System Safety Learning

At its meeting in May 2011, the RSSB Board was presented with a paper on System Safety Learning.

It highlighted three significant learning opportunities:

• RAIB general lessons for the industry following a review of a formal investigation into a signal failure at Milton Keynes following the installation and commissioning of new infrastructure in 2008.

• The Congressional Report into the BP Deepwater Horizon accident in the Macondo field, Gulf of Mexico.

• Lessons presented by the Nuclear Sector at this year’s Risk Management Forum.

All of these findings identified the need for competent independent challenge and process.

While the industry may have no formal process for cross industry learning, the existence of the RSSB hosted Industry Safety Meetings, the learning from operational experience capability in RSSB and periodic Board reports do provide an opportunity for industry lessons to be debated and disseminated.

The RAIB report contained a number of general learning points for the industry, some of which focused on the need to improve controls associated with the design and development of safety critical software. This generated much debate resulting in Network Rail supporting an industry workshop, hosted by the Railway Industry Association in the autumn, to explore the issues surrounding the control of software and actions that may be appropriate to address.

Recognising that the industry is embarking on a series of major changes including reorganisation within Network Rail, the new approach to franchising and Rail Value for Money implementation, the next Industry Safety Meeting on 16 September 2011 will be considering the ‘Safety Implications of Change’. This will provide industry leaders with the opportunity to understand the planned changes; identify risk implications and opportunities and then consider how to address.

You can subscribe to Information Bulletin on the RSSB website. 
http://www.rssb.co.uk/Publications/Lists/Infosubform.aspx
Annual Safety Performance Report for the financial year 2010/2011 published

In 2010/11, there were 1.4 billion passenger journeys (an 8% increase on 2009/10), 54.5 billion passenger kilometres (a 6% increase) and 18.3 billion tonne kilometres of freight moved (a 4% decrease).

Against this setting, the headlines are:

- There were no passenger or workforce fatalities in train accidents in 2010/11. This is the fourth year in succession with no such fatalities. There were also no fatalities to members of the public in train accidents.
- There were 18 potentially higher-risk train accidents. This is a significant reduction on the previous year’s total of 42, which, at the time, was the lowest number on record. In contrast, the Precursor Indicator Model (PIM), which measures changes in train accident risk based on the occurrence of precursors, stood at 50.4 at the end of the year, compared with 44.0 at the end of 2009/10. At the end of 2010/11, the estimated level of risk from signals passed at danger (SPADs) was higher than the level at the end of 2009/10, but 16% lower than the September 2006 baseline level.
- There were 40 accidental fatalities, 395 major injuries, 11,075 minor injuries and 1,331 cases of shock/trauma. The total level of harm was 100.4 fatalities and weighted injuries (FWI)\(^1\), compared with 130.0 FWI recorded in 2009/10. The main cause of the reduction was a fall in the number of fatalities to members of the public due to trespass.
- Eight passengers died in separate incidents, all at stations. When non-fatal injuries are also taken into account, the total level of passenger harm was 42.6 FWI; this in an increase of 10% on the 38.7 FWI (five fatalities) recorded for 2009/10. Both the fatality total and the FWI total were the highest since 2006/07. When normalised by passenger journeys, the rate of harm shows a 2% increase compared with 2009/10.
- There was one workforce fatality during 2010/11: an infrastructure worker died as a result of a fall from height. Including non-fatal injuries, the total level of workforce harm was 22.9 FWI. This is a reduction of 8% compared with the 25.0FWI (three fatalities) recorded in 2009/10. The rate of harm normalised by workforce hours reduced by 10% compared with 2009/10.
- There were 31 fatalities to members of the public, excluding those due to suicide or suspected suicide. Of the total, 27 were trespassers, and the remaining four were pedestrians at level crossings. Including non-fatal injuries, the total level of public harm was 34.8 FWI, which is 48% lower than the 66.3 FWI recorded for 2009/10. At 208, the number of suicides was close to the average of the previous nine years.

\(^{1}\) Fatality and Weighted injuries (FWI) shows the number of each injury type that is deemed to be ‘statistically equivalent’ to one fatality. Fatality = 1; Major Injury = 10; RIDDOR Reportable minor injury and Class 1 shock/trauma = 200; Non-RIDDOR reportable minor injury and Class 2 shock/trauma = 1000.

A copy of the report can be found on RSSB’s website at http://www.rssb.co.uk/SPR/REPORTS/Pages/default.aspx

Changes to research programme governance

The rail industry needs access to research and innovation in order for it to address the challenges of the present and the future. These challenges include cutting costs and carbon, but at the same time increasing capacity and customer satisfaction; they include growing the business of the railway to generate revenue; and being a long term partner in a sustainable transport system.

However, global financial restraints mean that there is less government funding available, and the shape of demand for research is changing. In response, RSSB has made significant reductions in costs associated with research (£1m pa saved) through a 25% headcount reduction. At the same time RSSB has increased the resources available for technology watch and knowledge searches.

To further enhance the research capability, a number of important changes have been made to the way that RSSB governs research which will affect all stakeholder groups. They came into effect on 1 July 2011. This reflects changes in the research environment, experience of managing the programme, feedback from industry, and principles of good governance.

The changes will:

- Provide wider access to research and development so that any formally constituted cross-industry group can sponsor research, not just RSSB-facilitated groups.
- Give greater industry oversight across the whole programme and RSSB’s management of it.
Passenger risk at the platform-train interface

The platform-train interface gives rise to a risk unique to rail transport. This risk forms a significant proportion of the total risk faced by rail passengers, especially fatality risk.

Mindful of an increase in the number of accidents since 2005, the Operations Focus Group requested that RSSB undertake analysis into accidents occurring to passengers at the platform-train interface.

The report, published in June 2011, contains analyses into the many possible factors that can influence the occurrence of accidents of this type. RSSB's research continues in this area; the final results will be presented to the Operations Focus Group during 2011.

The rail industry is also taking steps to deal with these issues, including improving platform markings, implementing a slip, trip and fall toolkit, risk-assessing train dispatch plans, and fixing reflective strips to door edges and handles to increase visibility. In addition, RED 28 focuses on the PTI issue, by featuring a dramatisation of an incident and suggestions to station operators on how to minimise the hazards.

The report entitled 'Passenger risk at the platform-train interface' is available on the RSSB website.

Management of Route Knowledge

At 16:38 on 22 August 2007 a train service from London Paddington to Worcester Shrub Hill passed SB2209 signal at danger at Didcot North Junction and came to a stand foul of the Up Oxford line shortly after another train had passed clear of the junction. RAIB was advised of the incident and took on the responsibility for investigating the incident.

In RAIB’s report 23/2008 which followed, one of the nine safety requirements recommended RSSB, in consultation with ATOC, and with reference to project T655, to carry out further research into the periodicity of driving turns/refresher training required to acquire and retain route knowledge.

(T655 investigated how route knowledge affects various routes when running in degraded conditions).

ATOC wrote to Train Operating Companies requesting information about their route refreshing policies. From the information supplied it was identified that RSSB should produce a Rail Industry Standard that will provide a common approach to route refreshing, training and assessment. This work was sponsored by the Operations Focus Group.

To get the views of stakeholders, a workshop was held at RSSB on 5 January 2010. The members present confirmed that stakeholders would benefit from the development of a Rail Industry Standard that will include drivers and other staff within its scope and provide a consideration of what should be included in a route learning policy. It was felt that guidance should also be included on risk mitigation measures, competence assessment and alternative methods of route refreshing.

The guidance - RIS-3702-TOM Management of Route Knowledge for Drivers, Driver Managers and other Staff was approved by the Traffic Operations and Management Standards Committee and will be published in September 2011 on www.rgsonline.co.uk
RSSB helps industry boost knowledge sharing capability

Industry’s challenge of simultaneously growing the business and reducing costs is supported by access to research and innovation, with joined-up efforts and cross-industry and cross-country cooperation to get the best value.

The research and development programme managed by RSSB covers all cross-industry and system issues from engineering to operations to management topics and from the short-term to strategic time horizons. The programme is the place the GB rail industry chooses to work together on research.

To help increase the return on investment in R&D for industry and all funders, RSSB is committed to:

• Broadening industry’s access to the programme.
• Creating mutually beneficial knowledge sharing partnerships with other organisations which undertake rail-related research.
• Opening a new on-line web portal for rail industry ‘knowledge sharers’.

In support of this, RSSB is launching a password-protected web portal to be known as SPARK (Sharing Portal for Access to Rail Knowledge) which is to be launched later in the summer. Designed to enable information to be found easily and quickly, at the heart of SPARK will be a library where all users have the opportunity to contribute their knowledge and find something new. SPARK users will effectively become an on-line network of professionals working together to reduce duplication, speed up innovation and maximise value.

SPARK will be the point of entry to a wealth of information about research projects, strategies and initiatives, centres of expertise, testing facilities, data sources, publications and expertise of the community of users.

To further maximise the return on investment in both knowledge and SPARK, access is focussed on RSSB members and cross-industry groups (organisations who make up the GB mainline rail industry). But these will not be the only ‘knowledge sharers’; indeed, RSSB is also looking for other organisations (such as universities and other specialist companies or non-GB mainline rail companies) to set up knowledge sharing partnerships.

Knowledge sharing partners will agree to regularly exchange information, such as research or publications, with RSSB and allow it to be captured in SPARK, and in return have access to SPARK themselves as users.

More information about SPARK will become available throughout the summer as it is launched. For more information on knowledge sharing partnerships, contact RSSB, email: enquirydesk@rssb.co.uk, telephone 020 3142 5400.

Pink Pages get a makeover

The Working Manual for Rail Staff Handling the Carriage of Dangerous Goods (Pink Pages) will be republished for implementation in December 2011. This is the first re-issue since 2006 and takes into account changes to Railway Group Standards and company standards and instructions. The changes have followed industry consultation and approval by the Traffic Operations and Management Standards Committee.

The principal change is that Section E concerning hazard warning labels and placards is withdrawn. However, most of the instructions will be moved into Section B.

A briefing leaflet outlining the changes will be available in September.

Tranche 4 of the Rule Book – New Approach

Module AC and Module DC electrified lines

Module AC and Module DC electrified lines have been fully reviewed in line with the New Approach and the new documents were approved for publication by the Traffic Operations and Management Standards Committee in May. They will come into force in December 2011. The instructions remaining following the review have been split into separate documents.

• Instructions for train drivers, guards, designated persons (DP), signallers, crossing keepers, shunters and persons in charge of sidings will be shown in a re-issued Rule Book Module AC and Rule Book Module DC.

Handbooks 16 and 17 will only contain basic instructions relating to track safety specific to AC electrified lines and DC electrified lines.

The detailed instructions for working on or close to AC overhead line equipment are covered in the Network Rail Specification NR/SP/ELP/29987 Working on or about 25kV
A.C. Electrified Lines. Similarly, the detailed instructions for working on or close to the conductor rail equipment are covered in the Network Rail work instruction NR/WI/ELP/3091.

Other key changes to note are

- Emergency isolation is no longer referred to as an isolation, but as an emergency switch off as it is technically not an isolation. The term PICEI has been changed to PICEE Person In Charge of Electrical Emergency.
- The rules concerning rescuing a person who is at least 1 metre from live OLE have been discontinued. No-one may go above or within 2.75 m (9 feet) of live OLE to carry out a rescue without an emergency switch off.
- A new section 15.5 in Module AC has been added to allow trains to coast at up to permissible speed with pantographs lowered when the OLE is damaged or isolated under specific circumstances. The driver can lower the pantograph at any speed and raise the pantograph at any speed up to 80 mph, or 125 mph if company instructions allow it for the type of traction, provided the location meets the laid down criteria documented in Network Rail instructions. New high speed coasting signs have been introduced which are: an ‘advance lower pantograph’ sign, a ‘lower pantograph’ sign, a ‘raise pantograph’ sign and a ‘do not raise pantograph’ sign.

**Section 15.5 was introduced following the findings of a research project**

**T778 Feasibility study into raising and lowering pantographs while trains are in motion**

sponsored by the Vehicle/Train Energy System Interface Committee and published on the RSSB website.

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**Tranche 5 of the Rule Book – New Approach**

Modules TS9 Level crossings - signallers’ instructions and TW8 Level crossings - driver’s instructions have been fully reviewed in line with the New Approach and the new documents were approved for publication by the Traffic Operations and Management Standards Committee in May. They will come into force in December 2011. There are a number of changes to both documents and these are outlined in the Rule Book Briefing Note which will be published on the RGS Online website www.rgsonline.co.uk in September 2011.

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**Safety Risk Model – Version 7 update**

The Safety Risk Model (SRM) is a comprehensive model of railway risk on the GB mainline network. It comprises 120 hazardous events that could lead to injury or fatality during the operation and maintenance of the railway.

The results of each update of the SRM are contained in the Risk Profile Bulletin (RPB). The RPB is available to download from www.safetyriskmodel.co.uk (registration required) as a pdf document accompanied by Excel data sheets.

Data used to populate version 7 had a cut-off date of 30 September 2010 this was followed by 6 months of modelling work, with the risk figures being available from 30 March 2011. These were then documented in the RPB which was launched to the industry on 30 June 2011.

The SRM outputs are being used by the DfT and ORR for measuring industry performance against the High Level Output Specification (HLOS) safety metrics. Since the start of Control Period 4, the passenger safety metric shows that there has been a 1.8% reduction of passenger risk and a 7.4% reduction in workforce risk.

The overall level of risk, predicted for the railway, in the v7 update, is 141.6 Fatalities and Weighted Injuries per year (FWI/yr). This takes account of predicted under-reporting that was identified in the review of Network Rail’s RIDDOR reporting. The figure excludes direct risk from suicide and attempted suicide except for where there are secondary affects upon passengers and workforce. This can be further broken down into:

- **Passengers** 52.0 FWI/yr
- **Workforce** 27.9 FWI/yr
- **Member of Public** 61.7 FWI/yr

The greatest contribution to overall risk comes from trespass with 48.6 FWI/year.
**SRM Risk Profile Tool**

The SRM - Risk Profile Tool (previously called the SRM Template tool) has been updated to include the SRMv7 data. This tool allows railway undertakings to develop a risk profile of their own operation, using as its basis the SRM. Users can import their own data from SMIS in order to individualise their profile and they can also manually enter alternative data and compare their results with their expected profile based upon the input of company normalisation data.

Further details are available from risk@rssb.co.uk.

**RSSB and TRL forge strategic partnership**

RSSB and TRL have agreed a strategic partnership that is set to combine research expertise in rail alongside broader transport research experience. Each organisation shares a common vision to enhance the value of their services to members and customers around the world.

The organisations are no strangers to each other; TRL has supplied services to RSSB on a number of past industry research projects.

This new partnership has been established to build on the existing relationship and enable the development and application of world class transport research, innovation and technology. It will provide a joint platform to deliver better value and efficiencies that will benefit RSSB members.

The primary focus of the partnership will be:

- Exploring and securing new initiatives and funding streams at an international level (both in Europe and across other areas of the world).

For more information, contact Guy Woodroffe, head of research and development, guy.woodroffe@rssb.co.uk

**The World Congress on Railway Research 2011**

WCRR 2011, the 9th World Congress on Railway Research, was held in Lille, France, from 22 to 26 May 2011. The congress, hosted by SNCF and organised by the WCRR Organising and Executive Committees and on which RSSB represents the GB rail industry, was attended by over 800 participants from 35 countries, representing operators, infrastructure managers, research institutes, the supply industry, academia and other organisations.

The overall theme of WCRR 2011 was “Meeting the challenges for future mobility.” The Congress was organised around eight challenges:

- A more energy-efficient railway
- An environmentally-friendly railway
- Increasing freight capacity and services
- A world of services for passengers
- Bringing the territories closer together at higher speeds
- Even more trains even more on time
- An even more competitive and cost efficient railway
- For an even safer and more secure railway

There were 49 sessions, 220 papers presented and 85 posters displayed, as well as an exhibition. There were major contributions from across the GB rail industry, including speakers, chairs, presenters and ambassadors. Representatives were there from ATOC, Network Rail, suppliers, and academia, Passenger Focus, High Speed2, DfT and RSSB. The Best Young Researcher Award was presented to a RSSB human factors specialist for a presentation of work on non-technical skills.
Vehicle/Track Systems Interface Committee
Annual Seminar 26 October 2011, London

‘Taking a whole-system approach to the vehicle/track interface’

The purpose of the V/T SIC is ‘to assist the railway industry to manage all aspects of the vehicle to track interfaces in the most cost-effective and efficient way.’ Whilst the primary focus of the V/T SIC is set upon the point of contact between the wheel and the rail, it is recognised that many other parameters of the track and rolling stock also affect this interface.

On 26 October 2011, the V/T SIC will hold a one-day seminar in London.

The seminar will present the work undertaken by V/T SIC over the last year and a review of progress since the last event.

Speakers from the V/T SIC and industry-players who have participated in the work will describe the very latest technical understanding, the steps taken in implementing emerging best practice and the focus areas for the next year.

The seminar will also provide the opportunity to meet with many of the experts in this critical field.

Topics to be covered are:

- Developments in Wheel/Rail Understanding and Theory
- Adhesion Research
- Wheelset Management Best Practice
- P12 wheel profile
- Industry Decision Support Tools – VTISM and Track-Ex
- Noise
- Case studies
- European projects
- Future research ideas

Copies of VT SIC’s Wheel/Rail Best Practice Handbook will be available for purchase at the event. The handbook is a comprehensive compilation of articles, sponsored by V/T SIC, from industry experts and practitioners describing the theory and management of vehicle/track interaction on mixed traffic railways.

The seminar is free. If you would like to attend, please send your name, job title, organisation, contact telephone number and email address to conferences@rssb.co.uk. You will receive confirmation of your booking in due course.

For further information on the work of the SICs, please visit
http://www.rssb.co.uk/groups/SIC/VTrack/Pages/default.aspx