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Guidance on the Carriage of Dangerous Goods by Rail
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Rail Industry Guidance Note



Documents

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Guidance on the Carriage of Dangerous Goods by Rail

Issue record

Issue	Date	Comments
One	April 2008	Original document
Two	December 2009	Replaces issue one (to update references to legislation, other RGS related documents and time sensitive terms)
Three	March 2013	Replaces issue two as a small scale change. Amendments are limited to the deletion of section 3.7 regarding special requirements not considered within the general / standard packaging conditions and updating references and time sensitive terms.

Amended or additional parts of revised pages have been marked by a vertical black line in the adjacent margin.

Superseded documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GO/GN3676 Guidance on the Carriage of Dangerous Goods by Rail, issue two	All	02 March 2013

GO/GN3676 issue 2 ceases to be in force and is withdrawn as of 02 March 2013.

Supply

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Guidance on the Carriage of Dangerous Goods by Rail

Part 1 Introduction

G 1.1 Purpose of this document

- G 1.1.1 This document has been published by the Rail Safety and Standards Board to give guidance on the carriage of dangerous goods by rail. This guidance is intended to assist duty holders in understanding their responsibilities in relation to the carriage of dangerous goods by rail. It does not constitute a recommended method of meeting any set of mandatory requirements.
- G 1.1.2 This document has been amended under the Railway Group Standards Code (Issue Three) as a small scale change. Reference to the amendments has been made in the 'Issue record'. All other parts of the document are unchanged from the previous issue.

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G 1.3 Approval and authorisation of this document

- G 1.3.1 The content of this document was approved by Traffic Operation and Management Standards Committee on 11 December 2012.
- G 1.3.2 This document was authorised by RSSB on 25 January 2013.

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Part 2 Guidance on the Carriage of Dangerous Goods by Rail

G 2.1 Regime for carriage

G 2.1.1 General

G 2.1.1.1 The regime for the carriage of dangerous goods by rail is based on application of statutory requirements and Railway Group Standards. Whilst references are made to these requirements in the following text, it is essential that the actual documents are examined to identify specific requirements.

G 2.1.2 Statutory requirements – Introduction

G 2.1.2.1 A list of the principal statutory and other government requirements and recommendations applicable to the carriage by rail of dangerous goods is contained in the References section. The objectives of these regulations may be summarised as follows.

G 2.1.3 Statutory requirements - The Railways and Other Guided Transport Systems (Safety) Regulations 2006

G 2.1.3.1 Infrastructure managers and railway undertakings have to hold either a Safety Authorisation (infrastructure manager) or Safety Certificate (railway undertaking). This should address the arrangements for carrying dangerous goods, where this is appropriate.

G 2.1.3.2 The carriage of dangerous goods, where this is not covered by an existing Safety Certificate, would require a change to that Safety Certificate. A significant change to a dangerous goods carriage operation, eg a new flow of traffic, may also constitute a material change requiring a change to a Safety Certificate.

G 2.1.4 Statutory requirements - The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (CDG)

G 2.1.4.1 These regulations identify the framework necessary to control the carriage of dangerous goods on the railway. They establish a chain of responsibility linking the various parties from before the dangerous goods are placed on the railway until after they are removed. They refer to Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) for most of the detailed requirements (see section 2.1.8). They also include permitted derogations from RID, many of which appear in the associated Secretary of State for Transport document entitled Dangerous Goods: Approved Derogations and Transitional Provisions (see Appendix B).

G 2.1.4.2 The CDG Regulations are revised and reissued every two years (2011, 2013, etc.) to align with the RID Regulations (see section 2.1.8) that are also revised and reissued to the same timescale. Where references are made to either CDG or RID they refer to the version in force. Stakeholders should ensure that they are referring to the most up to date version of those regulations.

G 2.1.5 Statutory requirements - The Ionising Radiations Regulations 1999 (IRR)

G 2.1.5.1 These regulations impose duties on employers to protect employees and other persons against ionising radiation arising from work with radioactive substances and other sources of ionising radiation including during transport. They also impose certain duties on employees.

G 2.1.6 Statutory requirements - The Nuclear Industries Security Regulations 2003 (as amended)

G 2.1.6.1 These regulations make provision for the protection of nuclear material, both on sites and in transit, against the risks of theft, sabotage, and for the protection of sensitive nuclear information, such as on-site security arrangements. In particular, they require the maintenance of approved security plans for each nuclear site. The transport of nuclear materials is only allowed under the regulations by carriers approved by the Office for Civil Nuclear Security, who must submit a general security statement as well as a transport plan for each nuclear material movement.

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G 2.1.7 Other requirements and recommendations - United Nations Recommendations on the Transport of Dangerous Goods - Model Regulations

G 2.1.7.1 Committees organised under UN auspices develop requirements for the identification, packaging and carriage of dangerous goods. These relate to transport in packages, intermediate bulk containers (IBCs), large packagings, bulk containers and portable tanks. They are issued two-yearly and set a benchmark for the development of national and international rules and regulations.

G 2.1.8 Other requirements and recommendations - Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID)

G 2.1.8.1 These regulations apply to dangerous goods consigned to or from continental Europe by rail. When railway wagons carrying dangerous goods are moved by shipping services, over particular routes, special conditions attached to RID requirements also apply.

G 2.1.8.2 RID also forms the basis of the requirements for the national carriage of dangerous goods by rail in CDG (see section 2.1.4).

G 2.1.9 Other requirements and recommendations - Eurotunnel conditions

G 2.1.9.1 Eurotunnel PLC sets conditions for rail carriage of dangerous goods through the Channel Tunnel, based on RID but more onerous, to ensure a safe rail operation in the tunnel. These conditions are approved by the Anglo-French Inter-Governmental Commission.

G 2.1.10 Other requirements and recommendations - International Maritime Dangerous Goods (IMDG) Code

G 2.1.10.1 These conditions, developed by the International Maritime Organization, apply to carriage by sea not covered in section 2.1.8, in particular to deep sea movements.

G 2.1.11 Other requirements and recommendations - International Atomic Energy Agency (IAEA) Regulations

G 2.1.11.1 The IAEA issues regulations for its own use and for adoption by member states. The acceptance and carriage conditions for radioactive material contained in RID and CDG reflect IAEA Regulations.

G 2.1.12 Rail Safety and Standards Board publications - Description

G 2.1.12.1 Railway Group Standards are issued by the Rail Safety and Standards Board (RSSB), they set mandatory requirements for safety and safe interworking applicable to the railway infrastructure. Railway Group Standards are supported by codes of practice, guidance notes and good practice guides also issued by RSSB.

G 2.1.12.2 All Railway Group Standards that have been published are identified in a listing issued at regular intervals by RSSB. In addition, amendments to working level documents, such as Railway Group Standard GO/RT3053, are issued both through the Weekly Operating Notice (WON) and the Periodical Operating Notice (PON) procedure.

G 2.1.12.3 Specific requirements are contained in the following Railway Group Standards or as appendices to this Guidance Note:

a) GE/RT8000 Rule Book

The Rule Book contains operating rules, in a task based modular format.

b) GE/RT8047 Reporting of Safety Related Information

This contains requirements for reporting defined incidents and irregularities involving dangerous goods (and some non-dangerous goods). The standard also covers data recording as an input to the management of safe carriage, by focusing on system weaknesses.

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c) GO/RT3421 Dangerous Goods – Rail Conditions of Acceptance

This mandates additional requirements for the carriage of dangerous goods by rail in Great Britain. These requirements are in addition to the requirements mandated by RID.

d) GO/RT3053 – Working Manual for Rail Staff: Handling and Carriage of Dangerous Goods (Pink Pages)

Detailed operational requirements for the acceptance and movement of dangerous goods, to be applied by drivers, train preparers, yard staff and operations control, are covered as additional requirements to those contained in the Rule Book. Particular aspects are:

- i) Definitions (glossary of terms).
- ii) Classification, acceptance and identification.
- iii) Package labels and wagon / container placards.
- iv) Marshalling, movement and loading.
- v) Dangerous goods facility instructions.
- vi) Identification of dangerous goods (hazard identification).
- vii) Fires and incidents.
- viii) Emergency transhipment.
- ix) List of dangerous goods with their UN number, dangerous goods class, and TOPS commodity code.
- x) Separation and segregation. (These requirements have been validated by quantified risk assessment as presenting an acceptable level of risk).

Short notice amendments may be issued in PONs and WONS.

e) GO/RT3056 – Working Manual for Rail Staff - Freight Train Operations (White Pages)

This contains requirements for freight train formation, movement, reporting arrangements for defective wagons and wagon loading. Short notice amendments may be issued in PONs and WONS.

f) GE/GN8532 – Guidance Note: Railway Fog Signals

This document identifies arrangements for the safe supply, storage, management and disposal of railway fog signals.

g) GO/GN3653 – Guidance for Safe Freight Train Operation

This document provides guidance to the infrastructure manager (IM) and railway undertakings (RUs) regarding the loading, preparation and operation of freight vehicles and trains. It also provides guidance on the information that staff need to ensure they clearly understand matters relating to design, loading, preparation and operation of freight vehicles.

G 2.1.13 Other rail information - Rail Safety First

G 2.1.13.1 This DVD (Rail Safety First), produced by Network Rail, includes a section on dangerous goods on the railway, along with supporting documents, and is targeted at the personnel of the emergency services.

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G 2.2 Containment methods

G 2.2.1 General

G 2.2.1.1 Containment systems and containment integrity are at the heart of dangerous goods regimes. Dangerous goods are contained in various ways, reflecting their properties and their hazard potential should release occur. The following aspects are involved and form part of the conditions of acceptance.

G 2.2.2 Packaged (including radioactive material) - All sizes

G 2.2.2.1 Dangerous goods have to be packed in a suitable manner. Packaging, including intermediate bulk containers (IBCs) and large packaging, have to meet certain performance test requirements designed to ensure that they can withstand normal conditions of carriage and thereby achieve the desired safety levels. Some packaging for radioactive materials have to be designated to withstand accident conditions. In this respect CDG is applicable.

G 2.2.3 Containers

G 2.2.3.1 In general, containers have to meet the requirements of the International Convention on Safe Containers implemented in the UK as The Freight Containers (Safety Convention) Regulations 1984. In addition, swap-bodies are covered by these regulations, these being freight containers designed for carriage by rail and road.

G 2.2.4 Tanks

G 2.2.4.1 These are in the form of tank wagons, tank containers, portable tanks or road tankers, suitably constructed for the traffic they are to carry. They are required to conform to the requirements of RID, IMDG Code and the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) as appropriate.

G 2.2.5 Bulk

G 2.2.5.1 Certain dangerous goods can be carried unpackaged (eg without any intermediate form of containment) in wagons and containers.

G 2.2.6 Piggyback

G 2.2.6.1 This involves the carriage of road vehicles (which may be road tankers) on railway wagons. Whilst most road vehicles are acceptable on piggyback services, some road tankers (such as those used for petrol) are built to significantly different requirements than those for rail tank wagons (and tank containers). It is considered that it would be difficult to control the additional risks presented by these particular road tankers to the level of risk presented by rail tank wagons. Tanks of vented non-pressure road tank vehicles containing products in Class 3, packing groups I and II, are therefore only acceptable on piggyback services if they are designed and constructed in accordance with the requirements of the ADR.

G 2.3 Risk management

G 2.3.1 General

G 2.3.1.1 The carriage of dangerous goods by railway undertakings, principally freight operating companies, imports additional risks onto the railway infrastructure. Dangerous goods are not carried on the railway infrastructure where the risks associated with carriage are determined to be at an intolerable level. In all other cases, risks are managed to a level that is As Low As Reasonably Practicable (ALARP). It is necessary to have a management system and to apply controls so that:

- a) The dangerous goods are properly identified.
- b) The risks involved are understood.
- c) Containment systems are applied that are appropriate to the properties and quantities of the dangerous goods involved.
- d) By the application of appropriate operational arrangements, integrity of the containment system is maintained from acceptance until handover at destination.

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- e) The consequential risks are mitigated should an accidental release occur.
- f) Training and instruction ensures that the personnel involved are competent to carry out their duties.

G 2.3.1.2 This guidance is intended to help ensure that the various requirements relating to safe carriage are properly considered before new traffic flows are accepted, and when checking existing arrangements.

G 2.3.2 Routeing - Dangerous goods requirements

G 2.3.2.1 The safe carriage of dangerous goods is generally achieved by ensuring containment integrity, without the need for specified routeing. Containment requirements are identified in regulatory and rail industry requirements and guidance. These are complemented by operational requirements including mitigation measures should an incident occur. Questions of routeing options need to recognise these and address all factors that contribute to the overall risk and not only 'worst case', low probability / high consequence incidents.

G 2.3.3 Routeing - Major hazard dangerous goods

G 2.3.3.1 Major hazard dangerous goods represent a particular potential risk for which specific consideration should be given to routeing during the process of planning for carriage. These dangerous goods are:

- a) Class 1 Explosives excluding hazard division 1.4 other than some detonators, cords and charges.
- b) Class 2.1 Flammable gases in tanks only.
- c) Class 2.3 Toxic gases.
- d) Class 3 Flammable liquids of packing groups I and II in tanks only.
- e) Class 3 Desensitized explosives.
- f) Class 4.1 Desensitized explosives.
- g) Class 4.2 Spontaneously combustible substances of packing group I in tanks only.
- h) Class 4.3 Substances which in contact with water emit flammable gases of packing group I in tanks only.
- i) Class 5.1 Oxidizing liquids of packing group I in tanks only.
- j) Class 5.1 Perchlorates, ammonium nitrate, ammonium nitrate fertilizers and ammonium nitrate emulsions or suspensions or gels in tanks or in bulk only.
- k) Class 6.1 Toxic substances of packing group I.
- l) Class 6.2 Infectious substances of category A (UN 2814 and UN 2900).
- m) Class 7 Radioactive material (3000 A1 (special form) or 3000 A2, as applicable, in type B or type C packages).
- n) Class 8 Corrosive substances of packing group I in tanks only.

G 2.3.3.2 These are also regarded as high consequence dangerous goods in relation to security. A security plan is required for these dangerous goods which will include routeing considerations (see section 2.3.4).

G 2.3.4 Routeing considerations

G 2.3.4.1 When new flows of major hazard dangerous goods are being planned for carriage, the options for routeing should be considered jointly by the IM and RU to determine whether the overall risk of a particular rail route is safer than any alternatives that exist.

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G 2.3.5 Routeing - Mitigation

- G 2.3.5.1 Consideration should be given to mitigation measures that may be applied to reduce individual identified risks (eg adjustments to train services plans), or physical work (eg emergency service access improvements).

G 2.3.6 Routeing - Considering and weighting alternatives

- G 2.3.6.1 A key need is to compare risks between the routeing options, where there are alternatives bearing in mind that the carriage of major hazard dangerous goods by rail is recognised by the Health and Safety Executive (HSE) as presenting a tolerable risk.
- G 2.3.6.2 It should not normally be necessary to apply quantitative risk assessment. This approach may however be appropriate if there are particular concerns about the identified risks and if these are broadly comparable for the rail routeing options being compared.

G 2.3.7 Security considerations

- G 2.3.7.1 Chapter 1.10 of RID via CDG (see section 2.1.4) makes provision for the security of dangerous goods by rail, both in transit sites and during carriage. The requirements cover the identification of carriers, the security of sites, trains and wagons involved in the movement of dangerous goods and proper identification and training of staff involved. Special provision is made for the carriage of high consequence dangerous goods (see section 2.3.3) which entails the drawing up and implementation of a security plan. Guidance on how to comply with security requirements for dangerous goods carried by rail is given on the Department for Transport (DfT) website <http://www.dft.gov.uk> under transport security, dangerous goods.

G 2.4 Systems and controls

G 2.4.1 Track access

- G 2.4.1.1 Railway undertakings can only operate services, divert services or stable trains on a temporary basis on the railway infrastructure, as specified within the provisions of a track access agreement with the infrastructure manager. An access agreement also specifies the vehicles to be used and the service characteristics.

G 2.4.2 Documentation

- G 2.4.2.1 Consignment documentation for dangerous goods movements is in most cases processed by electronic means. However, hard copy detail is required for hazardous and special waste (in accordance with the Control of Pollution Act 1974 as amended, and the Environmental Protection Act 1990 and regulations made under these Acts) and for radioactive materials in accordance with Appendix E of this Guidance Note. Hard copy information is also required for explosives in accordance with POMSTER (see References section).

G 2.4.3 Safety related information

- G 2.4.3.1 Information related to the dangerous goods being carried, for example, wagon number, wagon status, UN number and specialist contact details, as required by GO/RT3053, should be input to an electronic information system. This will be done principally by the railway undertaking, but with some information input by other organisations such as consignors and wagon operators / maintainers. All inputting organisations have to ensure that details relating to this information:
- Are correctly entered into the system.
 - Are entered at the appropriate time.
 - Are kept up-to-date and accurate.
 - Properly reflect the status and location of the wagon involved.
- G 2.4.3.2 Wagon operators / maintainers should input details relating to maintenance of individual wagons.