



Overview of the Risk Profile Bulletin, version 5.5

Introduction

To manage safety effectively, it is vital that RSSB members are able to assess and understand the safety risk associated with our railway. The Safety Risk Model (SRM) is a key source of information for the rail industry in this area. It is a structured representation of the 125 hazardous events that could lead directly to injury, or fatality, during the operation and maintenance of the GB mainline railway. The SRM considers the system as a whole, rather than the details for a particular route or operator.

The SRM is, where possible, populated using relevant historical accident data. Where little data exists, particularly for the low-frequency but potentially high-consequence accidents, the model makes use of predictive fault and event tree modelling, structured expert judgement from technical specialists and statistical methods. In this way the SRM provides an estimation of the underlying levels of risk on the railway that is not obtainable from historical data alone.

Following the development and definition of the safety metrics for passengers and the workforce within the High Level Output Specification¹, it was agreed that the SRM will be used to provide the baseline risk estimates for the safety metrics prior to the start of Control Period 4 in April 2009. To facilitate this, it is planned that the SRM will be updated to version 6 by March 2009 at which point the baseline safety metrics will be established.

It was recognised that the risk information would become progressively out of date between publication of version 5 (August 2006) and version 6 (March 2009). The industry based SRM Practitioners Working Group (SRMPWG) supported by the Safety Policy Group (SPG), requested the issue of an interim update (version 5.5) to enable company safety plans to be aligned with the latest risk information.

Version 5.5 of the RPB is based on Version 5.5 of the SRM. It represents a partial update of the risk profile where it is likely to have changed significantly since version 5. For all other parts of the model the risk estimates from version 5 have been carried forward. Risk figures are presented according to the new weightings of fatalities and weighted injuries (FWI) that came into effect from 1 April 2008. The new weightings formalise the basis on which shock/trauma is taken into account, and gives less weight to less severe minor injuries. This allows safety expenditure to be directed towards those incidents and accidents that lead to the highest levels of risk without ignoring the types of incident that typically have less severe outcomes.

Overall risk profile

There has been a 1.7% reduction in the overall risk, from 139.9 FWI/yr to 137.4 FWI/yr. Chart 1 shows the total risk, broken down by accident category, presented in fatalities and weighted injuries per year (FWI/yr). Train accidents have decreased by 1.1%, while movement accidents have decreased by 4.6% and trespass accidents have decreased by 4.9%.

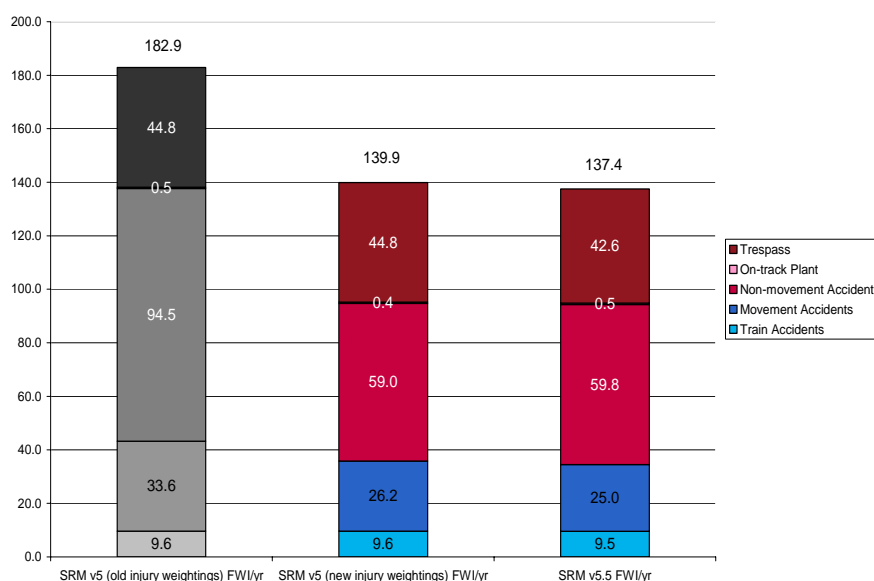


Chart 1: Total risk by accident category (excluding suicides, and passenger and member of the public assault)



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It should be noted that version 5 did not include shock/trauma and minor injuries to the workforce as a result of suicide, which is now included in the version 5 figures in Chart 1. Chart 1 also shows that the new injury weightings have reduced the total risk for version 5 from 182.9 FWI/yr to 139.9 FWI/yr, a 23.5% reduction. Staff is the group most affected by the change, with a 44% reduction in risk. Passenger risk has reduced by 25%. These reductions reflect the exposure of passengers and staff to a high number of non-reportable minor injuries resulting from *slips, trips and falls, assaults* and other non-train incidents. The risk to members of the public is not significantly affected as this risk category is dominated by fatalities.

Risk to exposed groups

New for version 5.5, Chart 2 presents a comparison between the risk to each person category from version 5 of the SRM and version 5.5. The notable changes in the risk to each exposed group are described below:

- Passenger risk has increased marginally by 1.8%, from 43.5 to 44.4 FWI/yr. This can be attributed, in part, to a decrease in risk at the *platform/train interface* alongside an increase in risk associated with passenger *slip, trip or falls* and passenger *on-train incidents*. It should be noted that some of this increase in risk is attributable to a rise in the number of passenger journeys.
- Workforce risk has decreased by 6.5%, from 35.4 to 33.1 FWI/yr. There has been a general reduction in events which involve workforce *working with machinery* (eg trapped in machinery, welding etc). *Workforce assault* risk has decreased due to a reduction in the number of physical assaults. There has also been a decrease in the number of track workers being *struck/crushed by trains*.
- The decrease in member of public risk by 1.5%, from 60.9 to 60.0 FWI/yr, is predominately due to the decrease in *trespass* risk as well as a decrease in the risk associated with pedestrians being *struck/crushed by trains at level crossings* and members of the public being *struck/trapped by level crossing equipment*.

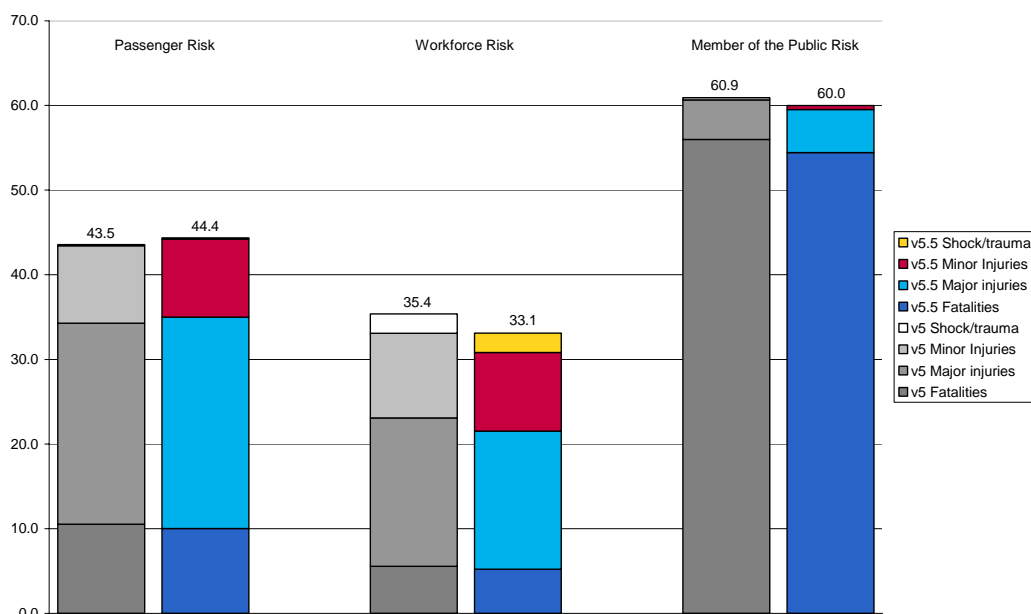


Chart 2: Total risk by person category (comparing v5 and v5.5)



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Chart 3 illustrates the proportion of total risk for each exposed group: within each exposed group what percentage of the risk is from fatalities, major injuries, minor injuries and shock/trauma. It can be seen that risk to members of the public has the highest level of risk, at 44% of the total, followed by passengers (32%) and workforce (24%). For both passengers and workforce, major injuries contribute around 50% of the risk, while fatalities dominate MOP risk (at over 90%). Fatalities contribute 22.6% of the risk to passengers, and 15.8% of the risk to the workforce.

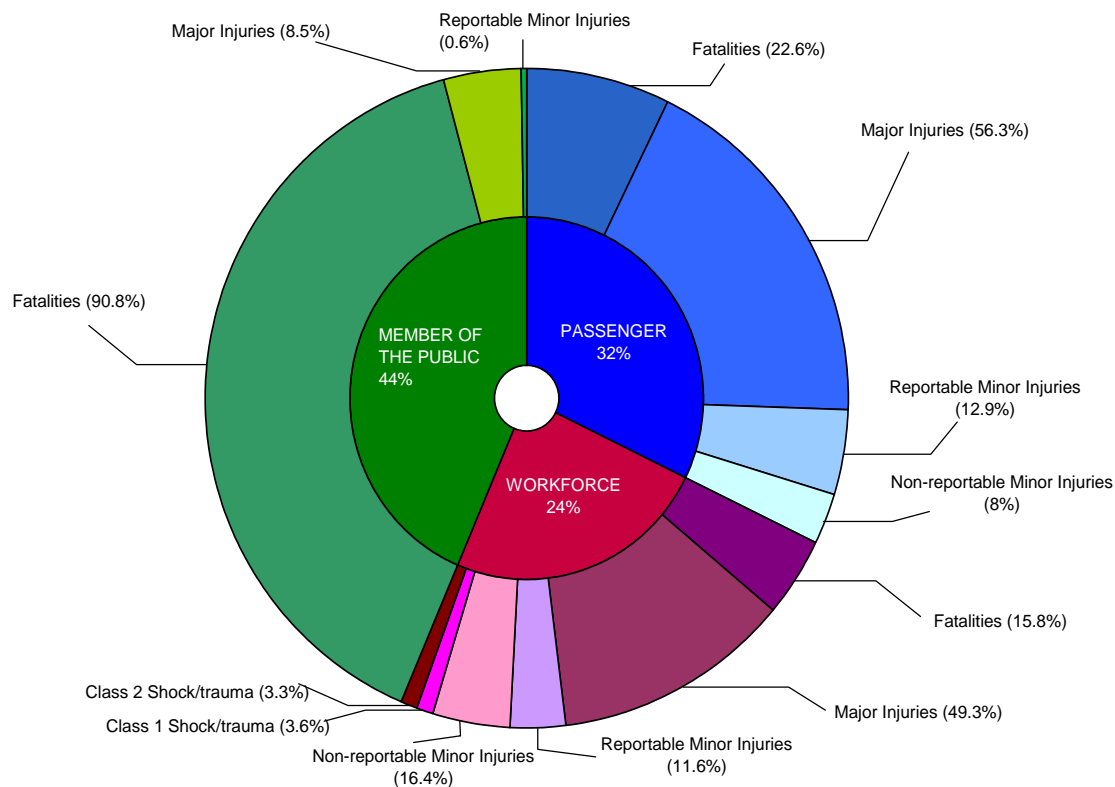


Chart 3: Risk profile for the passengers, workforce and members of the public (% of total FWI/yr)

Note: chart does not show those injury categories which contribute <0.5% of the risk to each person category e.g. Class 1 Shock/trauma to Passenger

Detailed risk profile

In version 5.5 of the RPB, the 125 hazardous events have been grouped into 17 categories. Chart 4 shows the risk profile for these categories, and it can be seen that the greatest risk contribution comes from trespass, at 42.6 FWI/yr. The category with the second highest level of risk is *slips, trips and falls*, with 37.4 FWI/yr. Chart 4 also indicates the percentage change in risk since version 5 (for each category).

It can be seen that the greatest contribution to overall risk comes from *trespass* with 42.6 FWI/year. This category is dominated by MOP fatalities and major injuries. The risk from *trespass* has reduced by 4.9% from version 5. The next highest contribution comes from *slips, trips and falls* with 37.4 FWI/year: the overall risk from this category has increased by 5.6% since version 5. The greatest proportion of risk occurs to passengers (24 FWI/yr).

It can be seen that most of the categories have a level of risk of FWI/yr of >1. Of those categories which contribute significant amounts to the overall risk, only four exceed 10 FWI/yr (*trespass, slips, trips and falls, assaults and stuck/crushed by train*). Nine of the 17 categories have FWI/yr <5, including *platform edge incidents, collisions with road vehicles at level crossings and fires/explosions*.



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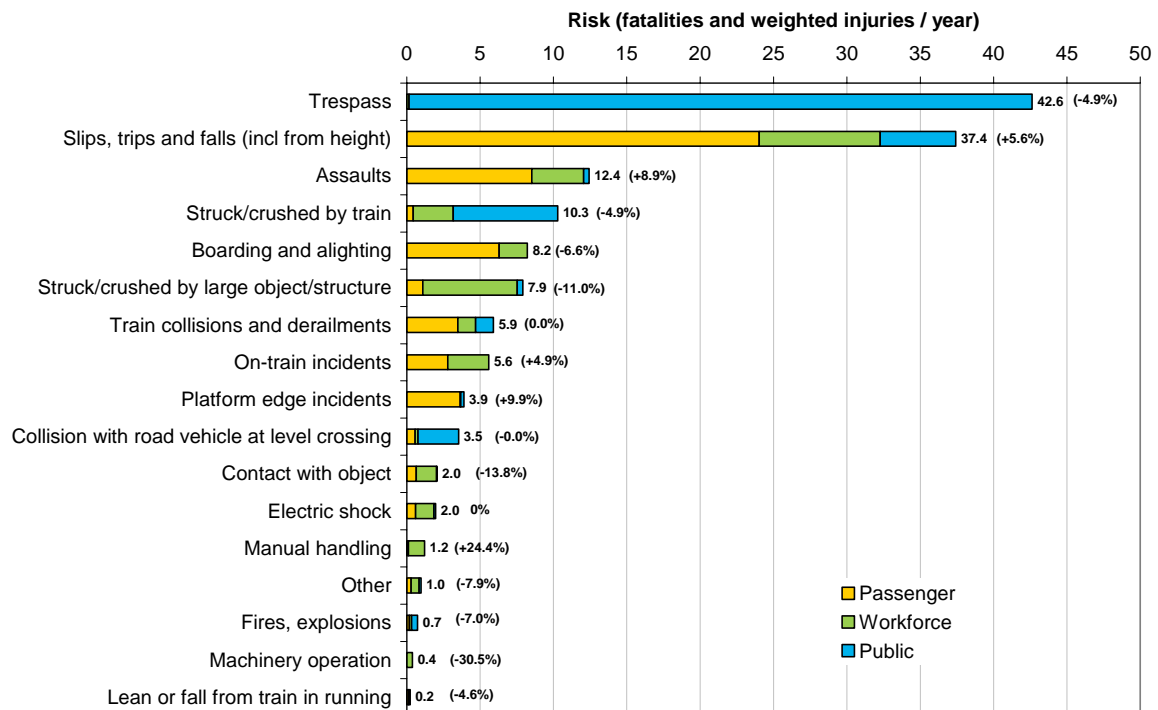


Chart 4: Risk profile for the hazardous events categories

Further information

More detail on these, and other, topics may be found in the RPB version 5.5. A detailed description of the SRM version 5.5, the modelling approach and assumptions are also provided. In addition, the RPB contains risk profiles for each accident type, and for each person category, which show in detail the hazardous events leading to the highest levels of risk.

An explanation of the modelling approach used is also included in the RPB version 5.5, as well as a detailed description of the changes that have occurred since version 5. The system boundaries are described fully, as are the objectives of the SRM. The primary objectives of the SRM are:

- An understanding of the nature of the current risk on the mainline railway.
- Risk information and risk profiles relating to the mainline railway.

Following the update of the SRM Version 5.5² the SRM templates for use with Guidance Note GE/GN8561 (Guidance on the Preparation of Risk Assessments within Railway Safety Cases) will also be updated. GE/GN8561 is also due to be updated during 2008. The templates will enable all operating and maintenance companies to create a comprehensive risk profile associated with their operations.

¹ Department for Transport, 'Delivering a Sustainable Railway', July 2007

² The RPB was published in May 2008. Copies will be sent to all industry stakeholders. For further information, please contact the RSSB enquiry desk on 020 7904 7518