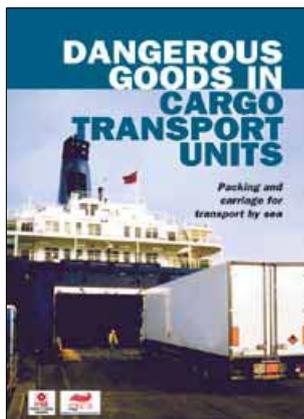


Dangerous goods in cargo transport units

Packing and carriage for transport by sea



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This guidance focuses on the transportation of dangerous goods by sea inside cargo transport units (CTUs).

The safe transportation of this type of cargo relies upon the correct packing, securing and labelling of both packages and the CTUs and there can be wide-ranging implications at any point along the journey from manufacturer to customer, including the sea voyage itself if procedures are not followed correctly.

The guidance is aimed at packers, stevedores, freight forwarders, hauliers, ship operators and masters and those involved with unpacking CTUs.

It offers practical guidance and advice as opposed to a detailed interpretation of the law.

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This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

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Introduction

1 Incidents involving packaged dangerous goods inside a cargo transport unit (CTU) can have wide-ranging effects at any point on the journey from manufacturer to customer, including the sea voyage. People who are potentially at risk include packers, road/rail users, stevedores, customs officials, ships' crews and passengers, and those unpacking the CTU. There may also be a risk to the marine environment. If the legal requirements have not been met, the integrity of the cargo may not be maintained, and insurance cover may also be affected.

2 The safe carriage of packaged dangerous goods relies upon the correct packing, securing and labelling of both packages and CTUs. This guidance provides practical advice to those involved, rather than a detailed interpretation of the law. It has been produced jointly by the Health and Safety Executive (HSE) and the Maritime and Coastguard Agency (MCA), with help from industry. It does not cover the additional requirements for the transport of dangerous goods which are also wastes. Appendix 1 defines terms used throughout this publication.

Scope of guidance

3 This guidance is for those involved in sending dangerous goods in CTUs for carriage by sea. It concentrates on dangerous goods in packages, including intermediate bulk containers (IBCs). It does not deal with the selection, filling or labelling of packages. Information on this is available elsewhere.^{1,2}

4 The definition of a CTU normally includes road tank vehicles and railway tank wagons. There is specific legislation and guidance relating to these,^{3,4} and this book does not cover them. Tank containers and portable tanks are also types of CTUs. Tank containers (often called ISO tank containers) differ from many other freight containers, in that the dangerous substance is loaded in bulk. They are not dealt with in detail in this guidance. However, the same general principles apply and many of the requirements are the same. In particular, shippers (consignors) need to ensure that tank containers are correctly placarded and marked and that dangerous goods declarations are completed.

5 Dangerous goods include explosives and radioactive material - International Maritime Dangerous Goods (IMDG) Classes 1 and 7. This guidance does not deal fully with the packing of explosives or the carriage of radioactive material. Specific advice and guidance on these matters are available elsewhere.^{5,6,7,8,9} Where appropriate, this book refers to relevant explosives legislation.

6 This guidance considers transport of CTUs to ports by road, but many CTUs are transported by rail. The general principles regarding packing and placarding are the same. However, this publication only acts as a starting point for considering the requirements for rail journeys. The Carriage of Dangerous Goods by Rail Regulations (CDGRail2) are relevant and further guidance is available elsewhere.¹⁰

The problem

7 Goods on board ships are subject to stresses in all directions; these are particularly significant during handling, transfer and bad weather. Significant stresses also arise on shore, for example during road or rail transfer and handling at ports and warehouses. This means that poor stowage or securing of packages within the CTU is liable to cause serious problems both at sea and on land.

8 Damage to cargo and failure to comply with legal requirements are common, and expose people to danger. Surveys point in particular to the following problems:

- improperly stowed and secured packages within CTUs;
- inappropriate packaging;
- incorrect marking and labelling of packages;
- stowage of incompatible cargoes in the same CTU;
- non-declaration of dangerous goods, or incorrect documentation (including incomplete or missing container packing certificates and vehicle declarations);
- hazard placards missing from CTUs; and
- incorrect or inadequate hazard information.

9 Any system for ensuring the safe carriage of dangerous goods needs to cover six distinct elements:

- the strength, integrity, labelling and marking of individual packages;
- the selection of an appropriate CTU;
- the safe loading of packages into a CTU;
- the adequate securing of packages within a CTU against the stresses encountered during sea transport;
- the correct placarding and marking of a CTU; and
- the provision of appropriate documentation, including sufficient information about hazards to allow safe handling in normal circumstances and emergencies. Documentation must include:
 - a container packing certificate/vehicle declaration;
 - a dangerous goods declaration; and
 - advance notice to the port.

Legal and international requirements

10 The main legislation relevant to the safe packing, handling and carriage of packaged dangerous goods in CTUs for transport by sea is listed in the References section. Key duties are imposed by:

- the Health and Safety at Work etc Act 1974 (HSWA);
- the Freight Containers (Safety Convention) Regulations 1984 (FC(SC));
- the Carriage of Dangerous Goods by Road Regulations 1996 (CDGRoad);
- the Dangerous Substances in Harbour Areas Regulations 1987 (DSHAR); and
- the Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 (MS(DG&MP)).

This guidance does not explore the detail of the law, but explains in practical terms what those involved need to do.

International requirements for carriage by sea

11 The principal safety guidelines for packing CTUs for sea transport are contained in the *Guidelines for packing cargo transport units (Packing Guidelines)*¹¹ which form part of the International Maritime Dangerous Goods Code (IMDG Code).² Individual countries are responsible for implementing the IMDG requirements under domestic legislation. In the United Kingdom this is mainly done through the Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 (MS(DG&MP)). The Dangerous Substances in Harbour Areas Regulations 1987 (DSHAR)^{12,13} also implement elements of IMDG in Great Britain, with parallel legal requirements in force in Northern Ireland.¹⁴

12 The IMDG Code contains internationally agreed requirements for the safe transport of dangerous goods by sea. Although it is primarily aimed at shipping operators, its requirements affect everyone else involved in the transport chain, from the manufacturer of the dangerous goods through to the customer. If you have responsibilities and duties under the legislation, you need access to an up-to-date copy of the Code itself, or to an information system providing expert guidance on its detailed requirements, as well as to the relevant UK legislation and merchant shipping notices.

CTUs which have been refrigerated using solid carbon dioxide or fumigated

13 The IMDG Code also applies to CTUs which have been refrigerated using dry ice or which have been fumigated, irrespective of whether or not the cargo they are carrying includes dangerous goods. Appendix 2 contains further information.

Enforcement

14 The HSWA and associated legislation such as DSHAR is generally enforced by HSE in docks in Great Britain. However, parts of DSHAR are enforced by statutory harbour authorities. In Northern Ireland the equivalent legislation is enforced by the Department of Economic Development (NIDED), or, for explosives, by the Northern Ireland Office (NIO) or the Royal Ulster Constabulary (RUC).

15 The same enforcing authorities cover container depots where the main activity is the storage of goods in transit to or from dock premises, an airport or a railway. The people covered by the legislation here include shore-based personnel such as packers, shippers, lorry drivers and stevedores.

16 MCA's marine surveyors enforce the Merchant Shipping Acts and associated legislation relating to the safety of ships and their passengers, the health and safety of ships' crews and the prevention of marine pollution throughout the United Kingdom.

Duties under the legislation

17 Four participants in the transport chain have responsibilities for ensuring safety up to the point where the CTU is loaded onto a ship. These are:

- the shipper or consignor who consigns the dangerous goods for carriage;
- the organisation which packs the goods into the CTU;
- the freight forwarder or agent (if any); and
- the haulier who conveys the CTU to a port

18 Transport operations are often complex. Those involved may fulfil a number of functions and have different responsibilities at different parts of the transport chain.

19 With one exception, legal duties cannot be subcontracted or passed on. It is therefore important that those involved fully understand their responsibilities and what they have to do.

20 The only duty which can be transferred is the responsibility for delivering a dangerous goods declaration and container packing certificate/vehicle declaration to a ship's operator or master. These documents can be passed on to a forwarder or other related person for onward delivery (eg at a roll-on/roll-off terminal).

21 It is vital that everybody involved in the transport of dangerous goods, including their packing and despatch, is properly trained. Appendix 3 reproduces the recommendations on training in the *UN Recommendations on the transport of dangerous goods*.¹⁵

22 The rest of this guidance looks at each of the key roles in turn. Appendix 4 summarises the legal duties and Appendix 5 provides a checklist for the different groups involved.

The packer

23 Packers do not necessarily work for the manufacturer of the dangerous goods. They may act on behalf of the manufacturer, freight forwarder, exporter, supplier, packing company or consolidator. Packers have a key role in ensuring the safe transport of dangerous goods in packages, and are often the last people to look inside a CTU until it is opened at its final destination. The people who rely on the skill of the packers include drivers of road vehicles, railway workers, customs officials, dock workers, ship's crew and the final consignee.

24 Management arrangements in the organisation carrying out the packing need to ensure that the people who do the work are properly trained in the principles of safe packing, and are properly supervised. Training should cover:

- compatibility of packaged goods;
- segregation of non-compatible goods;
- weights of packages and load distribution; and
- securing, bracing and dunnage.

Further advice is given in BS 5073: 1982 *Stowage of goods in freight containers*¹⁶ and the Packing Guidelines.¹¹

25 The duties of the packing company cover five key areas:

- **The packages** - all packages must be suitable, properly labelled and in a satisfactory condition. The definition of a package includes the export cases, cartons, drums, IBCs or other packaging surrounding the dangerous goods.
- **The cargo transport unit (CTU)** - this must be in a satisfactory condition to take the load.
- **Packing** - packers need to work to a loading plan which ensures the packages are stowed safely and properly secured in the CTU. The plan should take into account any special agreement made with the recipient. Checks need to be made on the weights of the packages to ensure a safe load distribution and to prevent the maximum permitted gross mass of the CTU being exceeded.
- **Placarding** - the CTU must display the appropriate hazard warning placards, marks and signs.
- **Documentation** - proper written information concerning the loading and the potential hazards must be made available to the next person to handle the CTU.

The packages

26 All packaging must be suitable. In particular:

- it must prevent any of the contents escaping under the normal stresses of handling and carriage by sea, including adverse weather conditions and rough handling;
- it must not be overfilled;
- all parts which are liable to come into contact with the contents must be made of materials which will not be weakened by the contents, and which will not react with them to create a hazard;
- packagings must be type-tested and approved by a competent authority (usually known as UN tested and approved) and marked accordingly - the IMDG Code allows a few exceptions for certain small packagings when used for less hazardous types of dangerous goods (known as 'limited quantities'); and

- packages must be clearly marked and labelled as required by the IMDG Code. Except for 'limited quantities', this means marking or labelling with:
 - the proper shipping name (otherwise known as the designation);
 - the UN number of the contents;
 - the class label (also known as the danger sign or primary hazard diamond);
 - any subsidiary risk label (also known as the subsidiary hazard sign or secondary hazard diamond); and
 - the marine pollutant mark (where relevant).

27 The condition of the packages must be checked before packing into a CTU. If packaging is damaged, stained or otherwise suspect, the people doing the work will need to get advice before continuing (see Section 10 of the General Introduction to the IMDG Code).

28 The hazards of the goods should be identified on the package warning labels. In many cases the labels include some of the key safety precautions. In addition, suppliers of dangerous goods for use in Great Britain must provide information on risks and precautions under section 6 of the HSWA. This is usually done by means of safety data sheets. Guidance on these is available in *Safety data sheets for substances and preparations dangerous for supply*.¹⁷

29 If you are responsible for packing CTUs, you need this information to ensure the safety of the people doing the work. Under health and safety law, you have duties to carry out risk assessments and to provide appropriate plant, information, instruction, training and supervision. You need to give special thought to action in the event of leaks during packing. Further guidance on relevant health and safety law is available in other publications.^{18,19,20}

The cargo transport unit (CTU)

30 You need to ensure that systems of work for your packers include visual inspection of the CTU to ensure it is in a suitable condition before starting to load.

31 In particular, if the CTU is a freight container, your packers need to check that:

- it is suitable for the load;
- it carries a valid safety approval plate, as required by the Freight Container (Safety Convention) Regulations (FC(SC));
- the markings on the container concerning maximum gross load etc are consistent with those on the plate;
- it is clean and dry, with no residues from previous cargo or fumigation;
- it is in good structural condition, with fittings maintained and securely closing doors; and
- there are no irrelevant markings, labels, placards, signs or panels on the outside of the CTU.

32 Any container which is damaged or contaminated should not be loaded. Owners and lessees of CTUs have a legal duty to ensure that they are properly maintained.

Packing

33 The guidance in the Packing Guidelines¹¹ and in British Standard 5073¹⁶ covers packing of the CTU.

Planning

34 Systems of work for packing need to ensure that careful thought is given in advance to the sequence in which the work is done. The loading plan does not have to be in writing, although this might be appropriate for some operations. In all cases, however, the people who put the packages into the CTU need clear instructions.

35 When preparing a loading plan remember:

- if dangerous goods comprise only part of a load, they should preferably be placed near the doors, or in another easily accessible position with the hazard labels visible;
- to stow drums of dangerous goods upright unless otherwise authorised by a competent authority; and
- to keep incompatible goods away from each other; and
- to avoid overloading.

Segregation

36 Section 15 of the General Introduction to the IMDG Code contains guidance on the segregation of dangerous goods. Segregation must be in accordance with the most stringent requirements for any of the individual goods concerned and must take account of subsidiary hazards. If you are responsible for stowing dangerous goods together in CTUs, you must ensure that goods which the IMDG Code requires to be 'segregated from' each other are not packed into the same CTU.

Prevention of overloading

37 The total gross mass of the packed CTU must not exceed the maximum gross mass marked on the safety approval plate.

38 The load in the CTU should, as far as practicable, be evenly distributed over the length and width of the container with no more than 60% of the cargo mass concentrated in either half of the container's length.

Use of vehicles inside CTUs

39 Containers can be damaged by the use of mechanical handling devices inside them. Systems of work need to ensure that the people doing the packing follow any instructions from the CTU manufacturer or supplier about this. It is especially important to consider whether the floors of containers may be affected before using lift trucks. Further advice on this is given in HSE guidance *Safety in the use of freight containers*.²¹

Securing the load

40 It is extremely important to ensure that all items of cargo are secured and braced in the CTU. Further advice on this is given in *Safety in the use of freight containers*,²¹ as well as in the Packing Guidelines¹¹ and in BS 5073.¹⁶

41 Ensure that your packers close the doors of the CTU firmly and secure them safely when loading is complete.

Placarding and marking the CTU

42 You must ensure that any hazard warning placards, marine pollutant marks etc required by the IMDG Code are displayed on the CTU:

- IMDG placards, marks and signs - Appendix 6 gives examples of these;
- UN Number - this must be displayed on tanks and bulk packagings. It should only be displayed on CTUs containing packaged dangerous goods if they all have the same UN number and make up a 'full load', ie there are no other goods in the CTU; and
- proper shipping name, as listed in the IMDG Code - this must be displayed on tanks and bulk packagings. It should only be displayed on CTUs containing packaged dangerous goods if they all have the same UN number, make up a 'full load' and do not need a placard or marine pollutant mark.

43 All placards, marks and signs on the CTU must be clear, durable and securely fixed. Subsidiary hazard placards must be displayed if appropriate (see Section 7 of the General Introduction to the IMDG Code). A CTU containing residues of dangerous or polluting goods should still clearly display the appropriate placards etc.

44 The IMDG Code requires placards to be displayed as follows:

- on a freight container, semi-trailer or portable tank - one on each side and one on each end of the unit;
- on a railway wagon - at least on each side;
- on a multiple compartment tank containing two or more dangerous goods or their residues - along each side of the tank at the position of each relevant compartment; or
- on any other CTU - at least on both sides and on the back of the unit.

Documentation

45 A signed container packing certificate or vehicle declaration must be issued once the container has been packed. In some instances, CTUs are part-loaded at several sites. A responsible person at each site must sign a declaration regarding the packing of the CTU. These declarations must follow the CTU through the subsequent stages of packing. The person responsible for packing the last goods must complete the final packing certificate. The MS(DG&MP) Regulations prohibit a ship's operator or master from accepting any consignment in a CTU without a valid container packing certificate/vehicle declaration, except for goods carried in tanks, which require neither.

46 The packing certificate/vehicle declaration must identify the CTU, and the place and date of packing. It must also include the name and signature of the person who was responsible for ensuring that the CTU was packed properly, as well as details of their position and the organisation they work for. It can be in electronic form, but if so, the person who would otherwise sign it needs to be clearly identified. It should certify that:

- the vehicle or container was clean, dry and apparently fit to receive packages;
- all packages have been externally inspected for damage, and only sound packages loaded;
- no incompatible goods have been packed into the vehicle or container, unless specially authorised by the competent authority;
- all drums have been stood in an upright position, unless otherwise authorised by the competent authority;

- all packages have been properly packed in the vehicle or container and secured;
- the vehicle or container and packages are properly placarded, marked and labelled; and
- the dangerous goods declaration has been received for each consignment in the vehicle or container.

47 There are additional requirements for solid carbon dioxide used for cooling, bulk packagings and certain explosives. You can find details in Section 12.3.7 of the General Introduction to the IMDG Code.

48 Packers must also provide information to enable the shipper to discharge their duties. The container packing certificate/vehicle declaration is not the same as the dangerous goods declaration which the shipper has to provide, although for convenience they often appear on the same document, eg on the Simpler Trade Procedures Board (SITPRO) Dangerous Goods Note.²² The declaration and the certificate require separate signatures and will often be signed by different people.

49 The text for a packers' pocket card is at Appendix 7.

The shipper

50 Once loading is complete and a container packing certificate or vehicle declaration has been issued, the shipper or consignor is responsible for making arrangements to transfer the CTU to a port for shipment. The shipper may be a freight forwarder, consolidator, manufacturer, exporter or supplier.

51 The shipper's main duties are to ensure that:

- the CTU and its contents satisfy all the relevant requirements before they start their journey; and
- the haulier transferring the CTU to the port, and the ship's operator or master, are supplied with the correct documentation, and any other information they need to carry the consignment safely and comply with their duties. If the shippers are the owners or lessees of the container, they must also ensure that it is properly maintained.

52 Although the information required for the haulier and the ship's master are not identical, and slightly different terminology is used for each, in practice they are very similar. The documentation required for the ship's operator or master can be used to provide most and sometimes all of the information and declarations required by the haulier, providing the shipper ensures that it reaches both of them.²³

Information for hauliers

53 If you are a shipper you are not responsible for ensuring that hauliers comply with the law on the carriage of dangerous goods by road, unless you are also the operator of the vehicle. However, you must ensure that hauliers are provided with the information they need to carry the consignment safely and comply with the law. In particular, you need to ensure that operators of the vehicles or trains moving the CTU are provided with:

- sufficient information about the hazards of the goods to enable the operator to comply with the requirements for notice of entry to a port in regulation 6 of DSHAR;

- the information on the goods required by the appropriate road and rail carriage regulations, ie
 - CDGRoad for the carriage of all dangerous goods by road except for: radioactive materials, when the Radioactive Materials (Road Transport (Great Britain) Regulations 1996 (RAMRoad) apply; and explosives, when the Carriage of Explosives by Road Regulations 1996 (CER2) apply; and
 - CDGRail2 for the carriage of all dangerous goods by rail, except for radioactive materials, when the Packaging, Labelling and Carriage of Radioactive Material by Rail Regulations 1996 (RAMRail) apply.

54 To satisfy the requirements for carriage by road and rail you need to provide:

- the designation (proper shipping name) of the goods;
- their classification (class) and their UN number - you can find these from either the IMDG Code or the Approved Carriage List.²⁴ The latter does not cover explosives or radioactive material; for these see the List of Classified and Authorised Explosives (LOCAE)²⁵ or RAMRoad respectively;
- information on the degree of hazard: for carriage by rail this is the packing group (if any); for carriage by road this is the transport category (usually but not always the same as the packing group);
- any control or emergency temperatures specified for the goods (only applies to certain unstable substances);
- how much is being carried, either in terms of:
 - mass or volume (as appropriate) and number of individual packages, tanks and containers; or
 - for each transport category, the sum of the mass or volume of individual packages, tanks and containers; or
 - in the case of explosives, the total net mass of explosives and the number of packages;
- the name and address of the consignor (shipper);
- the name and address of the consignee;
- in the case of carriage by road, any additional information the haulier needs in order to ensure that the driver has the necessary emergency information and (where appropriate) the Emergency Action Code and prescribed temperature;
- a 'consignor's declaration', ie a statement signed or authorised by the consignor (shipper) confirming that:
 - the goods as presented may be carried;
 - the goods and anything they are in are correctly labelled and in a fit condition for carriage; and
 - any mixed packing of different goods in an overpack or single container is allowed.

55 You must provide the information in documentary form, for example on transport emergency cards (TREMCAEDs), letter, telex, fax or e-mail. The declaration must be signed, or otherwise legally validated, for example by using a company stamp, PIN number or computer to show that the consignor made it.

Information for ship operators or masters

56 If you are a shipper or consignor, you must also ensure that the ship's owner or master is provided with:

- the container packing certificate/vehicle declaration; and
- a signed dangerous goods declaration; and/or
- a marine pollutant declaration;

or the appropriate electronic equivalents.

57 Dangerous goods and marine pollutant declarations must be signed and dated by the person making them. They must also include their name and details of their position and the organisation they work for. The declarations can be in electronic form, but if so, the person who would otherwise sign them needs to be clearly identified. The declarations may also be combined. They must contain as appropriate:

- the proper shipping name of the goods, plus any supplementary description required by the IMDG Code (this is the same as the 'designation' for carriage by road or rail);
- the class of substance to which the goods belong (and division when assigned) plus, for explosives, the compatibility group (this is the same as the 'classification' for carriage by road or rail);
- the UN number;
- the packaging group where applicable (this is the same as the packing group for carriage by road or rail);
- the type and number of packages;
- the total quantity of dangerous substances covered by the declaration (volume or mass, except in the case of Class 1 goods for which it is the net mass of the explosives);
- the words 'MARINE POLLUTANT' when applicable;
- the closed cup flashpoint, if 61°C or below;
- any subsidiary hazards not stated in the proper shipping name;
- the control and emergency temperatures when applicable; and
- any other information required by the IMDG Code.

The shipowner or master must not accept any load for which this information is not provided.

58 The shipper also needs to ensure that the CTU is properly placarded, marked and signed. In practice, the shipper's representative may not be present at the place where the CTU is packed, and the placarding is carried out instead by the packer (paragraphs 42 to 44). Liaison between the packer and the shipper is crucial to ensure that the appropriate warning placards etc are fixed to the CTU before it starts its journey from the packer's premises.

The freight forwarder

59 Freight forwarders may fulfil a number of different roles in the transport chain. They usually act as agents on behalf of the goods' owners and, as such, handle and forward the documentation. If they do this, they must ensure that it is correct. Freight forwarders may also act as hauliers or packers. If goods are brought together from different sources before packing for onward transmission as a unit load, the freight forwarder may also be a consolidator.

60 If freight forwarders act as packers, shippers or hauliers, they must take on the relevant health and safety duties. The advice contained elsewhere in this guidance applies to them in respect of these duties.

The haulier

61 While not generally involved in the packing of the CTU, the haulier is a vital link in the transport chain between the packer and the port. Typically, the haulier will be a domestic or international transport operator, but may also be a rail freight operator, consolidator or shipping company. If hauliers also own or lease out containers, they must ensure they are properly maintained.

Notice of entry to a port

62 In accordance with regulation 6 of DSHAR, the haulier must ensure that advance notice of the arrival of dangerous goods at a port from inland is always given to the harbour master (and the berth operator in all cases where the goods are to be brought to a berth). The normal requirement is for not less than 24 hours notice; when this is not reasonably practicable, a shorter period may be accepted, provided it has been agreed by both the harbour master and the berth operator.

63 The information should cover:

- the designation (proper shipping name) of the goods;
- the UN number;
- the quantity or gross mass of the goods (net mass in the case of explosives);
- the classification of the goods; and
- any other information required by the harbour master.

This information is the same as some of the information which the shipper has to ensure is given to the haulier and the ship's operator or master.

Road transport

64 Freight and tank containers placarded in accordance with IMDG requirements do not have to display any further information. However, the vehicles carrying them from inland premises to a port still have to display reflective rectangular orange plates as required by CDGRoad and CER2, and the journeys are subject to all the other operational provisions of these Regulations.

65 The vehicle operator must ensure that the vehicle satisfies the relevant requirements of CDGRoad and CER2, and that the driver is trained in accordance with the Carriage of Dangerous Goods by Road (Driver Training) Regulations 1996 (DTR2).²⁶ The driver has duties in addition to those placed on the operator. In some cases, the driver will be a self-employed owner-operator, and will need to comply with the requirements on both operators and drivers.

66 If you are the operator of a road vehicle (eg a freight transport company) you must ensure that:

- vehicles are suitable for the operation;
- vehicles display the appropriate hazard warning panels etc;
- the drivers are provided with the transport information which the shipper has to provide to the haulier, plus enough information about the dangerous goods to know the nature of the hazards and the action to be taken in an emergency (all this needs to be in writing);
- there is a place in the cab for drivers to keep the detailed information;
- drivers are adequately trained and instructed in the hazards of the load, any emergency action which they may need to take, and their duties under the law;
- if required by the Driver Training Regulations, drivers have a certificate of driver training valid for the goods and type of carriage;
- vehicles are provided with appropriate fire extinguishers;
- vehicles are provided with any other safety equipment which the drivers need to take the action required of them in the emergency information (such equipment might include first-aid equipment and protective clothing);
- drivers have been trained to use that emergency equipment;
- any CTU that is a freight container has a valid safety approval plate; and
- although the packer has the primary duty to inform the haulier if particular substances should be segregated from others, this information is checked to ensure that incompatible substances are not carried in containers on the same vehicle.

Further guidance is given in *Carriage of dangerous goods explained: Part 2: Guidance for road vehicle operators and others involved in the carriage of dangerous goods by road*.²³

67 Your drivers must:

- ensure that information about previous loads or other substances not being carried has been destroyed, removed or kept in a securely closed container;
- keep the written information they have been given about the dangerous goods available throughout the journey;
- contact you before accepting any load about which there is inadequate information;
- take precautions against fire, explosion or any other incident throughout the carriage - this includes checking the fire extinguishers, normally every day;
- ensure appropriate hazard warning placards are displayed free from damage or dirt etc;
- ensure loads are properly secured on the vehicle (Department of Transport Code of Practice *Safety of loads on vehicles*²⁷ provides guidance);
- check that any CTU that is a freight container has a valid safety approval plate; and
- only leave vehicles unattended in a harbour or harbour area if they are in a designated parking area.

68 The text for a drivers' pocket card is at Appendix 8.

References

- 1 *Carriage of dangerous goods explained: Part 1 Guidance for consignors of dangerous goods by road and rail (classification, packaging, labelling and provision of information)* HSG160 HSE Books 1996 ISBN 0 7176 1255 4
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- 3 *Approved Vehicle Requirements. Carriage of Dangerous Goods by Road Regulations 1996* Approved Requirements L89 HSE Books 1996 ISBN 0 7176 1222 8
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- 16 *Stowage of goods in freight containers* BS 5073: 1982 BSI 1982
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Classification and Labelling of Explosives Regulations 1983 (SI 1983/1140)
ISBN 0 11 037140 2

Freight Containers (Safety Convention) Regulations 1984 (SI 1984/1890)
ISBN 0 11 047890 8

Ionising Radiations Regulations 1985 (SI 1985/1333) ISBN 0 11 057333 1

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ISBN 0 11 015197 X

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(SR 1991/509) as amended ISBN 0 337 10509 1

The Management of Health and Safety at Work Regulations 1992 (SI 1992/2051)
ISBN 0 11 025051 6

Control of Substances Hazardous to Health Regulations 1994 (SI 1994/3246)
ISBN 0 11 043721 7

The Explosives in Harbour Areas Regulations (Northern Ireland) 1995 (SR 1995/87)
ISBN 0 377 92336 1

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*The Carriage of Dangerous Goods (Classification Packaging and Labelling) and Use
of Transportable Pressure Receptacles Regulations 1996* (SI 1996/2092)
ISBN 0 11 062923 X

Carriage of Explosives by Road Regulations 1996 (SI 1996/2093)
ISBN 0 11 062925 6

Carriage of Dangerous Goods by Road (Driver Training) Regulations 1996
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The Carriage of Dangerous Goods by Road Regulations 1996 (SI 1996/2095)
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Merchant Shipping (Carriage of Cargoes) Regulations 1997 (SI 1997/19)
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Confined Spaces Regulations 1997 (SI 1997/1713) ISBN 0 11 064643 6

Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997
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Merchant shipping notices and marine guidance notes

MCA *The Carriage of Dangerous Goods in Ships* Merchant Shipping Notice M1620

MCA *Portable tanks, road tank vehicles and rail tank wagons for the carriage by sea of liquid dangerous goods and liquefied gases* Merchant Shipping Notice MSN1705

MCA *The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997* Marine Guidance Note MGN37

MCA *The Carriage of Military and Commercial Explosives* Merchant Shipping Notice MSN1706

Further reading

Guidelines for shipping packaged dangerous goods by sea
Chemical Industries Association 1997 ISBN 1 85897 062 8.
Available from the CIA, Kings Buildings, Smith Square, London SW1P 3JJ.

The future availability and accuracy of the references listed in this publication cannot be guaranteed.

How to obtain publications

HSE publications are available from HSE Books, PO Box 1999, Sudbury, Suffolk
Tel: 01787 881165, Fax: 01787 313995.

British Standards are available from BSI Sales and Customer Services, 389
Chiswick High Road, London W4 4AL Tel: 0181 996 7000 Fax: 0181 996 7001.

The Stationery Office (formerly HMSO) publications, including all the statutory instruments, are available from The Publications Centre, PO Box 276,
London SW8 5DT Tel: 0171 873 9090. They are also available from bookshops.

DTP and Maritime and Coastguard Agency publications, other than merchant shipping notices, are available from the Stationery Office.

Merchant shipping notices and marine guidance notes are available from Eros Marketing and Support Services, Unit B, Imber Court Trading Estate, Orchard Lane, East Molesley, Surrey, KT8 0BN Tel: 0181 957 5028, Fax: 0181 957 5012.

IMO publications are available from the International Maritime Organisation, 4 Albert Embankment, London SE1 7SR Tel: 0171 735 7611, Fax: 0171 587 3241.

The SITPRO Dangerous Goods Note may be printed under licence from SITPRO, 151 Buckingham Palace Road, London SW1W 9SS.

Appendix 1

Definitions for the purpose of this guidance

Bulk packaging - *A CTU loaded with solid substances without any intermediate form of containment.*

Cargo transport unit (CTU) - *A road freight vehicle, railway freight wagon, freight container, or portable tank (tank container) used for the carriage of goods. This definition differs slightly from the definition at Section 7.4.1 of the General Introduction to the IMDG Code by excluding road tank vehicles and railway tank wagons.*

Haulier - *A person or company who moves goods from one place to another by road or rail. In the case of road transport, the definition includes both the operator and the driver of the vehicle, who have day to day control. Examples would include domestic and international transport operators, rail companies, freight forwarders and consolidators.*

Competent authority - *This is the national body which is responsible for the requirement concerned. MCA is the competent authority in the UK for the carriage of dangerous goods by sea. For carriage by road or rail the UK competent authority is normally the Department of the Environment, Transport and the Regions.*

Consignor - see under **Shipper**

Container packing certificate - *A document provided by those responsible for packing the goods certifying that the packing of dangerous goods into a container has been properly carried out. This definition is consistent with Section 12.3.7 of the General Introduction of the IMDG Code.*

Dangerous goods - *This includes any dangerous goods within the scope of the IMDG Code definitions of Classes 1 to 9, as dangerous for carriage by sea. This includes marine pollutants which are not otherwise dangerous.*

Dangerous goods declaration - *A written declaration signed by the person making it that a shipment offered is properly classified, packaged, marked, labelled and placarded in accordance with the IMDG Code and is in a proper condition for carriage. This definition is consistent with Section 9.4 of the General Introduction of the IMDG Code.*

Freight forwarder - *Any person or company involved in the movement of cargo who acts on behalf of somebody else. The freight forwarder may not be the owner of the goods, but may be involved in packing and carriage or act as a consolidator or agent. Some or all of these activities may also be subcontracted. This description is consistent with the normal use of the term in the shipping industry. The term 'forwarder' is defined differently in the Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997.*

Marine pollutants declaration - This is equivalent to the **Dangerous goods declaration** but is for marine pollutants which are not otherwise dangerous for carriage.

Packer - Any person or company who loads packages containing dangerous goods into a CTU. This definition includes packing carried out at the premises of a shipper's, manufacturer's, forwarding agent's, consolidator's or independent packing company's premises. The definition does not include the initial packing of dangerous goods into export packaging, since this is usually carried out at the point of manufacture and may not necessarily be destined for a maritime journey. Sometimes, however, such packing will be carried out under instruction from the shipper.

Shipper - (sometimes called the **consignor**) - A person or company acting either alone or on behalf of somebody else, who consigns dangerous goods for shipment by sea. The shipper instigates the movement and instructs the haulier to transport the goods. Manufacture and packing of dangerous goods may also take place at the shipper's own premises.

Vehicle declaration - A document provided by those responsible for packing a vehicle certifying that the packing of dangerous goods has been properly carried out. This is similar in content to a container packing certificate (see Section 17.7.7 of the General Introduction to the IMDG Code).

Appendix 2

CTUs which have been refrigerated using solid carbon dioxide or fumigated

- 1 Fumigants are sometimes used in CTUs. Although such fumigants are not part of the loads, they are toxic or asphyxiant and exposure to them may create health risks. They may also be flammable. Because of this, a CTU which is offered for shipment by sea when under fumigation must be shipped as a 'CTU under fumigation' and comply with the IMDG Code's requirements for Class 9 dangerous goods (miscellaneous dangerous goods). It needs to display the IMDG fumigation warning sign with the name of the fumigant and the date it was applied.
- 2 The carbon dioxide given off by dry ice used to cool CTUs is also asphyxiant and gives rise to similar risks. IMDG requires such containers to be conspicuously marked with the words 'Dangerous CO₂ gas (dry ice) inside. Ventilate thoroughly before entering'.
- 3 Under the Control of Substances Hazardous to Health Regulations 1994¹⁸ (COSHH) and the Management of Health and Safety at Work Regulations 1992¹⁹ (the Management Regulations), employers must take steps to ensure that risks from fumigation and dry ice are properly controlled, and that their employees receive appropriate information, instruction and training and are adequately supervised. The Confined Spaces Regulations²⁸ apply to any entry into containers which may still contain fumigants or raised levels of carbon dioxide and the HSE guidance on fumigation^{29,30} and the IMO *Recommendations on the safe use of pesticides in ships*³¹ provide advice on the precautions when carrying out fumigation. The IMO Recommendations are included as Section 6 of the Supplement to the IMDG Code.

Appendix 3

United Nations recommendations for the training of persons engaged in the transport of dangerous goods (paragraph 21)

Persons engaged in the transport of dangerous goods shall receive training in the contents of dangerous goods requirements commensurate with their responsibilities.

Individuals such as those who classify dangerous goods; pack dangerous goods; offer or accept dangerous goods for transport; carry or handle dangerous goods in transport; mark or placard or load or unload packages into or from transport vehicles, bulk packagings or freight containers; or are otherwise directly involved in the transport of dangerous goods as determined by the competent authority; shall receive the following training:

(a) **General awareness/familiarisation training:**

- (i) each person shall receive training designed to provide familiarity with the general provisions of dangerous goods transport requirements.
- (ii) such training shall include a description of the classes of dangerous goods; labelling, marking, placarding and packaging; segregation and compatibility requirements; a description of the purpose and content of the transport document; and a description of available emergency response documents.

(b) **Function-specific training.** Each person shall receive detailed training concerning specific dangerous goods transport requirements which are applicable to the function that person performs.

(c) **Safety training.** Commensurate with the risk of exposure in the event of a release and the functions performed, each person shall receive training on:

- (i) methods and procedures for accident avoidance such as the proper use of package-handling equipment and appropriate methods of stowage of dangerous goods;
- (ii) available emergency response information and how to get it;
- (iii) general dangers presented by the various classes of dangerous goods and how to prevent exposure to these hazards, including, if appropriate, the use of personal protective clothing and equipment; and
- (iv) immediate procedures to be followed in the event of an unintentional release of dangerous goods, including any emergency response procedures for which the person is responsible and personal protection procedures to be followed.

The training required by the above shall be provided or verified upon employment in a position involving dangerous goods transport and shall be periodically supplemented with retraining as deemed appropriate by the competent authority.

Appendix 4

Summary of legal responsibilities

Action	Person responsible	Legal requirements
Dangerous goods to be properly packaged and labelled	manufacturer/ supplier/shipper	HSWA s 6, CDGCPL regs 6 and 8, PEC reg 4, CLER reg 3, MS(DG&MP) regs 11 and 15
Training and supervision of people carrying out packing	packer	HSWA s 2
Health and safety of people packing CTUs must not be put at risk	packer	COSHH, HSWA s 2, Management Regs, IRRs
Freight container properly constructed, maintained and plated	owner or lessee of container or any other person who uses or permits its use, eg packer, shipper or haulier	FC(SC) regs 4(1) and 4(2), HSWA ss 2 and 3
Visual inspection of container and packages	packer	HSWA ss 2 and 3
Container and vehicle loading - all packages securely stowed and braced	packer	HSWA ss 2 and 3, MS(DG&MP) reg 12, DSHAR reg 23

Action	Person responsible	Legal requirements
Provision of signed container/packing certificate/vehicle declaration	packer	DSHAR regulation 23, MS(DG&MP) reg 12
Vehicle suitable for operation	haulier	Road Traffic Legislation, CDGRoad reg 10, CER2 reg 10
CTU properly placarded	packer or shipper	DSHAR reg 25, CDGRoad reg 17, CER2 regulation 15, MS(DG&MP) reg 11 and 15
Vehicle properly placarded	haulier	CDGRoad reg 17, CER2 reg 15
Provision of signed dangerous goods declaration	shipper	MS(DG&MP) reg 10
Information on nature of hazards to haulier	shipper	CDGRoad regs 13 and 14 CER2 regs 16 and 17
Advance notification to port	haulier	DSHAR reg 6
Safety during transfer of dangerous goods by road	haulier/driver	CDGRoad regs 6-24 CER2 regulations 7-28 DTR2 regs 3-7, RAMRoad

Freight forwarders may have responsibilities for one or more of these matters depending on their role in the transport chain

Appendix 5

Checklist of legal duties

This appendix contains checklists of the main duties of the following categories of people:

- packers
- shippers
- freight forwarders
- hauliers
- vehicle drivers

Duties of the packer

- 1 Check that the packaging of the goods is correct and that any packages are in a satisfactory condition (HSWA sections 2 and 3).
- 2 In the case of a freight container, ensure that any container carries a valid safety approval plate (FC(SC) regulation 4).
- 3 Ensure the freight container is clean and in a good condition.
- 4 Ensure that risk assessments under COSHH and the Management Regulations cover the health and safety risks to packers, especially from spillage or leakage; that appropriate precautions are in place; and that people who pack CTUs are properly trained, instructed and supervised. Training in identification of hazards and safe loading practices is particularly important.
- 5 Ensure CTU is loaded in accordance with IMDG Code (MS(DG&MP) regulation 12).
- 6 Ensure CTU is properly placarded with relevant hazard warning placards, marks and signs (MS(DG&MP) regulations 11, 12 and 15).
- 7 On completion of packing, provide a completed, signed container/vehicle packing certificate to the person who will transport the CTU (DSHAR regulation 23, MS(DG&MP) regulation 12).

Duties of the shipper

- 1 If the owner or lessee of a freight container, ensure it is properly maintained (FC(SC) regulation 4).
- 2 Check packaging of goods is correct (MS(DG&MP) regulation 11).
- 3 Check packages are properly labelled and marked (MS(DG&MP) regulation 11).
- 4 Ensure CTU is properly placarded with relevant hazard warning placards, marks and signs (DSHAR regulation 25; MS(DG&MP) regulations 11 and 15).

- 5 Provide dangerous goods declaration for ship's operator or master (MS(DG&MP) regulations 10 and 11).
- 6 Provide haulier with written hazard warning information (CDGRoad regulation 13).

Duties of the freight forwarder

- 1 Depending upon the role in the transport chain, the freight forwarder may be a packer, shipper or haulier. The relevant duties under each of these headings apply as appropriate to each case.
- 2 The freight forwarder may also be responsible for the onward transfer of the dangerous goods documentation from shipper and packer to the ship's operator or master.

Duties of the haulier

- 1 Provide appropriate vehicle.
- 2 Ensure that the vehicle displays the required hazard warning panels and information (CDGRoad regulation 17 and CER2 regulation 15).
- 3 Ensure that the harbour master, and berth operator when appropriate, are notified in writing that a CTU will be bringing dangerous goods into the harbour of harbour area (DSHAR regulation 6).
- 4 Ensure drivers are properly trained in the safe transport of dangerous goods (DTR2).
- 5 If the owner or lessee of a freight container, ensure it is properly maintained and has a valid safety approval plate (FC(SC) regulations 4 and 5).
- 6 If not the owner of a freight container, ensure that it is checked to confirm that it has a valid safety approval plate (FC(SC) regulation 4).
- 7 Provide driver with written information as to the nature of the hazards from the goods being carried (CDGRoad regulation 14 and CER2 regulation 17).
- 8 Ensure fire-fighting equipment is provided and maintained on the vehicle (CDGRoad regulation 23 and CER2 regulation 25).

Duties of the vehicle driver

- 1 Keep hazard warning information readily available and ensure that any information about previous loads is in a closed container (CDGRoad Regulation 15 and CER2 regulation 18).
- 2 Take precautions against fire and explosion during carriage (CDGRoad regulation 23 and CER2 regulation 25).
- 3 Ensure that the hazard warning panels etc are kept clean and free from obstruction (CDGRoad regulation 17 and CER2 regulation 15).

- 4 Check that any freight container carried has a valid safety approval plate.
- 5 Do not leave vehicle unattended in a harbour or harbour area unless it is in a designated parking area (DSHAR regulation 32, CDGRoad regulation 24 and CER2 regulation 21).

Appendix 6

Examples of IMDG placards, marks and signs

Labels of class 1

For goods of class 1 in division 1.4, compatibility group S, each package may alternatively be marked **1.4S**

Subsidiary risk label of class 1 for self-reactive and related substances in class 4.1 and organic peroxides (class 5.2) with explosive properties

The appropriate division number and compatibility group are to be placed in this location for divisions 1.1, 1.2 and 1.3, eg **1.1 D**

The appropriate compatibility group is to be placed in this location, eg **D**

The appropriate compatibility group is to be placed in this location, eg **N**

Labels of class 2

Class 2.1 **Class 2.2** **Class 2.3**

Label of class 3

Labels of class 4

Class 4.1 **Class 4.2** **Class 4.3**

Labels of class

5



Class 5.1 Class 5.2

Labels of class

6



Class 6.1 Class 6.2

Labels of class

7



Category I Category II Category III

Labels of class



Labels of class

9



Sample display of UN number on a CTU

Alternative 1



Alternative 2



* Location of class number

** Location of UN number

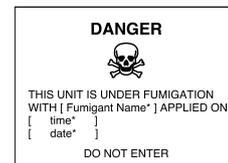
MARINE POLLUTANT
Mark



ELEVATED TEMPERATURE
Mark



FUMIGATION WARNING
Sign



* Insert details as appropriate

Subsidiary risk labels and placards

Subsidiary risk labels and placards are as shown here, but they should not bear the class number in the bottom corner.

For example:



Appendix 7

Text for a packers' pocket card

Do's

Do check the condition of individual packages for damage, leaking, staining etc.

Do check that packages show:

- proper shipping name;
- UN number;
- Class label;
- subsidiary risk label (if appropriate);
- marine pollutant mark (if relevant); and
- UN type approval mark.

Do confirm the nature of hazards from the package labels.

Do visually check the condition of the CTU before loading.

Do check that the safety approval plate of any freight container is valid.

Do remove irrelevant placards and markings from the outside of the CTU.

Do follow a loading plan drawn up by a responsible person when packing the CTU.

Do ensure packages are properly secured and effectively braced inside the CTU.

Do securely close and seal the CTU when loading is complete.

Do ensure the container packing certificate/vehicle declaration is signed and forwarded to the ship's operator or master (this is not required for road tank vehicles or tank containers).

Do ensure sides and ends of the CTU are placarded in accordance with the IMDG Code.

Do ensure written information on potential hazards is passed from the shipper to the forwarder/haulier.

Dont's

Don't handle damaged, leaking or stained packages - seek expert advice.

Don't load a freight container without a valid safety approval plate.

Don't load any packages of dangerous goods which are not properly labelled and marked.

Don't load packages into a CTU which are wet, damaged or unclean.

Don't place packages in a CTU with incorrect placards etc still visible on the outside.

Don't attempt to load packages without a loading plan to ensure different dangerous goods are properly segregated.

Don't leave cargo in a CTU which is not effectively secure to withstand the normal stresses of handling and carriage by sea.

Don't exceed the maximum gross mass of the CTU marked on the safety approval plate.

This checklist may be freely reproduced and is available as a pocket card from the Maritime and Coastguard Agency, MSASD, Spring Place, 105 Commercial Rd, Southampton SO15 1EG.

Appendix 8

Text for a drivers' pocket card

Do's

Do check that the dangerous goods declaration provided by the shipper clearly identifies what goods are being carried and in what quantities.

Do obtain the container packing certificate/vehicle declaration* from the packer certifying that dangerous goods have been safely packed. *Note: the information required for the dangerous goods and container/vehicle declarations may appear on the same document, but will need two separate signatures.*

Do obtain and carry the transport documentation including the TREMCARD or other information which identifies the dangerous goods, the nature of the hazard and emergency procedures. *Note: Some of this may be provided as part of the dangerous goods declaration and packing certificate.*

Do check that any freight container has a valid safety approval plate.

Do visually check the outside of the CTU for signs of possible damage or leakage.

Do ensure the CTU doors are properly secured.

Do familiarise yourself with emergency procedures.

Do ensure that any specific first-aid or protective equipment specified in the transport documentation for the driver is readily available on the vehicle.

Do ensure that a suitable fire extinguisher is available for use.

Do check that the sides and ends of the CTU are properly placarded etc. Irrelevant placards, signs and marks must be removed. Placards etc must be secure, durable and unobstructed.

Do ensure that all irrelevant hazard information is removed from the vehicle or is kept in a securely closed container clearly marked to indicate that it does not relate to the load being carried.

* Not required for road tank vehicles or tank containers.

Do ensure precautions against fire and explosion are taken throughout the journey.

Do take care when parking the vehicle to avoid creating a risk to the health and safety of people in the area or living nearby.

Don'ts

Don't accept a load without appropriate written hazard information from the shipper or start a journey without appropriate written hazard information.

Don't accept a freight container without a valid safety approval plate.

Don't allow a CTU to travel with irrelevant hazard placards, marks or signs or lacking any form of hazard warning information.

Don't allow warning placards etc to become damaged or obscured.

Don't carry irrelevant hazard warning information loose in the vehicle cab.

Don't begin a journey without first checking that any necessary safety equipment is available and maintained ready for use (eg goggles, eyewash bottle, gloves).

Don't smoke or introduce any other sources of ignition, eg cooking equipment, when flammable or explosive substances are being carried.

Don't carry any unauthorised passengers.

This checklist may be freely reproduced and is available as a pocket card from the Maritime and Coastguard Agency, MSASD, Spring Place, 105 Commercial Rd, Southampton S015 1EG.

Further information

HSE priced and free publications can be viewed online or ordered from www.hse.gov.uk or contact HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995. HSE priced publications are also available from bookshops.

For information about health and safety ring HSE's Infoline Tel: 0845 345 0055 Fax: 0845 408 9566 Textphone: 0845 408 9577 e-mail: hse.infoline@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

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