



Rail Safety & Standards Board

RC

Published by

Rail Safety and Standards Board
Evergreen House
160 Euston Road
London NW1 2DX

© Copyright 2008
Rail Safety and Standards Board Limited

GM/RC2533

Recommendations for Communication of Emergency and Safety Information

Issue One: June 2008
Railway Group Recommendations for GM/RT2130



Documents

Document Sharing Hub

Recommendations for Communication of Emergency and Safety Information

Issue Record

Issue	Date	Comments
One	June 2008	Original document Supersedes parts of sections 5, 6 and 7, sections 8, 9, 10 and 11, all appendices except H of AV/ST9005

Superseded documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
AV/ST9005, issue two, November 2003 Vehicle Interiors Communication of Safety and Emergency Information	Part of sections 5, 6 and 7, sections 8, 9, 10 and 11 All appendices except H	02 August 2008

Other parts of AV/ST9005 issue two are superseded by GM/RT2130, issue one, Vehicle Fire, **Safety** and Evacuation.

AV/ST9005 ceases to be in force and is withdrawn as of 02 August 2008.

Supply

Controlled and uncontrolled copies of this Railway Group Code of Practice may be obtained from the Corporate Communications Department, Rail **Safety** and Standards Board, Evergreen House, 160 Euston Road, London NW1 2DX, telephone 020 7904 7518 or e-mail enquiries@rssb.co.uk. Railway Group Standards and associated documents can also be viewed at www.rgsonline.co.uk.

Recommendations for Communication of Emergency and Safety Information

Contents

Section	Description	Page
Part 1	Introduction	4
1.1	Purpose and structure of this document	4
1.2	Copyright	4
1.3	Approval and authorisation of this document	4
Part 2	Recommendations for Communication of Emergency and Safety Information	5
2.1	Background	5
2.2	Provision of information	6
2.3	General signage requirements	7
2.4	Information for passengers	8
2.5	Review and evaluation	15
2.6	Records	16
Appendices		17
Appendix A	Emergency and Safety Signs: Check List for Internal Passenger Areas (including areas provided for employees / contractors on non-passenger vehicles)	17
Appendix B	Emergency and Safety Signs: Check List For Driving Cabs, Guard, Conductor and Van Areas	19
Appendix C	Emergency and Safety Signs: Check List for Vehicle Exteriors	20
Appendix D	Define Audience – Checklist	21
Appendix E	Visual Media – Checklist	22
Appendix F	Detail Design – Guidance	23
Appendix G	Design – Checklist	28
Definitions		33
References		34

Recommendations for Communication of Emergency and Safety Information

Part 1 Introduction

1.1 Purpose and structure of this document

This document has been published by Rail **Safety** and Standards Board (RSSB) to give details of a recommended method which, if followed, would meet the requirements of Railway Group Standard GM/RT2130.

Should a railway undertaking choose not to follow the recommended method of meeting the requirements of GM/RT2130 laid out in this document, it should assure itself that the method it is following is as effective, and no less safe, than the method that is recommended here.

Relevant requirements in GM/RT2130 are reproduced in the sections that follow. Recommendations are provided as a series of sequentially numbered clauses prefixed 'RC'.

Specific responsibilities and compliance requirements are laid down in the Railway Group Standard itself.

1.2 Copyright

Copyright in the Railway Group documents is owned by Rail **Safety** and Standards Board Limited. All rights are hereby reserved. No Railway Group document (in whole or in part) may be reproduced, stored in a retrieval system, or transmitted, in any form or means, without the prior written permission of Rail **Safety** and Standards Board Limited, or as expressly permitted by law.

RSSB members are granted copyright licence in accordance with the Constitution Agreement relating to Rail **Safety** and Standards Board Limited.

In circumstances where Rail **Safety** and Standards Board Limited has granted a particular person or organisation permission to copy extracts from Railway Group documents, Rail **Safety** and Standards Board Limited accepts no responsibility for, and excludes all liability in connection with, the use of such extracts, or any claims arising therefrom. This disclaimer applies to all forms of media in which extracts from Railway Group documents may be reproduced.

1.3 Approval and authorisation of this document

The content of this document was approved by:

Rolling Stock Standards Committee on 18 January 2008.

This document was authorised by RSSB on 16 April 2008.

Recommendations for Communication of Emergency and Safety Information

Part 2 Recommendations for Communication of Emergency and Safety Information

2.1 Background

RC001 Evidence from past railway accidents indicates that improvements to signage in rail vehicles would improve passenger **safety**. Specifically it was found that an improvement to the provision, presentation and commonality of **safety information** was required. The lessons learnt from accidents and incidents will be partially addressed by the production of this document. This document builds on existing best practice and takes on board some of the findings of research following the Ladbroke Grove Rail Inquiry.

Other relevant documents are as follows:

ITL/GN0001	Graphics guidelines for safety signs (available at www.rgsonline.co.uk)
ITL/GN0002	Guidelines for symbol design and testing (available at www.rgsonline.co.uk)
ATOC Engineering Extranet Site – Safety Signs	The ATOC Engineering Extranet is an on-line resource that includes documentation and downloadable artwork relating to passenger safety signs and symbols (www.atoc.org). This includes the following: A searchable database of signage that has been produced in accordance with ITL/GN0001 and ITL/GN0002
The Health and Safety (Safety Signs and Signals) Regulations 1996	
BS 5378: Part 1:1980	Safety signs and colours. Specification for colour and design (superseded)
BS 5378: Part 2:1980	Safety signs and colours. Specification for colorimetric and photometric properties of materials
BS 5378: Part 3:1982	Safety signs and colours. Specification for additional signs to those given in BS5378: part 1 (superseded)
BS 5499: Part 1: 2002	Graphical symbols and signs. Safety signs, including fire safety signs. Specification for geometric shapes, colours and layout
BS 5499: Part 5: 2002	Graphical symbols and signs. Safety signs, including fire safety signs. Signs with specific safety meaning
BS 5499: Part 6: 2002	Graphical symbols and signs. Safety signs, including fire safety signs. Creation and design of graphical symbols for use in safety signs
BS ISO 9186: 2001	Graphical symbols. Test methods for judged comprehensibility and comprehension
BS ISO 80416-2: 2001	Basic principles for graphical symbols for use on equipment. Form and use of arrows
DIN 67510	Long time afterglowing pigments and products Part 1 and Part 2

Recommendations for Communication of Emergency and Safety Information

Railway **Safety** Principles and Guidance: Part 2 Section F Guidance on trains

BR/BCT 610

Public **information** on train **safety** and emergencies

BR/BCT 610 gives advice and guidance to the designers of **information** delivery systems. This document draws heavily on that advice and guidance.

2.2 Provision of **information**

GM/RT2130 Vehicle Fire, **Safety** and Evacuation

6.1 Provision of **information**

6.1.1 **Emergency** and **safety information** shall be provided to mitigate against the risks to people from the train and from the train operating in its particular environment.

RC002 Suitable and sufficient risk and need assessments should be undertaken to identify risks to people from the train and from the train operating in its particular environment. Such assessments should take account of the following considerations (this is not an exhaustive list):

RC003 For trains:

- a) Driver only operation or driver and guard operation
- b) Other train staff
- c) Type of door system (internal and external)
- d) **Emergency** evacuation devices and systems
- e) **Emergency** equipment
- f) **Emergency** escape devices and systems
- g) Evacuation procedures and routes
- h) Escape procedures and routes.

RC004 For stations:

- a) Staffed
- b) Unstaffed
- c) Passenger **information** systems (auditory, visual or tactile etc)
- d) Platform / train relationship (gaps, length etc)
- e) Lighting
- f) Accessibility.

RC005 For routes:

- a) Overhead electrification
- b) Third / fourth rail electrification
- c) Tunnels, bridges, viaducts, embankments, cuttings, proximity of adjacent track and restrictive clearances.

Recommendations for Communication of Emergency and Safety Information

RC006 For the type of train service:

- a) The length of journey and number of stops
- b) The train destination, for example ports, airports etc
- c) Inter-city
- d) Inter-urban
- e) Commuter
- f) Urban
- g) Rural.

RC007 For people:

- a) Train staff
- b) Disabled people (see Appendix D)
- c) Elderly people
- d) Young people
- e) Expectant mothers
- f) Non-English speaking people
- g) Those with reading impairments
- h) The size and stature of people, as relevant, in the above.

2.3 General signage requirements

GM/RT2130 Vehicle Fire, **Safety** and Evacuation

6.2 General signage requirements

6.2.1 **Emergency** and **safety** signs shall be provided on rail vehicles to identify to persons conveyed by or working on rail vehicles, and to persons attending **emergency** situations:

- a) The location, access and operation of equipment or facilities provided for use in an **emergency**
- b) Actions that are prohibited for reasons of **safety**
- c) Objects, actions, hazards and situations which affect or could affect **safety**
- d) Instructions that are mandatory for the purposes of **safety**.

RC008 Appendices A to C of this document provide general check lists for the provision of **emergency** and **safety** signs on rail vehicles. It should be noted that the check lists are not necessarily exhaustive and do not reflect all possible arrangements of equipment and facilities.

6.2.2 Provision of **emergency** and **safety** signs on rail vehicles shall be to a recognised railway standard set to give consistency across the railway and which takes account of the requirements in the Health and **Safety** (**Safety** Signs and Signals) Regulations 1996, supported by BS 5378 and BS 5499.

Recommendations for Communication of Emergency and Safety Information

6.2.3 The railway undertaking shall:

- a) Ensure that new or additional signs that are provided where other equipment or arrangements exist meet the requirements in the Regulations and in this document
- b) Approve both the provision and specification of these new or additional **emergency** and **safety** signs on a vehicle type basis.

RC009 Signage should, where possible, be designed and validated in accordance with documents ITL/GN0001 and ITL/GN0002 respectively (available at www.rgsonline.co.uk). They should, where possible, be selected from the validated signs contained in the **Safety** Signs section of the ATOC Engineering Extranet Site. Where appropriate signs are not available they should be developed and validated in accordance with the above two documents.

2.4 Information for passengers

2.4.1 General requirements

GM/RT2130 Vehicle Fire, **Safety and Evacuation**

6.3.1 General requirement

6.3.1.1 **Emergency** and **safety information** shall be provided for passengers on trains to enable them to act in a foreseeable and pre-determined way.

RC010 Such **information** should be suitable and sufficient, given the risks involved, and standardised as far as reasonably practicable between similar types of vehicle performing similar duties. Due cognisance should be given to the need for consistency across fleets.

RC011 The **safety** provisions and systems for each vehicle should be summarised in a single reference poster or equivalent for passenger education and **information**, and this should be readily available to all passengers.

RC012 **Emergency information** should be provided in each passenger carrying vehicle. The **information** provided should be in a form that can be quickly assimilated by passengers. Wherever possible, visual **information** provided for this purpose should be in the form of pictograms rather than words. The **information** should include details of the location and purpose of the passenger communication equipment.

RC013 The objective of the **information** design is to guide people to act in a foreseeable and pre-determined way. To achieve this objective, the designer should recognise the five steps involved in people receiving and acting on **information**, namely that **information** should be:

- a) Detected
- b) Discriminated
- c) Identified
- d) Understood
- e) Interpreted correctly.

2.4.2 Process of delivery

GM/RT2130 Vehicle Fire, **Safety and Evacuation**

6.3.2 Process of delivery

6.3.2.1 Train **emergency** and **safety** procedures shall be communicated to passengers in a readily comprehensible manner.

Recommendations for Communication of Emergency and Safety Information

- RC014 Passengers should be made aware of the issues surrounding train **emergency** and **safety** procedures before such situations arise by a process of delivery of **emergency** and **safety information**.
- RC015 Where this is to be achieved by exposure to the message even prior to boarding the train, for example posters at stations, **information** on pocket timetables and advertising literature etc, a consistent and recognisable format should be taken at each stage.
- RC016 It is likely that a combination of media will be required to deliver **safety** and **emergency** messages. However, symbols and pictograms should be used wherever practicable. Further guidance on the effectiveness of various media is given in 2.4.7 of this document.
- RC017 The design of the **information** delivery system should consider all issues required, ensuring that it is effective. This should include the following phases:
- The pre-design phase - determining **information** content, audience and contextual constraints
 - The design phase - formulating draft designs and alternatives
 - The post-design phase - evaluating the design and identifying any amendments required and incorporating them into the design.
- RC018 This document gives recommendations on these issues.
- RC019 The elements of this process will have implications for how the messages are sequenced, how and where they are delivered and what assumptions need to be considered.

2.4.3 Determination of **information** content

GM/RT2130 Vehicle Fire **Safety** and Evacuation

6.3.3 **Information** content

6.3.3.1 Before an **information** system is designed, an analysis shall be undertaken of what the passenger needs to know and how this **information** is to be provided.

- RC020 Passenger data should normally be collected by survey, observation or questionnaire to identify passenger expectations and assumptions. Passenger interviews over a representative cross-section of the population will help to elicit additional **information**. The content of the passenger **information** should be considered after conducting a task analysis of the required passenger behaviour. This should be done in a hierarchical manner, such that the desired passenger top-level goal is stated first, for example 'Travel to destination B'. This should then be broken down into functions detailing up to eight sequential activities that need to be achieved to perform the top level goal, for example '... go to station, buy ticket, go to platform, board the train,... etc'. These activities should be analysed and broken down further if necessary.
- RC021 When warning messages are required then these should be used to alert, inform and state the required action. Informing passengers in this sense describes why they need to behave in a certain way. As this is an opportunity to give relevant **safety** and **emergency** data, the message should remain short and simple and not instil panic. Informing is normally reserved for situations where the action is counter-intuitive or particularly hazardous. For each message that is considered necessary the designer should consider and formulate answers to the following questions:
- What message is being portrayed - is it general or specific?
 - Why is the message required (purpose)?
 - What outcomes need to be achieved – to inform, to instruct, to prohibit, to warn, etc (function)?

Recommendations for Communication of Emergency and Safety Information

- d) What is the hazard (description)?
- e) What should passengers do (action)?
- f) What should passengers not do (avoid)?
- g) What will happen (effect)?
- h) What should passengers do next (subsequent)?

2.4.4 Limitations of content

RC022 The designer should make provision for the following possible limitations concerning the content of the message:

- a) Lack of understanding - the message should be designed for maximum comprehension and clarity to avoid misinterpretation, and should be clearly laid out and accurate.
- b) Over-demanding requirements - actions should be within the individual's capabilities. Instructions should be simple, noticeable, and positioned for usability. **Information** should be provided in several locations where necessary, to ensure that if it is missed once it is seen or heard elsewhere.
- c) Action interruption - if individuals are interrupted whilst performing an action it is likely that part of this action sequence will be forgotten. Visual instructions should be placed where they are to be used and the action sequence made obvious.
- d) Social influences - **information** should be made available at various locations to encourage readership. It should be designed to encourage personal responsibility.
- e) Random mental processing - passengers may hear or read **information** but not consciously process it. They may also have 'mental blocks' so that they do not activate the right action sequence. Instructions should be timely, clear and simple, conspicuous and positioned effectively if visual.
- f) Uninformed action - risks should be clearly explained, enabling passengers to take appropriate action in the event of an **emergency**.
- g) Memory retention - instructions should be timely, clearly and simply laid out, and positioned effectively.

2.4.5 User variability

GM/RT2130 Vehicle Fire **Safety** and Evacuation

6.3.4 User variability

- 6.3.4.1 The railway undertaking shall take account of likely passenger limitations, behaviours and expectations to anticipate realistically how **information** will be acted upon. The role of the **information** is to explain the situation and potential risks to enable the passengers to decide the appropriate action they should take.

RC023 Warnings and general **information** often do not lead to the required behaviours. The reader makes a cost / benefit analysis (cost of compliance versus risk of not complying). The result of this analysis identifies that person's behaviour. Even the best warning signs will not override the beliefs and expectations that the individual brings to the situation.

RC024 The passenger population in rail travel is extremely varied. The checklist in Appendix D of this document considers the passenger population and factors that may lead to undesirable behaviour. As a design rule, unless otherwise agreed for special circumstances, the designer should assume that all the groups identified in Appendix D of this document are present in the passenger population and should be catered for. Pre-design analysis and testing of prototype messages should represent a cross section of these limiting users.

Recommendations for Communication of Emergency and Safety Information

The document BS ISO 9186 provides assistance to the designer when testing for comprehensibility of signs and especially graphical symbols.

2.4.6 Contextual constraints

GM/RT2130 Vehicle Fire, **Safety** and Evacuation

6.3.5 Determine contextual constraints

6.3.5.1 The contextual constraints appropriate to the vehicle operation shall be determined and taken into account.

RC025 Factors considered should include, but not be limited to, the following:

- a) Vandalism - visual **information** which has been defaced offers either no **information** or the wrong **information**. **Information** should be located in areas where abuse is less likely to occur. In addition, signs and posters should be maintained appropriately, for example cleaned or replaced when damaged.
- b) Sensitive **information** - in certain situations it is permissible to hide sensitive **information** until it is required. Although the concerns about abuse are reasonable, there is little point in providing **safety** equipment without adequate instructions.
- c) Dirt - visual **information** which is dirty loses its intended impact. Signs and posters should be cleaned or replaced when necessary.
- d) Post incident and **emergency** conditions - all **emergency** signs, as well as signs that remain relevant during an **emergency**, should remain visible under conditions of demised light without a train power supply. These requirements should cover such features as train escape and exit points, routes to exits, door releases, **emergency** hammers, **emergency** and first aid equipment including fire extinguishers. Where these requirements are to be met with the use of photo-luminescent materials they should comply with the minimum requirements of DIN 67510 Part 1 and Part 2 and be compliant for a class B material.
- e) Space availability - where the optimally sized sign or poster cannot physically fit in the most appropriate space available, the decision should prioritise the visibility over the precise location at the point of need.
- f) Ambient noise - a particular constraint for auditory **information** delivery is the extent of the ambient noise level, for example when fast trains pass through stations. Opening windows in trains and particular operational situations (such as during acceleration or passing through tunnels) should also be considered. Consideration should be given to where and when **information** will be most audible.
- g) Aesthetics - aesthetic considerations should not prejudice the effectiveness of a sign. The functional design of a sign or **information** system should have priority over the aesthetic consideration of the sign and its placement.
- h) Sequence - delivery of **information** should follow the sequence of activities that passengers will perform. This is to ensure that **information** is placed where it will be seen and where and when it will be needed. Visual messages should be placed where they will attract sufficient attention and portray the **information** required at the time of greatest need. An instruction on how to operate a piece of equipment should be so placed that it is still readable whilst obeying the instruction.
- i) Number of messages - the number of messages should be considered by reviewing how passengers will perform their required activities and how they might miss **information**.
- j) Obscuration - the designer should consider whether messages might be obscured during operation of the vehicle, for example by luggage.