Unit 15

CARGOES & IMDG CODE

Basic terms

unloading/discharging carriage	***loading***
bulk cargo	***method of packing method of***
general cargo	***transit***
fragility	***cargo damage pilferage***
tainting	***stowage factor***
sweating	***hale***
drum	***bag***
keg	***carton***
cask	***crate***
leakage	***carboy***
stowage of cargo handling	***glass container***
barrel	***box***
hogshead	***case***

The overall responsibility for the stowage of cargo rests with the **Master**.

In practice, whilst the Master retains overall responsibility, the supervision of stowage of cargo normally is delegated to the **Chief Officer**. His task is to see that neither the ship nor her cargo is damaged.

Furthermore, he is responsible for the safe handling, loading, stowage and carriage, including the custody of the cargo throughout the voyage.

Above all, he must ensure that the **safety of the ship** is not imperilled by the carriage of goods. His aim must be to have the cargo evenly distributed throughout the ship, to ensure her general stability. In practice, it is usual for the ship to be loaded a little deeper art, to improve the vessel's movement through the water.

This is called *"trimmed by the stem"*, the term "trim" referring to the difference in draught between the stem and stern.

A ship with a centre of gravity too low will be **stiff** and consequently apt to strain heavily in rough weather. Conversely, a ship with a centre of gravity too high will be **tender** and inclined to roll, thereby creating an unstable vessel.

Basically, there are two types of cargo: bulk and general cargo.

Bulk cargoes present little difficulty in stowage, as they tend to be conveyed in specia1ized vessels between two ports and are usually loaded and discharged by mechanical means. Cargoes such as grain, coal, copra and similar cargoes, are usually carried in bulk, and most he adequately ventilated during the voyage, as they are liable to spontaneous combustion.

With **general cargo,** or **breakbulk cargo,** the problem is more difficult, and calls for much greater skill. Such cargoes are conveyed generally in cargo liners, provided with numerous decks, including "tween decks". The position is made more difficult not only by the variety of cargoes conveyed, each with its own characteristics such as fragility, tainting, sweating, etc., but also by the wide variety of ports served by the cargo liner. Thus, cargo for later or "deep" ports on the voyage bas to he loaded first, and that for earlier ports loaded last. This causes many problems to the stevedore who is responsible to the Master for the discharging and loading.

Container terminals are built and are equipped on the quay face with giant portainer cranes capable of lifting containers in and off the container vessels. A feature of the cranes is the spreader which automatically connects with the top comer castings of each of two containers to lift them. Gantry cranes of 45 tonnes capacity are used to handle the container stack.

UN Recommendation 21

Cargo: The load of goods carried on board a ship or on another means of transport;

> *Cargo can consist of either liquid or solid materials or substances, without any packaging (e.g. bulk cargo), or of loose items of unpacked goods, packages, unutilized goods (on pallets or in freight containers) or goods loaded on transport units and carried on active means of transport*.

Cargo type: A classification of cargo carried, or intended to be carried, on means of transport, based on its general appearance.

Package: The complete product of a packaging operation, as prepared for transport and consisting of the packaging (receptacle, container) and its contained goods;

Packaging: Materials and components used in any packaging operation to wrap, contain and protect articles or substances during transport;

Package type: The shape or configuration of a package as it appears for transport.

(http://www.unece.org/cefact/recommendations/rec21/rec21rev1_ecetrd195e.pdf):

Types of Packaging

The method of packaging (or packing) depends primarily on the nature of the goods themselves and the method of transit for the anticipated voyage. Packing is not only designed as a form of protection to reduce the risk of the goods being damaged in transit, but also to prevent pilferage. There are numerous types of packing.

Many goods have little or no form of packing whatsoever, and are carried **loose**. These include iron and steel plates, iron rods, railway sleepers and steel rails. Such cargoes are generally weight cargoes, with a low stowage factor. Heavy vehicles, locomotives and buses are also carried loose, because of the impracticability and high cost of packing.

Bales are a form of packing consisting of a canvas cover often cross-looped by metal or rope binding. It is most suitable for paper, wool, cotton, carpets and rope.

Bags made of jute, cotton, plastic or paper, are a cheap form of container. They are suitable for cement, coffee, fertilizers, flour and oil cakes. Their main disadvantage is that they are subject to damage by water, sweat, books or, in the case of paper bags, breakage.

Cartons are a very common form of packing, and may be constructed of cardboard, strawboard or fibreboard. This form of packing is very much on the increase, as it is easily handled particularly by palletization. The principal disadvantage is its liability to crushing and pilfering.

Crates are a form of container half-way between a bale and a case. They are of wooden construction. Lightweight goods of larger cubic capacity, such as light machinery, domestic appliances like refrigerators, cycles, and certain foodstuffs, for instance oranges, are suitable for this form of packing.

Carboys, or **glass containers**, enclosed in metal baskets have a limited use, and are primarily employed for the carriage of acids and other dangerous liquids transported in small quantities.

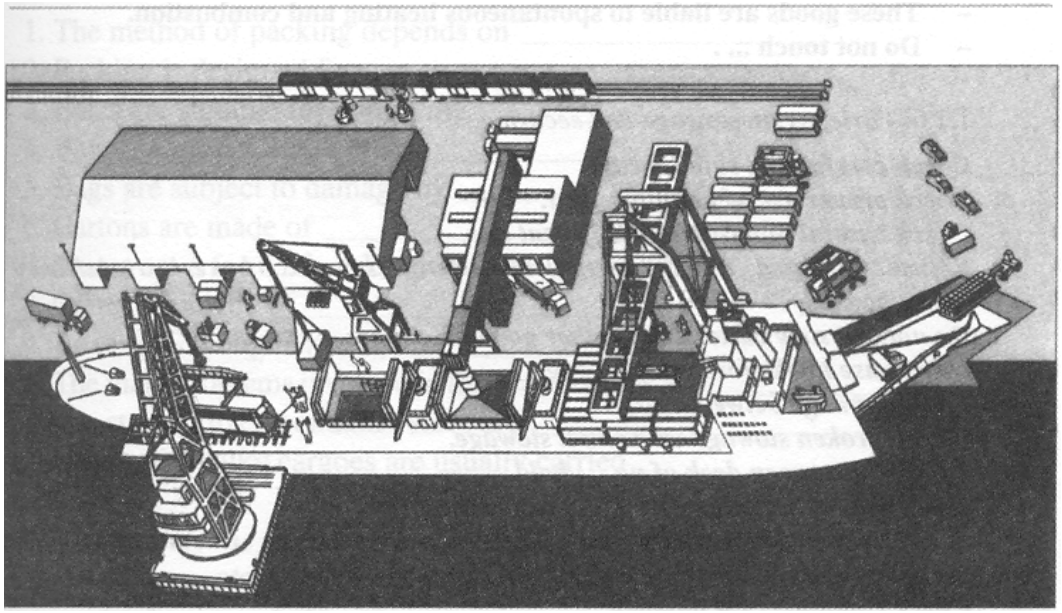
Boxes, cases and metal-lined cases are also used extensively. They are made of wood, vary in size and capacity, and may be

strengthened by the provision of battens and metal binding. Many of them, such as tea chests, are lined to create airtight packing, so as to overcome the difficulties that arise when passing through zone s of variable temperature. A lot of machinery and other items of expensive equipment, including cars and parts, are packed in this form.

Barrels, hogsheads and **drums** are used for the conveyance of liquid or greasy cargoes. The main problem associated with this form of packing is the likelihood of leakage if the unit is not properly sealed, and the possibility of the drums becoming rusty during transit. Acids can also be carried in plastic drums and bottles.

Pallets and **containers** of standardized form are the most recent types of packing.

Anyport



IMO STANDARD MARINE COMMUNICATION PHRASES (SMCP)

IV-C/I.2 - *HANDLING DANGEROUS GOODS* *(also see IMO-IMDG Code,* 1994)

1.2.1 - *Briefing on nature of dangerous goods*

What is IMO-Class of these goods?

- **IMO-Class of these goods: ... .**
- **This package contains IMO-Class ... goods.**
- **These goods / liquids / substances are flammable / oxidizing / poisonous - handle with caution.**
- **These goods emit flammable gases in contact with water-keep dry.**
- **These goods are liable to spontaneous heating and combustion.**
- **Do not touch ... .**

1.1.6. - *Briefing on stowage and securing.*

Check careful and safe stowage.

Check pro per use of handling gear.

Check careful separation of different lots.

Refuse damaged (crushed/renailed/wet/torn/resewn ... boxes/cartons/cases/ crates/bags/...) .

Do not overstow cartons with other goods ... .

Do not use books for handling bags.

Place dunnage between tiers.

Fill up broken stowage with small stowage.

Stow ... into tween deck of no. ... hold.

Stow ... in reefer hold.

Stow empty containers in topmost tiers.

Stow container(s) onto hatch cover(s).

Check containers for damage.

Check correct fixing of rope clips.

Secure heavy lift(s) immediately.

Relash all lashings.

A. COMPREHENSION & VOCABULARY

A.1 Decide which of the statements below is true or false:

1. The Chief Officer is most the responsible for the stowage of cargo.
2. The Master and the Chief Officer are responsible for the safety of the ship and the cargo
3. Cargo for "deep" ports is loaded first.
4. The ship tends to roll when the centre of gravity is too low.
5. If the ship is stiff, she wll1 be subject to strain in heavy weather.
6. General cargo and bulk cargoes are handled by mechanica1 means.
7. Container cranes are fitted with a spreader as a lifting device
8. The sequence of ports of discharge is not a factor which affects the stowage of cargo.

A.2 Complete the following sentences:

1. The method of packing depends on _____ .
2. Packing is designed for _____.
3. Bales are suitable for conveying _____ .
4. Bags are most suitable for _____ .
5. Bags are subject to damage by _____ .
6. Cartons are made of _____ .
7. Crates are a form of packing used for _____ .
8. Crates are made of _____ .
9. Boxes are strengthened by _____ .
10. The main prob1ems invo1ved in the use of drums are _____ .
11. The standardized container sizes are _____ .
12. Heavy and bulky cargoes are usual1y carried _____ .

A.3 Complete the following text with the terms below:

• ports • stow • stowage

• seaworthy • shift

• pilferage • discharge • hold

Stowage of cargo

In the 1. _____ the first consideration must be given to safety. The cargo must be stowed so that the ship will be stable and 2. _____ . It must be secured in such a manner that it cannot 3. _____ if the vessel encounters bad weather.

Then care must be taken to 4. _____ it so that it is not damaged by other cargo or water which may find its way info the 5. _____ . Care must be taken to prevent it from 6. _____ or damage while it is being stowed.

Where cargo is shipped for several 7. _____ , arrange it so that you can conveniently 8. _____ it at each port of rotation and that none shall be overcarried.

A.4 Supply the right terms from the reading text:

• Chief Officer • stowage and carriage

• bulk cargoes • loading

• general cargoes • stowage

Types of cargo

The officer in charge of the loading, 1. _____, and safe discharging of the cargo is the 2. _____ . Cargo such as bags of flour, boxes of electric equipment, crates of citrus fruit, Pallets with oil drums, is known as 3._____ . On the other band, cargoes which are carried loose, such as cement, ores, coal, etc., are called 4. _____ .

The 5. _____ and unloading of cargo require much knowledge and skill. The 6. _____ of cargo on board is performed by stevedores.

B. GRAMMAR

B.1 Supply the right form of the verb* in *brackets and rearrange the sentence as required:

Bulk cargo

Bulk cargo *(divide)* 1. _____ into liquid and dry bulk cargo. Liquid cargo *(carry)* 2. _____ in tankers. Dry bulk cargo *(include)* 3._____ grain, ores, coal and sugar. It *(load)* 4. _____ automatically by buckets on a conveyor belt system or pneumatically. Dry bulk cargo *(unload)* 5. _____ by huge grabs fitted to gantry cranes or by suction tubes.

B.2 Complete the gaps* in *this paragraph with a suitable preposition:

General cargo

General cargo can be divided 1. _____ containerized, non-containerized and refrigerated cargo. Most problems arise 2. _____ the stowage 3. _____ non-containerized cargo, because each commodity bas a different type 4._____ packaging.

Goods may be packaged 5. _____ bags, bales, cases or steel drums. General cargo is loaded 6. _____ cranes and ship's derricks. Perishable cargoes such as fruit, meat and dairy produce are carried 7. _____ _ships 8. _____ refrigerated holds.

B3 Match the definition with the corresponding term

This form of packing is made of jute, cotton, plastic or paper, are a cheap form of container. They are suitable for cement, coffee, fertilizers, flour and oil cakes. Their main disadvantage is that they are subject to damage by water, sweat, books or, in the case of paper bags, breakage.	**Boxes, cases**
a form of packing consisting of a canvas cover often cross-looped by metal or rope binding. It is most suitable for paper, wool, cotton, carpets and rope.	**Crates**
Form of packing used for the conveyance of liquid or greasy cargoes. The main problem associated with this form of packing is the likelihood of leakage if the unit is not properly sealed, and the possibility of the them becoming rusty during transit.	**Carboys**, or **glass containers**,
This form o packing is made of wood. They vary in size and capacity, and may be strengthened by the provision of battens and metal binding. Many of them, such as tea chests, are lined to create airtight packing, so as to overcome the difficulties that arise when passing through zone s of variable temperature. A lot of machinery and other items of expensive equipment, including cars and parts, are packed in this form.	**Bags**
Form of containers enclosed in metal baskets, primarily employed for the carriage of acids and other dangerous liquids transported in small quantities.	**Barrels, hogsheads** and **drums**
a very common form of packing, and may be constructed of cardboard, strawboard or fibreboard. This form of packing is very much on the increase, as it is easily handled particularly by palletization. The principal disadvantage is its liability to crushing and pilfering.	**Pallets** and **containers**
a form of container half-way between a bale and a case. They are of wooden construction. Lightweight goods of larger cubic capacity, such as light machinery, domestic appliances like refrigerators, cycles, and certain foodstuffs, for instance oranges, are suitable for this form of packing.	**Bales**
Goods which have little or no form of packing whatsoever. These include iron and steel plates, iron rods, railway sleepers and steel rails. Such cargoes are generally weight cargoes, with a low stowage factor. Heavy vehicles, locomotives and buses are also carried in such a way, because of the impracticability and high cost	**loose**

of packing.	
Packings of standardized form, the most frequent types of packing today	**Cartons**

B.3 Consider the following phrases associated with damage to the cargo:

a) The cargo of steel ***is liable to*** damage by rust.
b) The cargo of steel ***is susceptible to*** rust.
c) The cargo of steel ***is subject to*** damage by rust.
d) The cargo of steel ***lends itself to*** damage by rust.
e) The cargo of steel ***will rust easily*** if it comes in contact with water.

Use the above underlined phrases wherever possible to transform the following sentences:

1. Cargoes in cartons are liable to crushing.
   Cargoes in cartons … …….. … crushing.
   Cargoes in cartons … …….. …. …….
   Cargoes in cartons … …….. . ……. .
   Cargoes in cartons … … … . …….. .

2. Butter is susceptible to tainting with coffee.
   …….
   …….
   …….
   …….
   …….
3. Coal is liable to shift in heavy weather.
   …….
   …….
   …….

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…….

4. Liability to tainting is a characteristic of a cargo of tea.

…….

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5. Furniture is liable to mechanical damage and chafing.

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…….

6. The cargoes of bananas is liable to slight changes in temperature.

…….

…….

…….

…….

…….

7. Coffee is susceptible to taint with tea.

…….

…….

…….

…….

…….

8. Steel plates will rust easily.

…….

……

……

……

……

Supplements

Cargoes

The Port of London handles over 50 million tonnes of a wide range of cargoes every year. These include:

- unitised consignments (principally containers and lorry trailers)
- sea-dredged and secondary aggregates
- forest products
- crude oil and petroleum products
- sugar
- vehicles and plant
- cereals
- animal feedstuffs
- edible oils and fats
- chemicals
- fertilisers
- cement
- steel and other metals
- containerised refuse

A cargo of JCB excavators at Tilbury

(click to enlarge image)

Annex I (UN recommendation)

BASIC NUMERIC, ONE-DIGIT CODE SYSTEM

(a) CARGO

Cargo Type code

0 No cargo unit (liquid bulk goods)

1 No cargo unit (solid bulk goods)

2 Large freight containers

3 Other freight containers

4 Palletized

5 Pre-slung

6 Mobile self-propelled units

7 Other mobile units

8 (Reserved)

9 Other cargo types

(b) PACKAGES

Package Type code*

0 Bulk

1 Loose, unpacked (excluding bulk)

2 Rigid, box-type, (prismatic)

3 Rigid, drum-type, (cylindrical)

4 Rigid, bulb-type, (spherical)

5 Rigid, other

6 Flexible, bag-type

7 (for future use)

8 (Reserved)

9 Other, or special packages

(c) PACKAGING MATERIALS

Packaging material code

0 None

1 Plastics

2 Paper and fibreboard

3 Wood

4 (For future use)

5 Metal

6 Glass, porcelain, ceramic, stoneware

7 Textile

8 (Reserved)

9 Unknown or not otherwise enumerated

From:

Recommendation 21

CODES FOR TYPES OF CARGO,

PACKAGES AND PACKAGING MATERIALS

WITH COMPLEMENTARY CODES FOR PACKAGE NAMES

(http://www.unece.org/cefact/recommendations/rec21/rec21rev1_ecetrd195e.pdf)

For CARGO DAMAGE visit:

www.skuld.com/upload/.../Publications/.../**Damage**%20to%20**cargo**.pdf

IMDG Code or International Maritime Dangerous Goods Code

(from Wikipedia)

IMDG Code or **International Maritime Dangerous Goods Code** is accepted as an international guideline to the safe transportation or shipment of dangerous goods or hazardous materials by water on vessel. IMDG Code is intended to protect crew members and to prevent marine pollution in the safe transportation of hazardous materials by vessel. It is recommended to governments for adoption or for use as the basis for national regulations.

The implementation of the Code is mandatory in conjunction with the obligations of the members of united nation government under the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). It is intended for use not only by the mariner but also by all those involved in industries and services connected with shipping. Contains advice on terminology, packaging, labeling, placarding, markings, stowage, segregation, handling, and emergency response.

The code is updated and maintained by the DSC Sub-Committee of the International Maritime Organization every 2 years.

Dangerous goods, also called **hazardous materials** or **HazMat**, are solids, liquids, or gases that can harm people, other living organisms, property, or the environment. They are often subject to chemical regulations. "HazMat teams" are personnel specially trained to handle dangerous goods. Dangerous goods include materials that are radioactive, flammable, explosive, corrosive, oxidizing, asphyxiating, biohazardous, toxic, pathogenic, or allergenic. Also included are physical conditions such as compressed gases and liquids or hot materials, including all goods containing such materials or chemicals, or may have other characteristics that render them hazardous in specific circumstances.

Dangerous goods are often indicated by diamond-shaped signage. The colours of each diamond in a way has reference to its hazard i.e.: Flammable = red because fire and heat are generally of red colour, Explosive = orange, because mixing red (flammable) with yellow (oxidising agent) creates orange. Non Flammable Non Toxic Gas = green, due to all compressed air vessels being this colour in France after World War II. France is where the diamond system of HazMat identification originated.

Mitigating the risks associated with hazardous materials may require the application of safety precautions during their transport, use, storage and disposal. Most countries regulate hazardous materials by law, and they are subject to several international treaties as well. Even so, different countries may use different class diamonds for the same product. For example, in Australia, Anhydrous Ammonia UN 1005 is classified as 2.3 (Toxic Gas) with sub risk 8 (Corrosive), where as in the U.S. it is only classified as 2.2 (Non Flammable Gas).

People who handle dangerous goods will often wear protective equipment, and metropolitan fire departments often have a response team specifically trained to

deal with accidents and spills. Persons who may come into contact with dangerous goods as part of their work are also often subject to monitoring or health surveillance to ensure that their exposure does not exceed occupational exposure limits.

Laws and regulations on the use and handling of hazardous materials may differ depending on the activity and status of the material. For example, one set of requirements may apply to their use in the workplace while a different set of requirements may apply to spill response, sale for consumer use, or transportation. Most countries regulate some aspect of hazardous materials.

The most widely applied regulatory scheme is that for the transportation of dangerous goods. The United Nations Economic and Social Council issues the *UN Recommendations on the Transport of Dangerous Goods*, which form the basis for most regional and national regulatory schemes. For instance, the International Civil Aviation Organization has developed regulations for air transport of hazardous materials that are based upon the UN Model but modified to accommodate unique aspects of air transport. Individual airline and governmental requirements are incorporated with this by the International Air Transport Association to produce the widely used IATA *Dangerous Goods Regulations* (DGR)[1]. Similarly, the International Maritime Organization has developed the International Maritime Dangerous Goods Code ("IMDG Code", part of the International Convention for the Safety of Life at Sea) for transportation on the high seas, and the Intergovernmental Organisation for International Carriage by Rail has developed the Regulations concerning the International Carriage of Dangerous Goods by Rail ("RID", part of the Convention concerning International Carriage by Rail). Many individual nations have also structured their dangerous goods transportation regulations to harmonize with the UN Model in organization as well as in specific requirements.

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is an internationally agreed upon system set to replace the various different classification and labeling standards used in different countries. GHS will use consistent criteria for classification and labeling on a global level.

Dangerous goods are divided into classes on the basis of the specific chemical characteristics producing the risk.

Note: The graphics and text in this article representing the dangerous goods safety marks are derived from the United Nations-based system of identifying dangerous goods. Not all countries use precisely the same graphics (label, placard and/or text information) in their national regulations. Some use graphic symbols, but without English wording or with similar wording in their national language. Refer to the Dangerous Goods Transportation Regulations of the country of interest.

IMDG Ex. 1 Insert the appropriate verb in the right palace in the sentences below

IMDG Code or International Maritime Dangerous Goods Code is as an international guideline to the safe transportation or shipment of dangerous goods or hazardous materials by water on vessel. IMDG Code is to protect crew members and to marine pollution in the safe transportation of hazardous materials by vessel. It is to governments for adoption or for use as the basis for national regulations. (*recommended, intended, accepted, prevent*)

IMDG Ex. 2 Supply the missing term:

The implementation of the Code is in conjunction with the obligations of the members of United Nation government under the International Convention for the of Life at Sea (SOLAS) and the International Convention for the Prevention of from Ships (MARPOL 73/78). It is intended for use not only by the but also by all those involved in industries and services connected with. It contains advice on terminology, packaging, labeling, placarding, markings, stowage, segregation, handling, and. (*emergency response, Safety, mandatory, shipping, mariner, Pollution*)

IMDG Ex. 3 Supply the missing term:

Dangerous goods, also called _____ **materials** or **HazMat**, are solids, _____, or gases that can harm people, other living organisms, property, or the _____. They are often subject to chemical regulations. "HazMat teams" are _____ specially trained to handle dangerous goods. Dangerous goods include materials that are radioactive, _____, explosive, corrosive, oxidizing, asphyxiating, biohazardous, toxic, pathogenic, or allergenic. Also included are _____ conditions such as compressed gases and liquids or hot materials, including all goods containing such materials or _____, or may have other characteristics that render them hazardous in specific _____.

IMDG Ex. 4 MCT

Dangerous ***cargo/goods/commodity*** are often indicated by diamond-shaped signage. The colours of each ***cube/sphere/diamond*** in a way has reference to its hazard i.e.: Flammable = ***violet/red/green*** because fire and heat are generally of this colour, Explosive = orange, because mixing red (flammable) with yellow (oxidising agent) ***extinguishes/extinguishes/creates*** orange. Non Flammable Non Toxic Gas = green, due to all compressed air ***vessels/ships/barges*** being this colour in France after World War II. France is where the diamond system of ***HazMat/AtoNavs/NavAids*** identification originated.

Increasing/Endangering/Mitigating the ***risks/insurance/claims*** associated with hazardous materials may require the application of safety precautions during their transport, use, storage and disposal. Most countries regulate hazardous materials by ***custom/rule/law***, and they are ***subject/object/concern*** to several international treaties as well. Even so, different countries may use different class diamonds for the same product.

IMDG Ex. 5 Match the sentences below (note that the sentences in the left column are shown in the correct order):

	People who handle dangerous goods will often wear protective equipment, and	subject to monitoring or health surveillance to ensure that their exposure does not exceed occupational exposure limits.
	Persons who may come into contact with dangerous goods as part of their work are also often	depending on the activity and status of the material.
	Laws and regulations on the use and handling of hazardous materials may differ	metropolitan fire departments often have a response team specifically trained to deal with accidents and spills.
	For example, one set of requirements may apply to their use in the workplace	some aspect of hazardous materials.
	Most countries regulate	while a different set of requirements may apply to spill response, sale for consumer use, or transportation.

IMDG Ex. 6 Put one question of the YES/NO type and one of the Question-Word (QW) type to each of the sentences below:

The most widely applied regulatory scheme is that for the transportation of dangerous goods.	(YES/NO)
	(QW)
The *UN Recommendations on the Transport of Dangerous Goods* forms the basis for most regional and national regulatory schemes.	
The International Civil Aviation Organization has modified UN Model to accommodate unique aspects of air transport.	

The IMDG Code is a part of the International Convention for the Safety of Life at Sea.	
Many individual nations have harmonized their transportation regulations with the UN Model in organization.	
The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is an internationally agreed upon system set to replace the various different classification and labeling standards used in different countries.	
GHS will use consistent criteria for classification and labeling on a global level.	
Dangerous goods are divided into classes on the basis of the specific chemical characteristics producing the risk.	

Classification and labeling summary tables

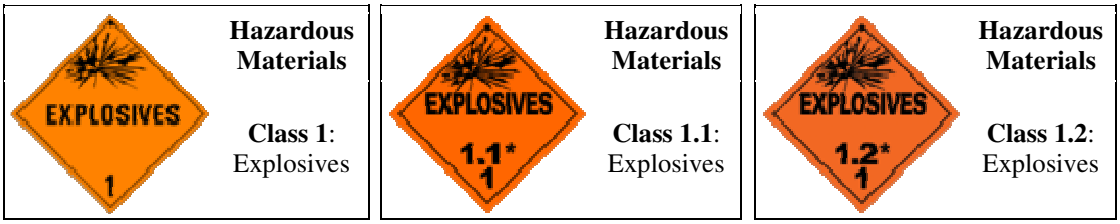
Class 1: Explosives

The Canadian Transportation of Dangerous Goods Regulations provides a description of compatibility groups:

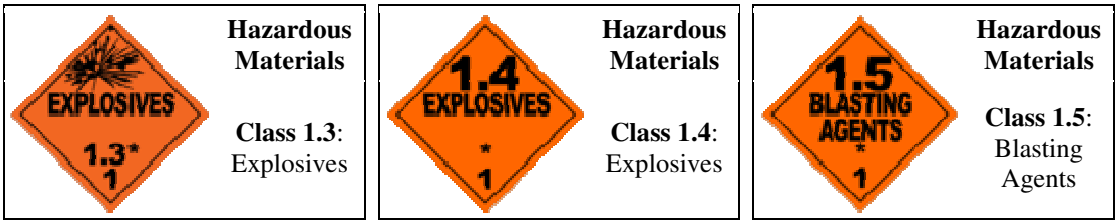
1.1 Explosives with a mass explosion hazard
Ex: TNT, dynamite, nitroglycerine.
1.2 Explosives with a severe projection hazard.
1.3 Explosives with a fire, blast or projection hazard but not a mass explosion hazard.
1.4 Minor fire or projection hazard (includes ammunition and most consumer fireworks).
1.5 An insensitive substance with a mass explosion hazard (explosion similar to 1.1)
1.6 Extremely insensitive articles.

The United States Department of Transportation (DOT) regulates hazmat transportation within the territory of the US:

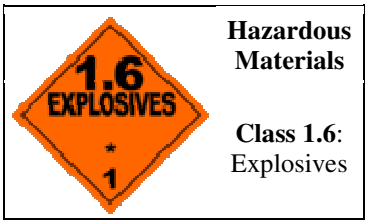
1.1 — Explosives with a mass explosion hazard. (nitroglycerin/dynamite)
1.2 — Explosives with a blast/projection hazard.
1.3 — Explosives with a minor blast hazard. (rocket propellant, display fireworks)
1.4 — Explosives with a major fire hazard. (consumer fireworks, ammunition)
1.5 — Blasting agents.
1.6 — Extremely insensitive explosives.



Mass Explosion Hazard | Blast/Projection Hazard



Minor Blast Hazard | Major Fire Hazard | Blasting Agents



Extremely Insensitive Explosives

IMDG Ex. 7 Supply the appropriate word qualifying the type of hazard: (minor, mass, blast, severe, extremely, mass)

The Canadian Transportation of Dangerous Goods Regulations provides a description of compatibility groups.

- 1.1 Explosives with a _____ explosion hazard
  - Ex: TNT, dynamite, nitroglycerine.
- 1.2 Explosives with a _____ projection hazard.
- 1.3 Explosives with a fire, _____ or projection hazard but not a mass explosion hazard.
- 1.4 _____fire or projection hazard (includes ammunition and most consumer fireworks).
- 1.5 An _____ substance with a mass explosion hazard (explosion similar to 1.1)
- 1.6 _____ insensitive articles.

IMDG Ex. 8 Look up the captions in the box above for the images below and supply the missing terms

1.1 — Explosives with a _____ hazard. (nitroglycerin/dynamite)
1.2 — Explosives with a _____ hazard.
1.3 — Explosives with a _____ hazard. (rocket propellant, display fireworks)
1.4 — Explosives with a _____hazard. (consumer fireworks, ammunition)
1.5 — _____ agents.
1.6 — _____ explosives.

IMDG Ex. 9 Look up the meaning of the words in an on-line a dictionary and match them with the adjectives describing gases below:

compressed,	a solid substance mixed into the liquid so that it becomes included in it
liquefied	reduced or squeezed in size by pressure
dissolved,	a substance that can kill you or make you ill if you eat, drink, or breathe it
poisonous,	a substance contains chemicals that can cause damage by rusting
corrosive	made or become liquid

IMDG Ex. 10 Check the pronunciation for the highlighted terms below, pronounce them using the transcripted form, and then write the word in the left column:

	/ə'setə,li:n/
	/'hʌɪdrədʒ(ə)n/
	'nʌɪtrədʒ(ə)n/
	'ni:ɒn/
	/'flʊəri:n, 'flɔriːn/
	/'klɔ:ri:n/
	/'sʌɪənʌɪd/
	,nʌɪtrə(ʊ)'glɪs(ə)ri:n,
	/'dʌɪnəmʌɪt/
	/'gasəli:n/
	/'asɪtəʊn/
	'hʌɪdrədʒ(ə)n 'sʌɪənʌɪd/
	/'kɛrəsi:n/
	/dʌɪ'sʌlfʌɪd/

Class 2: Gases

Gases which are compressed, liquefied or dissolved under pressure as detailed below. Some gases have subsidiary risk classes; poisonous or corrosive.

2.1 Flammable Gas: Gases which ignite on contact with an ignition source, such as acetylene and hydrogen /

2.2 Non-Flammable Gases: Gases which are neither flammable nor poisonous. Includes the cryogenic gases/liquids (temperatures of below -100°C) used for cryopreservation and rocket fuels, such as nitrogen and neon.

2.3 Poisonous Gases: Gases liable to cause death or serious injury to human health if inhaled; examples

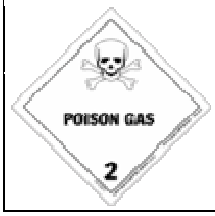
are fluorine, chlorine, and hydrogen cyanide.

Hazardous Materials

Class 2.1: Flammable Gas

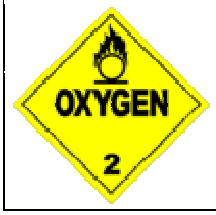
Hazardous Materials

Class 2.2: Nonflammable Gas



Hazardous Materials

Class 2.3: Poisonous Gas



Hazardous Materials

Class 2.2: Oxygen (Alternative Placard)

Hazardous Materials

Class 2.3: Inhalation Hazard (Alternative Placard)

IMDG Ex. 11 Supply the missing term

Flammable Gas: Gases which ignite on contact with an ignition source, such as acetylene and hydrogen /

2.1 _____ **Gases**: Gases which are neither flammable nor _____. Includes the cryogenic gases/liquids (temperatures of below -100°C) used for cryopreservation and rocket fuels, such as _____ and neon.

2.2 Poisonous Gases: Gases _____ to cause death or _____ injury to human health if _____; examples are fluorine, chlorine, and hydrogen cyanide.

IMDG Ex. 12 Supply the words in the captions

Hazardous Materials

Class 2.1:

_____

Gas

Hazardous Materials

Class 2.2:
Nonflammable

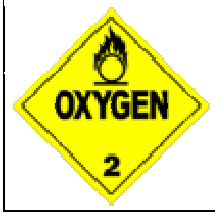
_____

Hazardous Materials

Class 2.3:

_____

Gas



Hazardous Materials

Class 2.2:

_____

(Alternative Placard)

Hazardous Materials

Class 2.3:
Inhalation

_____

(Alternative Placard)

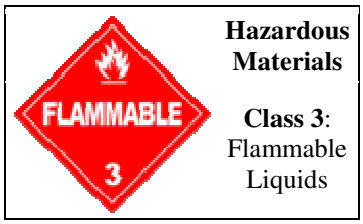
IMDG Ex 12 Check the pronunciation of the substances in Class 2

Class 3: Flammable Liquids

Flammable liquids included in Class 3 are included in one of the following packing groups:

- Packing Group I, if they have an initial boiling point of 35°C or less at an absolute pressure of 101.3 kPa and any flash point, such as diethyl ether or carbon disulfide;
- Packing Group II, if they have an initial boiling point greater than 35°C at an absolute pressure of 101.3 kPa and a flash point less than 23°C, such as gasoline (petrol) and acetone; or
- Packing Group III, if the criteria for inclusion in Packing Group I or II are not met, such as kerosene and diesel.

Note: For further details, check the Dangerous Goods Transportation Regulations of the country of interest.



Hazardous Materials

Class 3: Flammable Liquids

Hazardous Materials

Class 3: Combustible (Alternate Placard)

Hazardous Materials

Class 3: Fuel Oil (Alternate Placard)

Hazardous Materials

Class 3: Gasoline (Alternate Placard)

IMDG Ex. 13 Supply the missing term

Packing Group III, if the criteria for inclusion in Packing Group I or II are not met, such as kerosene and diesel.

Flammable liquids included in Class 3 are included in one of the following _____ groups:

- Packing Group I, if they have an initial _____ point of 35°C or less at an _____ pressure of 101.3 kPa and any _____ point, such as diethyl ether or carbon disulfide;
- Packing Group II, if they have an _____ boiling point greater than 35°C at an absolute pressure of 101.3 kPa and a _____ less than 23°C, such as gasoline (_____) and acetone; or

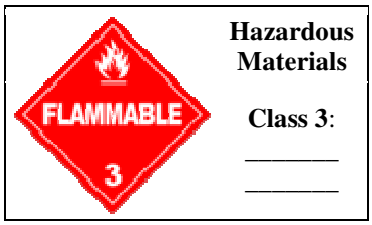
IMDG Ex. No. 14 Write down the captions for the boxes below:

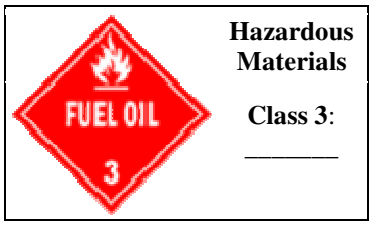
Class 3: Flammable Liquids

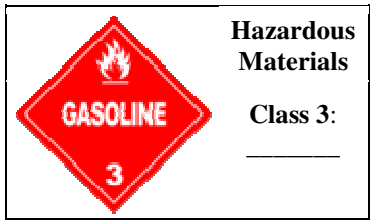
Flammable liquids included in Class 3 are included in one of the following packing groups:

- Packing Group I, if they have an initial boiling point of 35°C or less at an absolute pressure of 101.3 kPa and any flash point, such as diethyl ether or carbon disulfide;
- Packing Group II, if they have an initial boiling point greater than 35°C at an absolute pressure of 101.3 kPa and a flash point less than 23°C, such as gasoline (petrol) and acetone; or
- Packing Group III, if the criteria for inclusion in Packing Group I or II are not met, such as kerosene and diesel.

Note: For further details, check the Dangerous Goods Transportation Regulations of the country of interest.



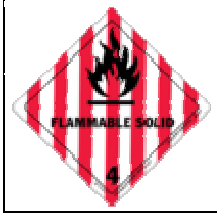




IMDG Ex. No. 15 Look up the following words in a monolingual English dictionary and find their definitions:

TERM	Definition	CROATIAN
boiling point		
flash point		
absolute pressure		

Class 4: Flammable Solids



Hazardous Materials

Class 4.1: Flammable Solids

Hazardous Materials

Class 4.2: Spontaneously Combustible Solids

Hazardous Materials

Class 4.3: Dangerous when Wet

4.1 **Flammable Solids**: Solid substances that are easily ignited and readily combustible (nitrocellulose, magnesium, safety or strike-anywhere matches).

4.2 **Spontaneously Combustible**: Solid substances that ignite spontaneously (aluminium alkyls, white phosphorus).

4.3 **Dangerous when Wet**: Solid substances that emit a flammable gas when wet or react violently with water (sodium, calcium, potassium, calcium carbide).

IMDG Ex. No. 16 Supply the missing terms

Hazardous Materials

Class 4.1: Flammable _____

Hazardous Materials

Class 4.2: Spontaneously Combustible _____

Hazardous Materials

Class 4.3: _____ when Wet

4.1 _____ **Solids**: Solid substances that are easily _____ and readily combustible (nitrocellulose, magnesium, safety or strike-anywhere matches).

4.2 **Spontaneously** _____: Solid _____ that ignite spontaneously (aluminium alkyls, white phosphorus).

4.3 **Dangerous when** ____: Solid substances that _____ a flammable gas when wet or _____ violently with water (sodium, /pə□tasɪəm/ , potassium, calcium carbide).

Class 5: Oxidizing Agents and Organic Peroxides

Hazardous Materials

Class 5.1: Oxidizing Agent

5.1 Oxidizing agents other than organic peroxides (calcium hypochlorite, ammonium nitrate, hydrogen peroxide, potassium permanganate).

Hazardous Materials

Class 5.2: Organic Peroxide Oxidizing Agent

5.2 Organic peroxides, either in liquid or solid form (benzoyl peroxides, cumene hydroperoxide).

IMDG Ex. No. 17 Class 4, 5, 6

Pronunciation	Spelling
ˌnʌɪtrəʊˈ**sɛ**ljʊləʊz,	
/mag'**ni:**zɪəm/	
'fɒsf(ə)rəs/	
/'**al**kʌɪl, -kɪl/	
'**səʊ**dɪəm/	
/pə'**ta**sɪəm/	
/'**kal**sɪəm/	
/'**kal**sɪəm **'kɑ:**bʌɪd/	
/pə'**rɒk**sʌɪd/	
'nʌɪtreɪt/	
/'**bɛn**zəʊʌɪl, -zəʊɪl/	
/'**pɛ**stɪsʌɪd/	
/'**klɔ:**rʌɪd/	

Class 6: Toxic and Infectious Substances

Hazardous Materials

Class 6.1: Poison

- 6.1a Toxic _____which are liable to cause death or serious _____ to human health if inhaled, swallowed or by skin absorption (potassium cyanide, mercuric chloride).
- 6.1b (Now PGIII) _____ substances which are harmful to human _____ (N.B this symbol is no longer authorized by the United Nations) (pesticides, methylene chloride).

Hazardous Materials

Class 6.2: _____

- 6.2 Biohazardous substances; the World Health Organization (WHO) divides this class into two categories: **Category A**: Infectious; and **Category B**: Samples (virus cultures, pathology specimens, used intravenous needles).

Class 7: Radioactive Substances

Hazardous Materials

Class 7: _____

Radioactive substances comprise substances or a combination of substances which emit ionizing radiation (uranium, plutonium).

Class 8: Corrosive Substances

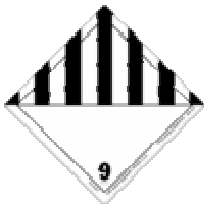
Hazardous Materials

Class 8: _____

Corrosive substances are substances that can dissolve organic tissue or severely corrode certain metals:

- **8.1 Acids**: sulfuric acid, hydrochloric acid
- **8.2 Alkalis**: potassium hydroxide, sodium hydroxide

Class 9: Miscellaneous



Hazardous Materials

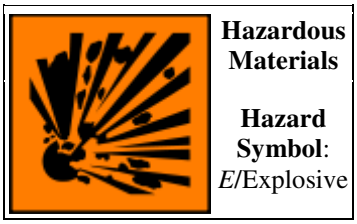
Class 9: Miscellaneous

Hazardous substances that do not fall into the other _____ (asbestos, air-bag inflators, self inflating life rafts, dry ice).

Other hazardous materials labels (CHIP)

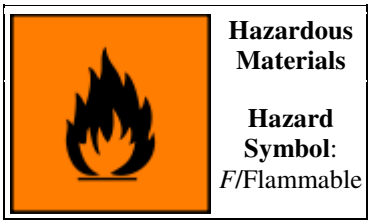
Hazardous Materials

Hazard Symbol: *C*/Corrosive



Hazardous Materials

Hazard Symbol: *E*/Explosive



Hazardous Materials

Hazard Symbol: *F*/Flammable

Hazardous Materials

Hazard Symbol: *N*/Environmental Hazard

Hazardous Materials

Hazard Symbol: *O*/Oxidizing

Hazardous Materials

Hazard Symbol: *T*/Toxic

Hazardous Materials

Hazard Symbol: *Xn*/Harmful; *Xi*/Irritant

Europe

The European Union has passed numerous directives and regulations to avoid the dissemination and restrict the usage of hazardous substances, important ones being the Restriction of Hazardous Substances Directive and the REACH regulation. There are also long-standing European treaties such as ADR and RID that regulate the transportation of hazardous materials by road, rail, river and inland waterways, following the guide of the UN Model Regulation.

European law distinguishes clearly between the law of dangerous goods and the law of hazardous materials. The first refers primarily to the transport of the respective goods including the interim storage, if caused by the transport. The latter describes the requirements of storage (including warehousing) and usage of hazardous materials. This distinction is important, because different directives and orders of European law are applied.

IMDG Ex. No. Supply the missing words:

The European Union has _____ numerous directives and regulations to _____ the dissemination and restrict the usage of hazardous _____, important ones being the Restriction of Hazardous Substances Directive and the REACH regulation. There are also long-standing European treaties such as ADR and RID that regulate the transportation of hazardous materials by road, rail, river and_____waterways, following the guide of the UN Model Regulation.
(avoid, passed, inland, substances)

IMDG Ex. No. Fit the missing words into the right place:

European law clearly between the law of dangerous goods and the law of hazardous materials. The primarily to the transport of the respective goods including the interim storage, if caused by the transport. The describes the requirements of (including warehousing) and usage of hazardous materials. This is important, because different directives and orders of European law are applied.
(distinction, distinguishes, latter, caused, refers, first, storage)

United Kingdom

The United Kingdom (and also Australia, Malaysia, and New Zealand) use the Hazchem warning plate system which carries information on how an emergency service should deal with an incident. The *Dangerous Goods Emergency Action Code List* (EAC) lists dangerous goods; it is reviewed every two years and is an essential compliance document for all emergency services, local government and for those who may control the planning for, and prevention of, emergencies involving dangerous goods. The latest 2009 version is available from the National Chemical Emergency Centre (NCEC) website[3] and as a book[4].

Transport documents

One of the transport regulations is that, as an assistance during emergency situations, written instructions how to deal in such need to be carried and easily accessible in the driver's cabin.

A license or permit card for hazmat training must be presented when requested by officials.

Dangerous goods shipments also require a special declaration form prepared by the shipper. Among the information that is generally required includes the shipper's name and address; the consignee's name and address; descriptions of each of the dangerous goods, along with their quantity, classification, and packaging; and emergency contact information. Common formats include the one issued by the International Air Transport Association (IATA) for air shipments and the form by the International Maritime Organization (IMO) for sea cargo.

Dangerous cargo documentation for container ship

DG cargo require special care after they are loaded on board ship. The containers carrying DG cargo need proper documentation. The article here is about procedures and guidelines on such cargo documents.

Documents relating to dangerous (DG) cargo on board are subject to scrutiny by port officials, PSC inspectors and other concerned parties. Thus any irregularities in such documentation may result in fines, detention or other such serious implications for the vessel.

Documentation related to the carriage of Dangerous Cargo on board container ships will mainly consist of the following:

1) The vessel must be in possession of a valid **Document of compliance** with special requirements for ships carrying dangerous goods. The appendix to this document will contain information indicating class wise allowable locations for stowage of dangerous goods on board.

2) Each dangerous cargo shipment shall be accompanied by a Dangerous Goods List or Manifest. This manifest shall be set out in accordance to the pertinent regulation of SOLAS and MARPOL conventions and the IMDG code. DG Manifests shall be filed on board and maintained load port wise.

3) Each dangerous cargo shipment shall also be accompanied by a Dangerous Goods Declaration.
This is a signed certificate or declaration that the consignment, as offered for carriage, is properly packaged, marked, labeled or placarded as appropriate and in proper condition for carriage.

This declaration may be combined with the container packing certificate as required by the pertinent regulation of SOLAS and MARPOL conventions and the IMDG code. DG Declarations shall be filed on board and maintained discharge port wise.

4) When dangerous goods are carried on board, appropriate information shall be immediately available at all times for use in emergency response to accidents and incidents involving dangerous goods in transport.
This information may be in the form of separate documents, safety data

sheets or the Emergency Response Procedures for Ships Carrying Dangerous Goods (EMS Guide) for use in conjunction with the transport document and the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG).

5) Where required for reporting to port authorities, the Chief Officer shall prepare an updated dangerous cargo list. This list shall contain at least the following information: Stow position, Container number, Line operator, Port of loading / discharge, DG class, UN number, proper shipping name, weight, flash point and EMS. Such list for reporting to authorities shall be made with utmost caution.

6) The Chief Officer shall prepare a copy of the dangerous cargo stowage plan (indicating DG class & location) along with a dangerous cargo list (indicating Location, Container number, DG class and UN number), and these along with any special guidelines from shippers, shall be kept on Bridge (for ready reference of the watch keeping officer) and in Fire wallets at gangways.