1. Purpose

1.1 This is the final paper in the Strategic Board Agenda for 2014. It shows how the board has considered the modelled safety risk for the industry. It considers the process relating to the review of the safety risk; summarises the responses of the board and discusses the strategic agenda from April 2014.

2. Key points

2.1 From the review of the safety risk profile for the railway by the board over 2013/14 the following key points have been identified:

- The HLOS safety targets, requiring a 3% reduction in the risk to passengers and the workforce over CP4, are likely to be met
- The risk trajectories for CP4 that were defined in the Strategic Safety Plan are likely to be met
- The review of international train accidents gave confidence that industry has the necessary control measures in place to manage such risk but highlighted that there is no room for complacency in tackling safety risk
- However, the risk associated with train accidents based on the estimates from the Precursor Indicator Model suggests that at present there is an increasing trend mainly due to a rise in the number of operating incidents with higher potential consequences
- While the platform-train interface, workforce road driving and workforce health and wellbeing have been specifically identified as areas for improvement, the board has recognised that wider industry cooperation in the management of risk is necessary to reduce risk during CP5
- In light of the above the board has established the System Safety Risk Group, its sub-groups and other associated groups to enable ongoing review of 100% of system risk.

2.2 It is noted that for CP5 Network Rail, in its Strategic Business Plan, has identified the key outcomes for the end of CP5 as being:

- Eliminating all fatalities and major injuries
- A 50% reduction in train accident risk
- An 8% reduction in risk at level crossings (which has now been updated to the maximum risk reduction achievable given the additional funds made available in the final determination)
3. **Background**

3.1 During the course of the year the board has considered a number of strategic papers and presentations on the main elements of system risk (see annex A). Each meeting considered a system safety item (together comprising coverage of the risk to passengers, the workforce and members of the public), stewardship reports from cross-industry groups that RSSB facilitates and other areas of risk such as the platform train interface and learning from train accidents. This paper provides a summary of the risk reviewed by the board over 2013/14.

4. **Progress on risk during 2013/14.**

4.1 The latest overview of safety performance, which covers the calendar year 2013, was published in January 2014 and is reproduced as Annex C to this paper.

4.2 For the purposes of monitoring progress on risk reduction over CP4 the HLOS Safety Metrics, which required a 3% reduction in both passenger and workforce risk over CP4, were established at the start of CP4. The outputs from the SRM is used as the basis for assessing the change in risk. Based on the estimates from v8 of SRM (currently being developed\(^1\)) the risk reduction at the end of CP4 for the workforce is likely to be well below the target level (greater than 10% reduction) and the risk reduction for the passengers is likely to be around the target level of 3%.

4.3 Also for CP4 15 Strategic Safety Plan Trajectories were established for risk monitoring. At the end of September 2013 performance in 14 of the 15 trajectories set out in the 2009-2014 SSP currently satisfies the trajectory, with varying levels of stability. For the trajectory related to rolling stock failure, performance at that time was marginally outside the trajectory. The contribution to the total system risk from this source is less than 1%.

4.4 Train accident risk - At the end of January 2014, the overall Precursor Indicator Model (PIM) measure stood at 8.22\(^2\), 7.2% higher than January 2013 at 7.67, and 5.7% lower than the January 2009 estimate of 8.72. For the risk to passengers only from train accidents at the end of January 2014, the PIM measure stood at 3.70, 19% higher than January 2013 at 3.11, and 4.2% higher than the January 2009 estimate of 3.55. Charts for the overall PIM measure and the passenger only case are presented in Annex B. The recent increase in the measure is due mainly to a rise in the number of higher risk operating incidents. Operating Incidents are acts or omissions by railway staff which result in an actual or potential safety loss.

5. **System safety risk 2013/14**

5.1 Figure 1 summarises the system safety risk areas covered by the Strategic Board Agenda papers. As defined by RSSB’s Safety Risk Model Version 7.5 (SRM v7.5), the board considered the modelled residual risk on the mainline railway through the three papers on passenger, workforce, and public risk. Each of the risk papers focussed on particular areas of risk within the category under discussion represented by the darker shades in Figure 1. Risk areas represented by lighter shades for the three person types were covered in appendices, which showed all of the risk from the SRM, including summaries of how industry including RSSB address all risk areas. Each of

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\(^1\) Due for release in early April 2014  
\(^2\) Note: the way results for the PIM are presented has recently changed from a relative measure compared to a baseline of 100 to an estimate of the Fatalities and Weighted Injuries (FWI) per year from the Potentially High Risk Train Accidents
the individual risk papers included a table showing the RSSB projects, industry cooperative actions and duty holder actions are undertaken to understand and manage the risk in each risk area. For completeness these tables are presented in Annex D. Together these show how the industry is managing the safety risk defined by the SRM.

5.2 In general the attention paid to each area of risk has been considered appropriate, and the board noted that the arrangements in place for duty holders, or collectively through RSSB or cross industry groups, are adequate to address the relevant risks. Where system issues were remitted to RSSB or relevant cross industry groups, the actions identified have been noted in minutes and subsequent board papers.

6. Strategic risk review

6.1 During the discussion on the Annual Risk Review paper in March 2012 the board agreed that they should take time out from their normal agenda to look forward strategically at the system risk profile and identify if there are any factors/issues, from their perspective, that could affect the risk profile in the coming years and consider if adequate understanding and/or mitigations are in place to manage the identified factors. Nine key strategic risk areas were identified, namely;

1. The settlement for control period 5, and the implications that this will have for the railway,
2. Changes to the labour force,
3. Capacity to grow,
4. Changing societal expectations,
5. Ageing infrastructure and the modern environment,
6. Workforce risk in a 24/7 railway,
7. Increased use of IT and software based systems,
8. Electrification, and
9. European legislation and TSIs.

6.2 The results were presented and discussed at the September 2013 board meeting. It was felt that the strategic risk review had been a valuable exercise identifying some key industry risk issues and how the industry intends to tackle them going forward. The outputs are being fed into the ongoing System Safety Risk Group (SSRG) horizon scanning activities and will be discussed more widely at the RDG sponsored Industry Safety Meeting in April 2014.

7. Key safety risk management initiatives considered in 2013/14

7.1 Platform Train Interface – Following the accident at James Street in October 2011 and other PTI related incidents there was considerable interest in improving the management of the PTI with discussions being held at an Industry Safety Meeting in February 2013 and the ORR/RSSB industry workshop in April 2013. In September 2013 the board agreed to establish a PTI Strategy Group to take both a short term and longer term approach to improving the PTI including safety, operational performance, right of access for train operation including freight services, accessibility, public behaviour/perception, consistent industry approaches, reducing cost, etc. The group is now established and work packages are developing.

7.2 Road driving risk – There were two workforce fatalities in a road accident in 2013. RSSB has initiated a cross industry project to understand the true scale and extent of this risk involving the ORR and HSE. A strategy has been developed to address the major systematic underreporting of Road Traffic Collisions (RTC)s and personal
injuries that exists across the industry, in addition to the lack of awareness and understanding by rail companies of the consequential impact and costs that RTCs have on their business and workforce.

7.3 Signals Passed at Danger – The issues relating to SPADs were considered in a paper in May 2013 resulting in a request for an update in March 2014 (Agenda Item 2).

7.4 Modernisation of safety cooperation – This initiative has developed further during 2013/14 with SSRG and its sub-groups being established and the old groups they replace being ended with a clear disposition of their activities to the new groups or discontinued where appropriate. Further consolidation of these arrangements will continue during 2014/15.

7.5 Learning from accidents – Following the four serious train accidents outside the UK in July 2013, the board examined the range of notable train accidents and incidents from the last few years to consider if there are any gaps and highlight the need to maintain focus on train accident risk in the future. From the information gathered it was concluded that there is evidence that there are controls in place on the GB mainline railway to protect/mitigate against this range of train accidents with no major gaps being identified, but noted that there is no room for complacency in tackling these areas of risk.

7.6 Data quality – the quality of the safety related event data reported into SMIS by the industry was maintained during 2013 based on the RSSB data quality healthchecks.

8. Strategic board agenda for 2014/15

8.1 After several years of following a consistent format, the strategic board agenda will be different for 2014/15. It was agreed at the November 2013 board meeting that SSRG should take responsibility for the workforce, public and passenger risk papers which would then be considered annually at the board through a consolidated report on how all risks are understood and mitigated. This report, once considered and approved by the board would then be published in the Annual Safety Performance Report (ASPR) to demonstrate to all interested parties that due consideration had been given to the subject. Any significant risk issues identified by SSRG during the year would be brought to the boards attention where appropriate. The space made available in the board agenda as a result of these changes will enable selected topics to be discussed in more detail as they arise. Suggestions from board members would be appreciated.

9. Completeness of review

9.1 The executive and members of RSSB staff have reviewed the risks covered in both safety and strategic non safety areas and consider that overall the company has considered and reported on the most significant risk and opportunity areas where RSSB can support the industry. As part of the overall governance of the risk issues for the industry, this paper will be sent to the ORR and will be summarised in the 2013/14 ASPR.

10. Recommendations

10.1 The board is asked to;

- CONFIRM that they are content that during the year they have reviewed and considered the significant items of system safety risk that impact on the industry and are satisfied with the overall arrangements.
Annex A

How system risk was considered by the board
Annex B

Outputs from the Precursor Indicator Model (PIM)

PIM - Overall risk profile for train accidents

PIM – Passenger risk profile for train accidents
Annex C

Overview of safety performance for 2013

Introduction
On behalf of the industry, RSSB takes a key role in the monitoring and reporting of safety performance on Great Britain’s mainline railway. In advance of our detailed reporting in the Annual Safety Performance Report (ASPR) for the financial year 2013/14, we are presenting a high-level overview of safety performance for the calendar year 2013. The recorded performance should be viewed against an overall context of increasing passenger usage, with levels having increased by around 25% over the last five years.

Key headlines
- For the sixth year in succession, there were no passenger or workforce fatalities in train accidents.
- Excluding trespass and suicide, the total number of fatalities in 2013 was 19, compared with 11 in 2012.
- Six of the fatalities were passengers at stations, compared with none in 2012. 2012 was exceptional in that it was the first calendar year where no passenger fatalities were recorded; 2013 was more consistent with the longer-term average. Two members of the workforce were fatally injured: the same number as in 2012. Excluding trespass and suicide, 11 members of the public were fatally injured, compared with nine in 2012.
- The number of potentially higher-risk train accidents (PHRTAs) in 2013 was 29, compared with 36 occurring in 2012.
- At 297, the number of category A signals passed at danger (SPADs) in 2013 was a 19% increase on the 250 recorded in 2012. In contrast, SPAD risk remained relatively stable, ending 2013 at 69% of the September 2006 baseline level, compared with 66% at the end of 2012.
- Fatalities arising from trespass and suicide totalled 304 in 2013, compared with 297 in 2012.

Trends in train accidents
The 10-year average for the number of train accidents resulting in passenger or workforce fatalities remains lower than one every two years. The last such accident was the train derailment at Grayrigg in 2007, in which one passenger lost her life.

More detailed safety analyses are presented in RSSB’s Annual Safety Performance Report (ASPR); the next ASPR will cover the 12-month period April 2013 to March 2014, and is due for publication at the end of June 2014. Information contained in this summary should be treated as provisional.
Overview of safety performance for 2013

Potentially higher-risk train accidents (PHRTAs)

PHRTAs are those train accidents that have the greatest chance of resulting in physical injury. They comprise statutorily reportable train collisions (excluding roll back and open door collisions), buffer stop collisions, trains striking road vehicles (with derailment and without derailment), other derailments, and trains being struck by large falling objects. Three PHRTAs resulted in four fatalities to members of the public; each involved a road vehicle being struck at a level crossing. In one of the events, two occupants of the same road vehicle were killed. Eight PHRTAs resulted in injuries to members of the workforce or passengers; one of the injuries was a major injury, and occurred to a passenger during a low-speed collision between trains at a station platform.

Precursor indicator model (PIM)

RSSB’s PIM measures the underlying risk from train accidents by tracking changes in the occurrence of accident precursors and their potential consequences. In 2013, the PIM methodology was improved to enable it to be ‘equated’ to the level of fatalities and weighted injuries (FWI) that the underlying train accident risk represents. The PIM indicates that at the end of 2013, the underlying passenger risk from train accidents was 3.6 FWI, compared with 3.1 FWI at the end of 2012. The increase is due mainly to a rise in the number of operating incidents. Operating Incidents are acts or omissions by railway staff which result in an actual or potential safety loss.
Overview of safety performance for 2013

Signals passed at danger (SPADs)

At 297, the number of SPADs in 2013 was 19% higher than the 250 occurring in 2012. At the end of 2013, SPAD risk stood at 69% of the September 2006 baseline level, compared with 66% at the end of 2012.

![Graph showing signals passed at danger (SPADs)]

Fatalities

The following chart presents the number of accidental fatalities occurring over the past 10 years to passengers, the workforce and members of the public not involved in trespass. There were six passenger fatalities; the average for the decade as a whole is 6.9 per year. In 2012, there were no passenger fatalities; the first time this has occurred in a calendar year since recording began.

![Graph showing fatalities over the past 10 years]
**Overview of safety performance for 2013**

**Summary of fatality events**

There were 19 fatalities recorded in 2013, excluding those related to trespass or suicide. Six were passengers, two were members of the workforce, and eleven were members of the public.

**Passengers**
- On 15 February, a man lying at the platform edge was fatally struck by a train entering the station.
- On 20 March, a man received a fatal head injury after falling down stairs in a station.
- On 30 March, a man fell between the train and platform, following an altercation with other people in the station.
- On 4 April, a woman fell from the platform edge, as a train was entering the station, suffering a heart attack as a result of the event.
- On 6 November, a man fell from the platform edge on to the track. He was taken to hospital, where he died from his injuries.
- On 21 December, a man fell from the platform edge, and was struck by a train.

**Workforce**
- On 19 June, two infrastructure workers travelling in the same vehicle were fatally injured in a road traffic accident while returning from a worksite to their depot.

**Members of the public**
- Four people died when their motor vehicles were struck by trains at level crossings. Two of the fatalities occurred in the same accident and were occupants of the one vehicle.
- Six pedestrian users of level crossings died as a result of being struck by trains.
- A child died after being struck by a train during an incident where his mother deliberately accessed the track to commit suicide.

**Trespass and suicide**

The number of fatalities from trespass, suicide and suspected suicide in 2013 was 304, an increase of seven compared with the 297 that were recorded in 2012.

**Further information**

More detailed safety analyses are presented in RSSB’s ASPRs. The 2013/14 APR will cover the 12-month period April 2013 to March 2014 and is due for publication at the end of June 2014. RSSB reports detailed safety performance on a financial year basis, for consistency with Control Period 4, its associated High Level Output Specification and the Railway Strategic Safety Plan for 2009-14.

RSSB is happy to take questions or comments on the information in this overview. Please contact Liz Davies, Safety Intelligence Strategy Manager, with any queries or feedback: liz.davies@rssb.co.uk, tel. 020 3142 5475.