1. Purpose

This paper seeks to provide the board with an overview of current workforce health and safety risk, including performance trends and topical developments.

2. Key points concerning workforce risk

- Two members of the workforce were killed: the first in a road traffic accident on duty, the second after being struck by a moving train.
- There were no workforce fatalities in train derailments or collisions.
- There was a decrease in major and minor injuries during the year, with major injuries at its lowest level over the past ten years.
- Being struck / crushed by trains is the greatest fatal accident risk.
- Fatal accident risk from road vehicle incidents has increased recently, but the true scale is unknown.
- Single biggest cause of major injuries remains as slips, trips and falls.
- Risk management improvement initiatives are underway for leadership, culture, fatigue, health, road vehicle driving, competence and data.

3. Workforce Safety Risk and Performance

3.1 Safety risk - the Safety Risk Model (SRM) calculates the estimated level of underlying risk to passengers, public and workforce on the mainline operational railway. Last updated in 2012, the SRM calculated workforce risk as 26.9 Fatalities and Weighted Injuries (FWI) which is 19% of total system risk – see Appendix 1, Charts 1-2. In terms of fatalities the SRM estimates an underlying level of 3.9 fatalities per year.

3.2 Performance trends - a total of 22.6 FWI occurred on the mainline operational railway in 2012/13, compared to 24.5 the previous year. The headlines are:
- 2 worker fatalities occurred during the year – one in a road traffic collision while on duty, while another was struck by a passenger train and fatally injured.
- 114 major injuries, 4767 minor injuries and 932 cases of shock/trauma.
- Major causes of injury were slips, trips and falls and contact with objects.
- Infrastructure workers have the highest FWI and the trend has now increased for the first time in 5 years.
- The operating community have experienced a reduction in workforce assaults, but a further increase in train driver major injuries.
Further details about injury severity trends can be found in Appendix 1, Charts 3-4. A comprehensive analysis of workforce fatalities, major and minor injuries on the mainline operational railway by type of workers is found in the 2012/13 Annual Safety Performance Report (ASPR) available on RSSB’s website.

3.3 The European Safety Directive states that the overarching safety requirement for European railways is to maintain safety and improve where reasonably practicable. The trajectories of the Strategic Safety Plan (SSP) are in keeping with this aim, and meeting them will additionally ensure that the passenger and workforce safety targets laid out by the DfT in the HLOS are met. After 4 years of CP4, safety performance satisfies all but one of the SSP trajectories and HLOS targets (this being catastrophic failure of rolling stock and not workforce related). Performance also satisfies the National Reference Value targets set by the European Railway Agency comparing well against the rest of Europe.

3.4 Yards, depots and sidings (YD&S) - workers are also exposed to risk away from the mainline operational railway including in rail yards, depots and sidings. Historically these have been outside the scope of SMIS and the SRM, although a project is underway to incorporate these risks by end of CP4. To date worker risk in YD&S has been calculated at 7.18 FWI pa. However reporting of data is voluntary and so some data is likely to be missing. Therefore an estimate of total risk has been modelled as 9.2 FWI pa\(^1\). Train maintenance staff make up the greatest proportion of absolute risk across the workforce types, followed by drivers / shunters and infrastructure workers. The main types of accidents occurring in YD&S are the same as on the mainline railway i.e. slips, trips and falls and contact with objects, but with less risk from being struck by trains due to lower line speeds. Conversely, manual handling/awkward movement and machinery/tool operation cause relatively more accidents in YD&S. Further details are shown in Appendix 2, Chart 5.

3.5 An initial comparison of mainline and London Underground (LU) workforce safety is contained in Appendix 3, and the ORR note in their 2012 strategy:

‘LU has good recent history with regard to worker safety; there have been no workforce fatalities since 1997-8. The number of RIDDOR reportable major injuries are now at such a low level that analysis of trends is not helpful. Similarly the long-term downward trend in lost time injuries continues from an average of 52 every 4 weeks in 2006-07 to an average of 29 every 4 weeks in 2010-11.’

4. Commentary on national data availability and quality

4.1 The data set for workforce safety across the industry is incomplete for historic reasons. Information about incidents on mainline operational railway is largely reported via SMIS, but is different for incidents occurring elsewhere as follows:

- Yards, depots and sidings – voluntary reporting has commenced and a project is underway to improve the level of data and more detailed analysis
- Non rail served premises – not nationally reported.
- Public highway and private roads – very low level of incident reporting.
- London Underground / Light Rail – separate client reporting arrangements

As a consequence, understanding of workforce safety risk remains incomplete.

\(^1\) Currently, the data collected for YD&S comes mostly from the passenger train operator community; little data has been reported by freight operators. Initiatives are under way with the National Freight Safety Group (NFSG) to encourage freight reporting and to enable the estimation of total YD&S risk.
4.2 Sponsored by the Infrastructure Safety Liaison Group (ISLG), infrastructure contractors are working with RSSB to establish comprehensive workforce incident reporting arrangements for all activities, with the objective of creating a contractor based workforce safety risk model. Dialogue is also underway with Network Rail and London Underground to help make this happen.

4.3 The National Freight Safety Group (NFSG) also recognise reporting issues with worker safety, and have agreed to develop new reporting arrangements with a similar objective of creating a freight safety risk model.

4.4 Following changes to RIDDOR reporting in April 2012, the Health and Safety Executive have undertaken a further review of the regulations and aim to publish new guidance in Oct 2013. The ORR are to publish rail specific guidance in support of the revised regulations.

5. **Learning from experience**

5.1 Common issues – a review has been undertaken of ORR’s annual report plus 2012/13 enforcement action, RAIB investigation reports and CIRAS reports with a number of reoccurring themes emerging. These are summarised in Appendix 4, and further information about industry wide learning is presented in the Learning from Operational Experience Annual Report 2012/13.

5.2 Europe – there is no reliable source of workforce safety incident information across European railways; however intelligence from various recent UIC forums has identified three key areas of workforce risk between July 2012 - June 2013:

- **Collisions** - there were four incidents, two of which involved plant which was too close to an open running line. A track worker in Germany was killed by flying debris when a wagon was struck by an express travelling at full speed, and two track workers were killed in Austria when their maintenance wagon was struck by a train.
- **Electrocution** - there were two incidents leading to three deaths that highlighted the risk from working on or near power lines.
- **Tools and machinery** - Network Rail’s daily control logs regularly feature incidents involving tools and machinery. This trend is not confined to the UK, with several examples in Europe leading to serious injuries to the workforce.

5.3 The Close Call Reporting system (CCS) has been subject to recent extensive development, with phase 2 introduced in Oct 2012. NR has since mandated all Principal Contractors (PC’s) to ‘register’ with the CCS, resulting in a fourfold reporting increase. It is still a limited data set, but provides some points of note:

- ‘Site Welfare & Housekeeping’ dominates every month – often >33%.
- The vast majority of risks are categorised as ‘medium’ or ‘low’ risk.
- All PC’s are required to register on the CCS but not all are currently reporting.
- Differing reporting profiles between projects, and the phasing of projects.

5.4 Fatigue – work to better understand and manage risk from fatigue continues. A RSSB R&D project has recently led to guidance for managing driving fatigue ([http://www.rssb.co.uk/RESEARCH/Lists/DispForm_Custom.aspx?ID=1107](http://www.rssb.co.uk/RESEARCH/Lists/DispForm_Custom.aspx?ID=1107)). In addition, a RED DVD (35) highlighted the issues and consequences of fatigue using a filmed dramatisation of a road accident involving a typical track worker.
The filmed element has since been uploaded to Network Rail’s Safety Central website. The CIRAS Newsletter has also been used to share good practice.

6. **Developments**

6.1 The ORR published their ‘Strategy for Regulation of Health and Safety Risks’ in Sept 2012 with their key priorities for workforce safety corresponding to industry performance (e.g. incidents of track workers being struck by moving train/plant):

- Worker struck by train (including shunting activities)
- Worker struck/crushed by other moving plant
- Falls from height
- Electrical safety

6.2 Network Rail has published a new Vision and Strategy ‘Transforming Safety & Wellbeing 2012-2024’ to deliver business improvement through more mature safety management. The following workforce oriented work streams are noted:

- fatigue - eliminate people working as routine in excess of 60 hours in a week
- track work – develop an access strategy involving higher integrity systems of work than are captured in the current Red/Green Zone distinctions
- aim to prohibit red zone working by unassisted lookout in certain cases (e.g. at night) once primary track inspection does not depend on foot patrols
- halve the number of major injuries from slips, trips and falls on or about the track
- improved management of occupational health risks and educational campaigns
- implement major reform on managing business driving risks for the workforce
- major investments for the protection of trackside workers, such as around taking isolations of existing electrified lines and RRV safety modifications

6.3 Over the past year, RSSB has initiated with our members a number of important projects to help improve management of road driving risk, worker health, fatigue, the Rule Book and working at height. A summary of these and other relevant developments can be found in Appendix 5.

6.4 Working on or near the infrastructure - as noted in recent RAIB investigations (Appendix 4) there has been a trend of management failings with regards to safety of track workers, operation of RRVs and possession concerns. Reports of unsafe possession arrangements are common, ranging from incorrect and unprotected locations to premature removal of protection. Competence and allocation of roles have also been raised as issues for track worker safety.

7. **Recommendations**

The board is invited to:

- **CONSIDER** and **DISCUSS** the key points identified in this paper.
- **CONFIRM** that they are content that they have reviewed and considered the significant items of workforce safety risk that impact on the industry and are satisfied with the overall arrangements to control the risk.
Appendix 1

Workforce Risk Performance Charts 2012/13

Chart 1. FWI risk profile from SRMv7.5, excluding suicide (139.2 FWI/year)

- Risk to members of the public: 57.7 FWI (41%)
- Risk to passengers: 54.7 FWI (39%)
- Risk to the workforce: 26.9 FWI (19%)

Risk to the workforce breakdown:
- Infrastructure workers: 12.1 FWI (45%)
- Train drivers: 3.8 FWI (14%)
- Other on-board train crew: 5.9 FWI (22%)
- Revenue protection staff: 1.1 FWI (4%)
- Station staff: 2.4 FWI (9%)
- Other workforce: 1.6 FWI (6%)

Chart 2. Workforce risk by accident type: 26.9 FWI per year

- Slips, trips, and falls: 6.3 FWI per year
- Contact with object or person: 4.2 FWI per year
- On-board injuries: 3.1 FWI per year
- Assault and abuse: 2.2 FWI per year
- Struck / crushed by train: 2.2 FWI per year
- Platform-train interface: 1.7 FWI per year
- Manual handling / awkward: 1.3 FWI per year
- Train accidents: 1.2 FWI per year
- Witnessing traumatic events: 1.2 FWI per year
- Other type of workforce injury: 1.0 FWI per year
- Road-traffic accidents: 0.8 FWI per year
- Machinery / tool operation: 0.7 FWI per year
- Fall from height: 0.6 FWI per year
- Electric shock: 0.5 FWI per year

Source: SRMv7.5
Appendix 2

Workforce injuries in yards, depots and sidings

Chart 5. Total risk to each worker type from each accident category

- Major Injuries (55.0%)
- Minor Injuries (59.8%)
- Shock / Trauma (0.1%)
- Fatalities (7.1%)
- Class 1 Minor Injuries (12.6%)
- Class 2 Minor Injuries (14.9%)
- Class 1 Minor Injuries (13.9%)
- Class 2 Minor Injuries (14.2%)

Total Risk = 7.47 FWI/year
Total WF Risk = 7.18 FWI/year
Appendix 3

A comparison of workforce fatalities and weighted injuries – Mainline and LUL\(^2\)

Chart 6. Mainline workforce fatalities and weighted injuries by type of worker

Chart 7. LUL workforce fatalities and weighted injuries by type of worker

\(^2\) Please note the differing scaling of charts 6 and 7 which have been used for purposes of clarity.
Appendix 4

2012/13 Recurrent themes from ORR inspection/enforcement action, CIRAS reports and RAIB investigations in relation to workforce safety

<table>
<thead>
<tr>
<th>Recurrent themes</th>
<th>ORR enforcement actions</th>
<th>CIRAS reports</th>
<th>RAIB investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Fatigue management</td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>2 Inadequate competence of personnel or having in place an ineffective</td>
<td></td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>management system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Incomplete and badly maintained Safety Management System</td>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4 Ineffective safe system of working</td>
<td></td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>5 Working in an environment with hazardous substances</td>
<td></td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>6 Failure to efficiently conduct, or implement the findings of, risk assessments</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7 Faulty and or unsafe use of equipment</td>
<td></td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>8 Unsafe walking routes</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>9 Incidents or injuries not being reported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Personal security issues at mainline stations</td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

Enforcement – ORR actions associated with the management of workforce risk:

- Improvement Notices (13) – predominately regarding track working and associated arrangement for safe systems of work; Network Rail 6, Contractors 6, TOC 1
- Prohibition Notices (4) – all on contractors; 3 for RRVs, and 1 for working at height
- Prosecutions (6) – one of which directly related to a track worker fatality

Investigations - five key areas of workforce risk were highlighted by RAIB reports:

- Safety critical communications - not following SCC protocols have led to near misses involving trains and track workers.
- Training - examples of inexperienced staff, managing untrained workers, leading to unsafe conditions. These are compounded by the workers not recognising the seriousness of their position.
- Safety culture - A lack of challenge to unsafe situations through putting project delivery ahead of safety.
- Possession arrangements - reports of unsafe possession arrangements are common, ranging from incorrect / unprotected locations to premature removal of protection.
- Employee lifestyle - unsafe track working has been exacerbated by staff being unduly affected by external lifestyle issues such as home life, stress, etc.

3 RAIB’s most recent annual report identifies 2 recurrent themes relevant to workforce safety: 1) safety leadership and supervision during track maintenance and renewals and 2) fatigue.
4 These relate to events that occurred in previous years but came to court in 2012 – 2013.
### Appendix 5

**A detailed summary of recent industry developments in the field of workforce risk**

<table>
<thead>
<tr>
<th>Risk to members of the workforce</th>
<th>Key risk areas (risk from):</th>
<th>Main groups affected (risk to):</th>
<th>Main types of event relevant to workforce risk</th>
<th>RSSB actions to support industry</th>
<th>Industry co-operative actions</th>
<th>Duty holder actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk from workforce behaviour</td>
<td>Previous actions</td>
<td></td>
<td></td>
<td>Fatals, FWI</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>At stations</td>
<td>Train drivers, station staff</td>
<td>Attending to or witnessing passenger accidents.</td>
<td>0.00, 0.04</td>
<td>Station Safety Improvement project, Specific research and topic reports.</td>
<td>Red 28 focussed on the platform-train interface using a fictional dramatisation. A Rail Industry Standard (RIS) for passenger train dispatch and platform safety (RIS-3703-TOM) completed in June 2011.</td>
</tr>
<tr>
<td></td>
<td>On trains</td>
<td></td>
<td></td>
<td>0.00, 0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Station staff</td>
<td>Station staff</td>
<td>Personal injuries, Accidents related to train despatch and station management.</td>
<td>0.13, 1.95</td>
<td>RSSB facilitation of OFG and SSRG, Station Safety Improvement project, Specific research</td>
<td>Aerodynamics Project, Enhancement of train dispatch RIS</td>
</tr>
</tbody>
</table>
|                                  | Train crew                  | Train crew                      | Personal injuries, SPADs, Accidents related to train dispatch | 0.58, 5.61                     | Facilitation of OFG / SSRG, TPWS strategy support, Personal track safety of train crew, New approach to rules project, RED, Right Track and OPSWEB, Specific research e.g. T940 - Identifying, quantifying & managing the risk of musculoskeletal injuries & illness among train drivers | National Operators Risk Conference and workshops, New approach to route learning, TPWS risk management, Good practice share, ATOC Safety Forum | • NR level crossing strategy  
• Station safety improvement project  
• Individual company injury prevention  
• Fatigue management |
|                                  | Signaller                   | Signaller / crossing keepers    | Personal injuries, Miscommunication; and the operation of level crossings | 0.04, 0.19                     | RSSB facilitation of CSSG and RPSG, SWeRVe II | BTP Annual Plan Objectives | NR internal communication and line management |
|                                  | Infrastructure workers      | Infrastructure workers, including OTP crew | Occupational hazards including electrocution and being struck by trains. Train accidents caused by maintenance errors. Road vehicle safety, working with plant and at height. | 2.74, 13.41 | Facilitation of ISLG and OFG, Workforce health project, New approach to rules project, CIRAS, Road driving risk project, Specific research e.g. T997 - Managing occupational road risk associated with road vehicle driver fatigue | Network Rail PSLG, M & EE Group, Modernisation of Safety co-operation, New Close Call System, RED 35 – driving fatigue, Common Inductions, National Skills Academy, Ballast Dust Working Group | • NR Vision and Strategy for Transforming Safety and Well Being 2012-2024  
• NR Life Saving Rules  
• NR RRV Improvement programmes  
• NR track safety strategy  
• Contractor culture and leadership programmes  
• Fatigue control improvements |
<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>Description</th>
<th>Reported incidents</th>
<th>Prevented incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shunters</td>
<td>Shunters</td>
<td>Personal injuries (including crushed by trains), Coupling / train preparation errors.</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Weather</td>
<td>Train crew, track workers</td>
<td>Train accidents due to effects of high winds, flooding, snow &amp; ice etc.</td>
<td>0.01</td>
<td>0.04</td>
</tr>
<tr>
<td>Adjacent property/land</td>
<td>Infrastructure workers, train crew</td>
<td>Problems with the track, signalling systems, or bridges, embankments, tunnels etc.</td>
<td>0.19</td>
<td>1.05</td>
</tr>
<tr>
<td>Engineering failures</td>
<td>Trains</td>
<td>Faults with train interior (including seats and windows). Electrical faults. Brakes, bogies etc.</td>
<td>0.06</td>
<td>0.70</td>
</tr>
<tr>
<td>Crime</td>
<td>Station staff, train crew, crossing keepers</td>
<td>Assaults. Arson, missiles thrown at trains, objects on the line and other acts of vandalism. Witnessing suicides and accidents to / near misses with trespassers.</td>
<td>0.07</td>
<td>3.52</td>
</tr>
<tr>
<td>Public behaviour</td>
<td>Crossing keepers, train crew, infrastructure workers</td>
<td>Accidents at level crossings. Road vehicle incursions. Bridge bashes.</td>
<td>0.07</td>
<td>0.17</td>
</tr>
<tr>
<td>General</td>
<td>Train drivers, station staff</td>
<td>Attending to or witnessing accidents similar to passenger accidents in stations</td>
<td>0.00</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Total: 3.93  26.9

- RSSB facilitation of OFG
- Shunter Interactive training DVD
- TSLG and technical strategy
- NR Asset Management plan
- Improved drainage management
- Operational client controls
- Strategic replacement of softwood sleepers. Application of latest technology to monitor and reduce track defects. Focused risk assessment on track stressing & effects of weather on embankments and structures. Identification and remedy of 'rough-side' sites. Bridge examination intervals based on risk.
- ATOC Engineering Council
- ROSCO collaboration
- Introduction of a digital reader to measure axle box temperatures and new rolling stock with improved interior design. Fit high intensity headlights to class 142 and 143 fleet to enable increased visibility to track workers and people working on or near the line. Improve cab environment of class 66 locomotives to minimise fatigue levels. Fitment of a second interlock switch to class 150 to reduced the risk of 'wrong-side' door interlock failure.
- Track off
- NR trespass campaigns
- National Suicide Prevention Group
- BTP Annual Plan
- General improvements made to CCTV systems across a number of stations. Rail enforcement officers given direct access to the BTP radio network. Improved conflict training for members of staff. Fencing priorities matched with trespass hotspots. Campaign run during school holidays to deter trespass and anti-social behaviour. Closure of access to unused platforms. Placing of Samaritans posters around stations and additional staff training to identify potentially suicidal people. Utilise SWerVe v2.0 to educate staff on conflict avoidance and management.
- DIT and ORR follow up to risk assessment
- Participation in ILCAD
- BTP Annual Police Plan Objectives
- Continued development of NR's 'Don't Run the Risk' campaign with a new strapline ‘lifesavers not time wasters’. NR risk assessment of crossings through the Level Crossing Risk Model. Cameras installed at all level crossings and deployment of enforcement vehicles. Strategy to upgrade ACCLs and close UWCs when possible.
- Individual company programmes
- Station enhancement programmes