



Rail Safety & Standards Board

# INFORMATION BULLETIN

## Research results into seat belts, windows and the industry approach to escape from passenger trains

RSSB published the findings from a five year research programme considering accident survivability. The measures proposed will, RSSB believe, further improve passenger survivability on those rare occasions when accidents do happen.

Analysis of seven train accidents in Britain - Watford, Southall, Ladbroke Grove, Hatfield, Great Heck, Potters Bar and Ufton Nervet (the accident at Grayrigg was not included in this analysis) - has highlighted that a number of passengers were ejected from vehicles, some of whom received fatal injuries. The research RSSB has conducted shows the importance of containing passengers within vehicles during accidents. Keeping passengers within vehicles can be achieved through the use of seat belts or improved windows. RSSB looked at both these areas.

The aim of the research into seat belts was to assess the benefits and disadvantages in terms of passenger safety. The first part considered the use of two-point belts (lap belts as used in commercial aviation) and was published in 2005. The second looked at three-point belts (lap and diagonal belts as used in cars).

The evaluation of both types of seat belts involved a suite of full-scale "sled tests" with crash test dummies and computer modelling to evaluate the effect of different seat spacings and different sizes of passengers. The tests directly compared the use of seat belts against modern design crashworthy seats which deform to reduce injury during an accident. It has found that fitting two-point or three-point belts would, overall, increase passenger injuries and fatalities in a crash situation.

The aim of the research into window requirements was to resolve the conflict between the need for windows to contain passengers during an accident and their potential role in emergency egress or rescue.

Rail industry and glass technology experts agreed that laminated glass provides significantly better passenger containment protection in accidents than toughened glass. Rescue services and paramedics supported the fitment of laminated glass to reduce ejections: they confirmed that they could still access anyone trapped in a train through the new windows.

The research has taken a very thorough look at passenger survival in train accidents. The conclusions are that seat belts would, overall, increase passenger injuries in a crash situation, and that progressively fitting laminated glass will bring additional safety advantages. RSSB has recommended that the industry adopts a common approach to passenger egress in the event of an accident.

RSSB will now initiate changes to relevant Railway Group Standards through the normal process involving railway industry and public consultation. Train operators will consider the application of this approach to their own fleets on an individual basis, including issues such as whether to consider changing windows, and when to change signs and remove hammers.

Copies of the research summary report can be viewed at [http://www.rssb.co.uk/pdf/reports/research/containment\\_review\\_final.pdf](http://www.rssb.co.uk/pdf/reports/research/containment_review_final.pdf)

Copies of the seat belts and windows research briefs can be viewed at

[http://www.rssb.co.uk/pdf/reports/research/T201\\_rb\\_final.pdf](http://www.rssb.co.uk/pdf/reports/research/T201_rb_final.pdf)

[http://www.rssb.co.uk/pdf/reports/research/T424\\_rb\\_final.pdf](http://www.rssb.co.uk/pdf/reports/research/T424_rb_final.pdf)

For more information contact **Jim Lupton, head of engineering research** on 020 7554 4611 or email [jim.lupton@rssb.co.uk](mailto:jim.lupton@rssb.co.uk)

## Standards News

### Railway Group Standards Catalogue – August 2007 edition

Issue 4 of the RGS Catalogue was published on 4 August 2007.

This issue sees a number of changes, however it does not include the recent publication of three GSM-R Rapid Response documents. These documents can be found



on RGSonline ([www.rgsonline.co.uk](http://www.rgsonline.co.uk)) and will appear in October's version of the RGS Catalogue.

Should you have any enquiries relating to the RGS catalogue, CD-ROM or RGSonline please contact the **RSSB enquiry desk** on **020 7904 7518**.

## Driving on sight

In November 2006, the Traffic Operation and Management Standards Committee (TOM SC) – representing train operators and Network Rail – asked RSSB to evaluate a proposed new 'degraded mode' operating procedure, for use when extensive signal failures occur.

The present procedure is called Temporary Block Working (TBW). When TBW is in operation, there are delays while handsignallers are deployed and trains which were trapped when the failure happened cleared, before other trains can start moving through the failure area. Once trains do start moving, line capacity is severely limited by the need to pass one train at a time on each line through the failure area. As a result of these factors, some recent major signalling failures in the South East have caused extended delays to many trains. However, the use of TBW in these situations is a relatively rare event on the network as a whole, and for individual signallers and drivers.

The proposed alternative is known as 'driving on sight' (DoS). It means that once any trapped trains have been located, drivers would be instructed by the signaller to leave the affected area, or proceed through it, 'on sight', relying on what they can see ahead, ready to stop short of any obstruction, including a train in front. It would be a major change from present practice on the mainline railway in Great Britain.

In December 2006, a HAZOP (Hazard and Operability Study) was held with drivers, signallers and others. This was followed by workshops to resolve issues arising from the HAZOP and provided the framework for the assessment phase of the work.

In May, South Eastern Trains and Network Rail (Kent Route) provided staff and access to train cab and signalling simulators at Ashford, to test the DoS procedures in a safe environment with drivers and signallers.

The evaluation was completed by the end of July, on schedule. A summary of the work was presented to Traffic Operation and Management Standards

Committee (TOM SC) on 24 July and more detailed reports are being prepared to be made available to TOM SC members and other key stakeholders during August. TOM SC will discuss the results on 21 August.

More work is needed to fully evaluate DoS but sufficient evidence has been found to indicate that DoS, as proposed, could increase the risk from collisions between trains and would only deliver performance improvements in a limited number of cases. The simulations also showed the importance of managing effectively the period between the failure happening and getting trains moving again: this period is also critical for passengers inside stationary trains, who may decide to take unilateral action to open train doors and leave the train onto the track.

RSSB found that the principal railways in Europe do not use driving on sight for operations in degraded mode, without written orders from the signaller.

RSSB is offering several options for the industry, through TOM SC, to decide a way forward. They include more detailed assessments of DoS as well as streamlining the existing (TBW) procedures.

For further information, please contact **Richard Evans**, head of delivery unit, TOM on **020 7904 7633** or email [richard.evans@rssb.co.uk](mailto:richard.evans@rssb.co.uk)

## GSM-R Rapid Response

RSSB has published three documents in response to a request from industry to publish the technical requirements for the GSM-R cab mobile. The intention is to ensure that specific facilities and capabilities are identified to assist in the approvals process for cab mobile equipment in advance of the first application of GSM-R at Strathclyde scheduled for later this year. It is essential that the technical requirements related to the cab mobile are published in advance of the trial and this was achieved with considerable effort by the project team in which representatives of industry, notably ATOC and Network Rail, played an integral and prominent role. The RSSB contingent comprised members of the Control Command and Signalling and Energy Delivery Unit, the New Systems team and the Human Factors team.

The requirements have been agreed by the GSM-R multifunctional standards committee and encompass the following areas:

- The features and functional operation of the cab mobile with respect to interfaces with the user, for example how the cab mobile reacts to each type of call received
- The user interface requirements to achieve a level of standardisation in terms of operability and user experience, for example the layout of the display screen and the position and spacing of controls



- The requirements for interfacing the cab mobile with the network via the air interface and the SIM card.
- The requirements for interfacing the cab mobile with trainborne systems such as the train electrical supply.

The documents published are as follows:

- The Railway Group Standard GE/RT8082 GSM-R Cab Mobile Great Britain Open Interface Requirements
- The Rail Industry Standard RIS-3082-CCS GSM-R Cab Mobile Great Britain Open Interface Optional Requirements
- The Guidance Note GE/GN8582 Guidance on GSM-R Cab Mobile Great Britain Open Interface Requirements

The structure of the documents is innovative in that the guidance note applies to the Railway Group Standard (RGS) and the Rail Industry Standard (RIS) and indicates which requirements are mandatory (and are set out in the RGS) and which are non-mandatory (and are set out in the RIS).

These are also the first RSSB standards to be published on the web with embedded electronic files, in this case they represent the sound tones to be utilised within the cab mobile design.

To minimise the timescale to the issue of the documents the RSSB rapid response procedure was followed. As required by the Railway Group Standards Code a project to follow the full standards process will be instigated. The results of the first application at Strathclyde will be included in that process as they evolve.

For further information, please contact **Brian Bashford**, **CCS senior project manager** on **020 7904 7973** or email [brian.bashford@rssb.co.uk](mailto:brian.bashford@rssb.co.uk)

## Engineering Safety Management (The Yellow Book), Volume 2, Guidance, Issue 4

August 2007 sees the publication of Engineering Safety Management (The Yellow Book), Volume 2, Guidance, Issue 4. It has been written over the last 2 years under the direction of the Yellow Book Steering Group, which is representative of RSSB members and includes experts from across the rail industry.

Engineering Safety Management (The Yellow Book), Volume 2, Guidance, Issue 4 provides in one integrated

volume, guidance on implementing the fundamentals presented in volume 1. Issue 4 extends the guidance to cover maintenance as well as projects and benefits from some other improvements.

- The guidance has been brought up to date with current legislation and good practice
- High level guidance is provided on the relationship between Engineering Safety Management activities and a System Lifecycle
- High level guidance is provided for those railway professionals whose work affects safety but who control risk through the application of standards, procedures and assessments
- New guidance is provided about Goal Structuring Notation (GSN)
- The guidance on software, Human Factors, systems issues and maintenance, previously published in Yellow Book 'application notes', has been incorporated into volume 2.

The Yellow Book is published by RSSB on behalf of the railway industry as a whole. To view a copy, visit the Yellow Book website ([www.yellowbook-rail.org.uk](http://www.yellowbook-rail.org.uk) or via the Yellow Book link on the RSSB website). A printed version of The Yellow Book (volumes 1 & 2 combined) will be available from September 2007. Engineering Safety Management (The Yellow Book), Volume 1, Fundamentals, Issue 4, which sets out the fundamentals of Engineering Safety Management, was published by RSSB in 2005 and is still available as a separate publication.

Arrangements have been put in place with training suppliers so that updated training courses are available to practitioners. Contact details for training suppliers endorsed by the Yellow Book Steering Group are provided on the Yellow Book website.

For further information, please contact **Richard Barrow**, **CCS engineer** on **020 7983 6746** or email [richard.barrow@rssb.co.uk](mailto:richard.barrow@rssb.co.uk)

Got an issue with a Railway Group Standard? Call the **RSSB Enquiry Desk** on **020 7904 7518** or email [enquirydesk@rssb.co.uk](mailto:enquirydesk@rssb.co.uk)

## Sustainable Rail Programme

### Cross industry Carbon Reduction Working Group

In June 2007 Defra consulted on the implementation of the Carbon Reduction Commitment (CRC) scheme. The aim of CRC is to set up a mandatory emission trading scheme amongst organisations to cap carbon levels at a decreasing rate year on year. Organisations which have



annual electricity consumption in excess of 6,000 MWh from mandatory half hourly meter will be included within this scheme.

This consultation stated that rail's non traction energy will come within this scheme, but Defra would welcome views from the rail industry on 'key issues specific to the rail sector that Government should bear in mind in developing the CRC policy design'.

However, for the time being, Defra has decided to exclude rail's traction energy from the scheme. It requests stakeholder views on 'the best ways to ensure energy efficiency benefit and absolute emission reduction from train energy use'. The rail industry consider a voluntary approach more effective in achieving carbon reductions, so wishes to maintain this exclusion.

The inclusion of traction in the CRC scheme would present a number of risks to the rail industry which include, amongst others,

- Competing modes, such as road and air transport, are not included in the scheme, creating an unfair cost advantage and a perverse incentive against rail
- Electricity suppliers come within the European emission trading scheme. The cost burden from this scheme is passed down to rail through the purchase of electricity. So inclusion of rail traction within the UK scheme would result in a double charge.
- While a metric taking account of efficient growth is proposed, the dominant focus of the scheme is on reducing absolute emissions. The expectation in the DfT's White Paper, July 2007, that rail will accommodate growth of 22.5 per cent will inevitably result in increased energy usage and subsequent carbon emissions. This presents a conflict with the desired aim of the scheme.
- The scheme has no mechanisms to value the major contribution that rail makes, as a low carbon alternative transport, through modal shift from less sustainable transport modes
- The scheme does not take account of the unique structure of the industry with the mix of long life high value assets and the short term nature of franchise
- The scheme does not take account of the existing mechanisms for rail regulation and can therefore create tensions, perversity and unnecessary administration and cost burdens

In light of this a cross industry Carbon Reduction Working Group (CRWG) was set up by the Sustainable Development Steering Group to address issues of carbon reduction within traction energy. Specifically the group will

- Provide a response to the CRC consultation
- Establish the current freight and passenger traction energy consumption data for electricity and diesel and resultant CO<sub>2</sub> emissions
- Propose a baseline year against which traction performance improvements can be measured
- Develop a cross industry position on carbon reduction
- Propose an effective alternative industry-led voluntary agreement

It is expected that the voluntary agreement will work

- Within the existing industry structure
- Seek to maintain and strengthen rails competitive advantage i.e. modal shift
- Support the environmental aims of the Government's White Paper
- Ensure continued DfT support for research and investment in energy efficiency measures

For more information contact **Kathy Findlay**, **sustainable development specialist** on **020 7904 7652** or email [kathy.findlay@rssb.co.uk](mailto:kathy.findlay@rssb.co.uk)

#### Railways - A Sustainable Future

Conference - 31 October 2007, London

Programme -

[http://www.rssb.co.uk/events/sustainable\\_development\\_programme.pdf](http://www.rssb.co.uk/events/sustainable_development_programme.pdf)

Registration form -

[http://www.rssb.co.uk/events/sustainable\\_development\\_registration.doc](http://www.rssb.co.uk/events/sustainable_development_registration.doc)

## Belgian Railways to use GB Safety Risk Model

RSSB and Belgian Railways (NMBS) have agreed a licence arrangement to provide NMBS with access to RSSB's Safety Risk Model (SRM).

The SRM is a risk management tool developed for the rail industry and is used to quantify the significant causes and consequences associated with hazardous events affecting the railway. This enables users to identify key areas of risk associated with their operations and to assist them in the prioritisation of investments in safety, using a risk based approach. It relies on



consistent and comprehensive data capture from the operational railway.

Instead of developing their own company model, NMBS considered the work undertaken by RSSB in the development of the SRM. The expertise already invested by RSSB was as an opportunity to make use of good practice in railway risk assessment and share railway related information between the two organisations.

Within the SNCB-Group the model will be managed by the Risk Office, that is part of the internal audit service of SNCB-Holding. The results from the model will be made available for the Group members Infrabel (Infrastructure Manager) and SNCB (train operator). In the future the SRM will be used as an input to safety decision making, to determine audit and research priorities and to guide specific risk analyses and even accident investigation.

The licensing of RSSB models to overseas railways is an innovation for RSSB which was approved by the RSSB Board. This arrangement is a trial and if it is seen to provide benefits to the licensee and RSSB members it could be adopted more widely.

For more information contact **Colin Dennis, head of risk and safety intelligence** on 020 7904 7499 or email [colin.dennis@rssb.co.uk](mailto:colin.dennis@rssb.co.uk)

## Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) certificate and authorisation workshops

Two workshops were held in June 2007, primarily aimed at those who had not yet submitted their applications for ROGS certificates and authorisations to the ORR. The main objectives of the workshops were to determine:

- The preferred style and layout of the new ROGS certificate and authorisation submissions
- The depth of information required
- The appetite for the production of a framework and supporting guidance by RSSB

Guidance to assist in the implementation of the ROGS Regulations is already available from the ORR. This can be found at <http://www.rail-reg.gov.uk/upload/pdf/283.pdf> and is supported by a manual containing the assessment criteria for certificate and authorisation applications made under ROGS. The assessment criteria manual can be located at <http://www.rail-reg.gov.uk/upload/pdf/285.pdf>.

In support of the ROGS Duty of Cooperation, RSSB has produced a Guide to its activities which has been developed to help RSSB members, transport operators and other relevant stakeholders prepare their company ROGS-compatible safety management systems (SMS) for safety certification and authorisation purposes. The Guide can be located at [http://www.rssb.co.uk/docs/SMS\\_a\\_guide\\_to\\_RSSB\\_activities\\_Issue\\_2.doc](http://www.rssb.co.uk/docs/SMS_a_guide_to_RSSB_activities_Issue_2.doc).

The workshops determined that the ORR's acceptance criteria document and related ROGS Guidance document ostensibly contained sufficient detail and direction to develop the required submission documentation. Some dutyholders produce a 'light' submission document, covering little more than what is required by the acceptance criteria which is separate from their fully documented SMS system.

Based on the above, it is felt that there is no need for RSSB to develop further guidance on behalf of industry concerning the structure and level of detail of submission documents. These documents are intended to give a high-level description of certain aspects of a dutyholder's safety management system and not a full account of all safety management arrangements.

For more information please follow the link to the RSSB website: [http://www.rssb.co.uk/national\\_programmes/sms\\_rogs\\_authorisation.asp](http://www.rssb.co.uk/national_programmes/sms_rogs_authorisation.asp) or contact: **Nigel Finney, sms specialist** on 020 7904 7940 or email [nigel.finney@rssb.co.uk](mailto:nigel.finney@rssb.co.uk)

## European Rail Agency's Acceptance Criteria for safety certificates and safety authorisations under ROGS

RSSB has been asked to review and comment on this draft document by the Office of Rail Regulation (ORR). This draft document has been developed by the European Rail Agency's (ERA) Working Group on Safety Certification and Authorisation. Its purpose is to inform member states' National Safety Authorities of the requirements when assessing conformity of certificate and authorisation submissions. ORR has agreed to trial



the document within the UK rail industry and will be agreeing with the ERA how this will be carried out.

If you would like to comment on the document, please follow the link to the RSSB website:

[http://www.rssb.co.uk/national\\_programmes/sms\\_tasks\\_summaries.asp#\\_Task\\_2:\\_Review](http://www.rssb.co.uk/national_programmes/sms_tasks_summaries.asp#_Task_2:_Review) for a copy of the document and send comments to: **Nigel Finney, sms specialist** on **020 7904 7940** or email [nigel.finney@rssb.co.uk](mailto:nigel.finney@rssb.co.uk)

## Events

Date	Name of event	Location
13 September 2007	RISAS Accreditation Body Conference	Midland Hotel, Derby
14 September 2007	Vehicle Acceptance Body Conference	Midland Hotel, Derby
14 September 2007	A jointly sponsored RSSB and ATOC Shunting and Safety Workshop	The Wellcome Centre, Euston, London
18 September 2007	Driver Training Conference	Lakeside Conference Centre, Aston, Birmingham
31 October 2007	Railways – A Sustainable Future	The Wellcome Centre, Euston, London
8 November 2007	The ROGS One-Year-On Conference	The Wellcome Centre, Euston, London
27 November 2007	Yellow Book Conference	The Congress Centre, London

For more information on these events, please contact **Stella Okezie, conference manager** on **020 7904 7934** or email [stella.okezie@rssb.co.uk](mailto:stella.okezie@rssb.co.uk)

## Industry study on specialist resource shortages

Transport for London, the Department for Transport and London Development Agency have commissioned Franklin + Andrews to undertake an Industry Study in response to growing concerns about resource

shortages within specialist engineering, technical and planning disciplines that relate to the road and rail sectors.

In order to bring the industry together and ensure industry views are adequately accounted for, it is planned to undertake a consultation process across the industry. The first part of this is the formation of a representative Industry Liaison Group (ILG) to act as a co-ordination and communication point for the industry, help facilitate the industry consultation process and finally help develop required methodologies and solutions. RSSB have been invited to be a member of the ILG and attended the first meeting on 24th July.

For further information contact **Lesley Hodsdon, workforce development specialist** on **020 7904 7969** or email [lesley.hodsdon@rssb.co.uk](mailto:lesley.hodsdon@rssb.co.uk)

## Spotlight

### Coping with suicides on the railway

Since 2003 the number of suicides and suspected suicides on the mainline railway has increased from 185 to 219 in 2006. Each suicide is a tragedy for the family and friends of those involved and also result in considerable disruption to the railway system, not to mention the personal impact on railway staff involved.

The rise in suicides at stations was debated at the June RSSB Board as part of their review of the Public Behaviour papers and in response, wrote to all Train Operating Companies (TOCs) with information on the sources of help that are available to try and help reduce the number of suicides at stations. Enclosed with the letter was a copy of a leaflet entitled 'Reducing suicides at railway stations'. This guidance was produced last year by Samaritans in association with RSSB and ATOC. The leaflet explains that Samaritans can offer advice on measures that TOCs can take including providing posters for display at stations and delivering awareness training for station staff, which would help them to identify individuals at risk and to make appropriate interventions.

The letter also referred to a guide that has been produced by RSSB to assist staff who may experience trauma caused by fatalities. The guide can be downloaded from the RSSB website: [http://www.rssb.co.uk/pdf/reports/research/T317\\_rpt\\_final.pdf](http://www.rssb.co.uk/pdf/reports/research/T317_rpt_final.pdf)

A review meeting has been organised between Network Rail and National Express, as representative of train operators, at RSSB on 6 September to further review and develop an industry response.

If you would like any further information or advice on suicide reduction, please contact **020 7904 7674** or email [community.safety@rssb.co.uk](mailto:community.safety@rssb.co.uk)