response awaited | | | |
| | | | 4 | ORR response awaited | | | |

Appendices

Appendix C - Glossary of abbreviations and acronyms

| | |
|---------|---|
| AHB | Automatic half barrier |
| BEA-TT | Bureau d'Enquêtes sur les Accidents de Transport Terrestre |
| COSS | Controller of site safety |
| CP | Control Period |
| DRDNI | Department for Regional Development Northern Ireland |
| ECM | Entity in Charge of Maintenance |
| ECO | Electrical Control Operator |
| ERA | European Railway Agency |
| ERA SIS | European Railway Agency Safety Information System |
| ITSA | International Transport Safety Association |
| LRT | Light Rapid Transit |
| NIB | National Investigation Body |
| ORR | Office of Rail and Road |
| PTI | Platform Train Interface |
| PDSW | Planning and Delivery of Safe Work |
| PICOP | Person in Charge of Possession |
| RIDDOR | Reporting of Injuries, Diseases and Dangerous Occurrences Regulations |
| ROSCO | Rolling Stock Leasing Companies |
| RSSB | Rail Safety and Standards Board |
| SIS | Safety Information System |
| SMS | Safety Management System |
| SPAD | Signal Passed At Danger |
| SWL | Safe Work Leader |
| TME | Track Maintenance Engineer |
| TOC | Train Operating Company |
| UIC | Union International Chemins de Fer |
| USA | Urgent Safety Advice |
| UWC | User Worked Crossing |

Appendix D - Glossary of terms

All definitions marked with an asterisk, thus (*), have been taken from Ellis's British Railway Engineering Encyclopaedia © Iain Ellis. www.iainellis.com.

| | |
|----------------------------|--|
| Bogie | A metal frame equipped with two or three wheelsets and able to rotate freely in plan, used in pairs under rail vehicles to improve ride quality and better distribute forces to the track.* |
| Cess | Space alongside the line, it can provide space for a Cess path but it is not always a position of safety.* |
| Cyclic top | Regular vertical, medium wavelength variations from design level.* |
| Footpath crossing | A level crossing provided solely for use by pedestrians.* |
| Infrastructure Manager | Any person who is responsible for establishing and maintaining infrastructure or a part thereof, which may also include the management of infrastructure control and safety systems, but does not include a maintainer.* |
| Iron Men | (Trade name) Pairs of small gantries fitted with chain hoists and rail wheels, used to transport rails, crossings and switch half sets to and from sites without using powered plant. * |
| Locally Monitored Crossing | A level crossing operated by a signaller or crossing keeper from a signal box or crossing box adjacent to the level crossing.* |
| Points | An assembly of Switches and Crossings designed to divert trains from one line to another.* |
| Road Rail Vehicle | Any vehicle adapted to operate equally well on road and rail. |
| Spigots | A peg, in some cases hinged or retractable, used to retain containers laterally on a wagon deck.* |
| Track Geometry | The horizontal and vertical Alignment of the track.* |
| Track twist | The variation in cross-level over a given distance. |
| User worked crossing | A level crossing where the barriers or gates are operated by the user. There is generally no indication of the approach of trains, but a telephone will be provided to contact the signaller.* |

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Any enquiries about this publication should be sent to:

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|-------------|---|
| RAIB | Telephone: 01332 253300 |
| The Wharf | Fax: 01332 253301 |
| Stores Road | Email: enquiries@raib.gov.uk |
| Derby UK | Website: www.gov.uk/raib |
| DE21 4BA | |