Mekong River Commission
For Sustainable Development



Safety Booklet for Port Staff

on the handling and storage of dangerous goods in the Lower Mekong Basin



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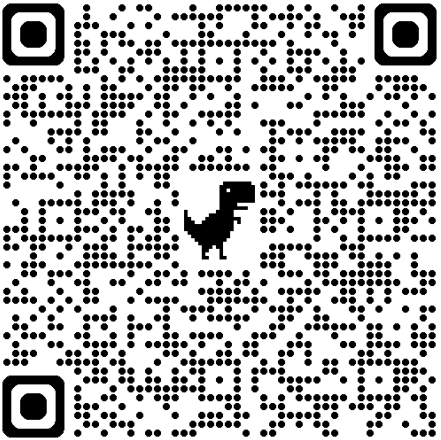
1. Introduction

1.1. Objectives

This safety booklet is designed to help ensure the safe, efficient, and environmentally responsible carriage, handling, and storage of Dangerous Goods (DGs) along the Mekong River. Its main objectives are to:

- Promote safe practices aboard vessels, especially tankers.
- Inform vessel crew of potential dangers and associated risks.
- Provide clear guidance on how to avoid accidents and protect both the crew and the environment.
- Support sustainable inland waterway transport in the Lower Mekong Basin.

For more comprehensive information, scan the QR code to access the full version of the *Safety Book for Vessel Crew and Port Staff on the Carriage, Handling, and Storage of Dangerous Goods in the Lower Mekong Basin*.



1.2. Key responsibilities of port staff

The port staff has key responsibilities when it comes to the handling and storage of DGs, including:

1	**Classification and Identification** ○ Ensures that all DGs are correctly classified according to the International Maritime Dangerous Goods (IMDG) Code. ○ Ensure all DGs are correctly labeled and marked.
2	**Training and Awareness** ○ Receive thorough training on the handling, storage, and emergency procedures related to DGs. ○ Update the latest safety protocols and regulations.
3	**Storage and Segregation** ○ Stow DGs in designated areas. ○ Maintain safe storage conditions.
4	**Documentation and Notification** ○ Keep records of handled and stored DGs. ○ Notify relevant authorities and stakeholders about the DGs as required by law.
5	**Safety Measures and Equipment** ○ Ensure the availability and proper functioning of safety equipment. ○ Conduct regular safety drills and inspections to ensure preparedness for emergencies.

6	**Risk Assessment and Monitoring** ○ Perform DGs' risk assessments. ○ Continuously monitor the storage areas.
7	**Emergency Response** ○ Develop and implement emergency response plans for DGs' incidents. ○ Coordinate with local emergency services to manage and mitigate any incidents effectively.

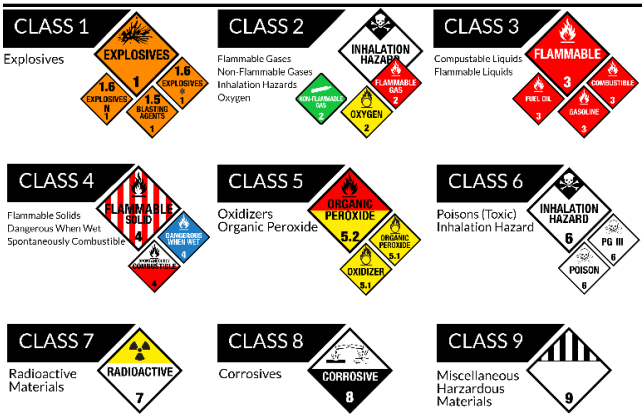
2. Classification and Identification of Dangerous Goods

2.1. Classification of Dangerous Goods

DGs (IMO, 2018) are classified into nine classes based on the type of hazard they present. Some of these classes are further divided into divisions, depending on the specific characteristics of the substance.

Below is an overview of the nine classes and their divisions[1]:

[1] Image source: https://www.saferack.com/guide-hazmat-placards-un-numbers/



Substances (IMO, 2018), which include mixtures and solutions, are assigned to one of the classes 1-9 according to the hazard they present, with the most predominant hazard determining their classification. The following lists the classes and their divisions:

Class 1 - Explosives (divided into 6 hazard divisions):

- Division 1.1: substances and articles which have a mass explosion hazard
- Division 1.2: substances and articles that have a projection hazard but not a mass explosion hazard
- Division 1.3: substances and articles that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard

- Division 1.4: substances and articles which present no significant hazard
- Division 1.5: very insensitive substances which have a mass explosion hazard
- Division 1.6: extremely insensitive articles that do not have a mass explosion hazard

Class 2 - Gases are subdivided further according to the primary hazard of the gas during transport:

- Class 2.1: flammable gases
- Class 2.2: non-flammable, non-toxic gases
- Class 2.3: toxic gases

Class 3 - Flammable liquids

Class 4 - Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases:

- Class 4.1: flammable solids, self-reactive substances, and desensitized explosives
- Class 4.2: substances liable to spontaneous combustion
- Class 4.3: substances which, in contact with water, emit flammable gases

Class 5 - Oxidizing substances and organic peroxides:

- Class 5.1: oxidizing substances
- Class 5.2: organic peroxides

Class 6 - Toxic and infectious substances:

- Class 6.1: toxic substances
- Class 6.2: infectious substances

Class 7 - Radioactive material

Class 8 - Corrosive substances

Class 9 - Miscellaneous dangerous substances and articles

Note: The numerical order of the classes and divisions does not indicate their level of danger.

2.2. Dangerous Goods Transport along the Mekong River

In the Mekong River Basin (MRC, 2012), inland waterway transport of dangerous goods is currently limited to the following seven classes:

Label	Class and Type
	Fireworks (Class 1: explosives)
	Liquified petroleum gas (LPG) (Class 2: gases)
	Fuel oil, diesel oil, kerosene oil, gasoline (MOGAS, M92, M95, M97), and jet fuel (all Class 3: flammable liquids)

Label	Class and Type
	Lignite (brown coal) (Class 4: flammable solids)
	Ammonium nitrate and fertilizers (Class 5: oxidizing substances)
	Pesticides, mercury, and sodium cyanide used for gold mining (Class 6: toxic and infectious substances)
	Several packaged DGs, mostly transported in containers (Class 9: miscellaneous dangerous substances)

Note: DGs from Class 7 (Radioactive Material) and Class 8 (Corrosive Substances) are currently not transported along the Mekong River (MRC, 2012).

If the DGs you're handling are not listed here, always consult local authorities and refer to the International Maritime Dangerous Goods (IMDG) Code for proper guidance (IMO, 2018).

2.3. Possible hazards and risks of DGs

Possible hazards and risks	Label
Class 1: Fireworks: risks for explosion.	

Class 2: Liquefied Petroleum Gas (LPG): risks for ignition and irritation of the eyes and respiratory system.	
Class 3: Flammable liquids: risk of burning fire with toxic fumes, very hot and fast.	
Class 4: Lignite (brown coal): risk for spontaneously catching fire by releasing a toxic gas.	
Class 5: Fertilizers: risk of oxidizing other materials with spontaneous combustion. **Ammonium Nitrate** becomes explosive when organic materials are added.	
Class 6: Pesticides, mercury, and cyanide: risk of causing death or harm to human health if swallowed or inhaled by skin contact.	
Class 9: Miscellaneous: As a diverse range of articles and substances is included in this class, there are no general risks that can be linked to the class overall.	


Firework explosion


LPG ignition


Brown coal ignition

Note: Detailed information on specific risks and hazards for each class of DGs (MRC, 2012) can be found in Appendix 1 in the full book (MRC, 2014).

2.4. Signs and Signals

Safety and health signs use colors and symbols to provide safety and health information or instructions for a specific object, activity, or situation at work (MRC, 2012):

Color	Meaning or purpose	Instructions and information
Red	Prohibition sign	Dangerous behaviour Danger alarm Stop, shutdown, Emergency cut-out devices, Evacuate Fire-fighting equipment Identification and location
Yellow or amber	Warning sign	Warning sign Be careful, take precautions Examine
Blue	Specific behavior or action	Specific behavior or action Wear personal protective equipment
Green	Emergency escape, first aid sign	Doors, exits, routes, equipment, facilities No danger Return to normal

Warning signs (MRC, 2014)



Corrosive substances



Explosive atmosphere



Oxidizing substances



Flammable substances



Harmful/irritating substances



Infectious substances



Explosive substances



Radioactive material



Toxic substances

Prohibition signs (MRC, 2014)



No access



No fire or open flames



No drinking water



No pedestrians



No smoking



No water for fire extinguishing



Specific behaviour or action signs (MRC, 2014)


Ear protection


Eye protection


Face mask


Pedestrians


Protective clothes


Respirator mask


Safety gloves


Safety helmet


Safety shoes

Emergency escape and first aid signs (MRC, 2014)



First aid kit



Stretcher



Emergency call



Eye shower



Emergency shower



Assembly point







Escape way/Emergency exit

2.5. Labeling and marking

Labels and markings are used to identify the type of hazardous material being transported. These labels provide essential information to handlers and emergency responders. There are two types of labels:

1. **Hazard Class Labels:** Indicate the specific class of the DGs, as presented in Section 2.1. Examples of hazardous material (hazmat) placard and marking[2]:



Placard with UN number



Placard with orange panel
Orange panel has UN number

2. **Handling Instructions Labels**: Guide to proper handling and stowage of the DGs. Examples of handling labels:



Magnetized material



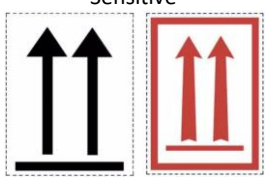
Time & Temperature Sensitive



fragile goods



Keep away from heat


Package orientation for liquid DGs

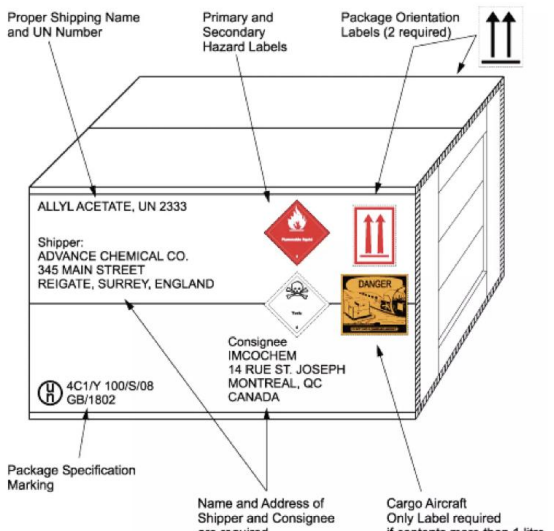


Cryogenic liquids

The Proper Shipping Name for the DGs and the corresponding UN Number, preceded by the letters "UN", are displayed on each package (IMO, 2018). In the case of unpackaged articles, the marking can be on the article, cradle, handling, storage, or

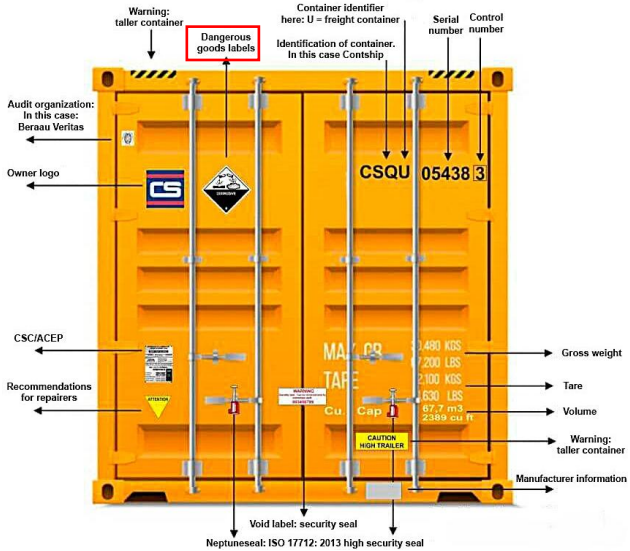
[2] Image source: https://www.saferack.com/guide-hazmat-placards-un-numbers/

launching device. A detailed list of Proper Shipping Name and the corresponding UN Number can be found in Appendix 5 of the full book. A typical package marking is:
CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (caprylyl chloride) UN 3265.
Below (IAEA, 2018) is an example of marking and labeling of DGs:



Once DGs are transported via a container, the container must be labeled as below[3]:

[3] Image source: https://www.leghorngroup.in/hazard-class-labels-adr-imo/


Warning:
taller container
Dangerous
goods labels
Container identifier
here: U = freight container
Identification of container.
In this case Contship
Serial
number
Control
number
Audit organization:
In this case:
Beraau Veritas
Owner logo
CSQU 05438 3
CSC/ACEP
Recommendations
for repairers
Gross weight
Tare
Volume
Warning:
taller container
Manufacturer information
CAUTION
HIGH TRAILER
Void label: security seal
Neptuneseal: ISO 17712: 2013 high security seal


1992
1992
1992

3. Training and Awareness of Dangerous Goods

3.1. Appropriately training and certification

Appropriate training and certification are essential for safety and compliance. Here are some key steps:

1. **International Maritime Dangerous Goods (IMDG) Code Training**: Ports that handle significant quantities of DGs should have at least one staff member trained and certified in DG handling according to the IMDG Code.
2. **Regular Refresher Courses**: Port staff should participate in regular refresher courses to stay updated with the latest regulations and best practices.
3. **Competency-Based Training**: Implementing competency-based training and assessment ensures port staff are knowledgeable and competent in handling DGs.
4. **Documentation and Records**: Maintain detailed training and certification records to ensure compliance and easy verification.

3.2. Regular training on safety procedures and regulations

The following information (MRC, 2012) should be provided regularly to the port staff:

Contents	Repetition
Properties of DGs and dangerous substances	Once a year (If there are new chemicals with other properties, the information must be given immediately)

Contents	Repetition
What kind of personal protective equipment is available, and how to use it	Once a year
When personal protective equipment (PPE) must be replaced with new one	Once a year
How to read operating instructions	Once a year
How to react in case of an emergency	Once a year, in combination with emergency training
Which information is essential for the supervisor or the fire brigade in case of an emergency	Once a year
How to handle a spillage	Once a year
How to fight a fire by using fire extinguishers	Once a year

4. Proper Storage and Segregation

The detailed stowage and segregation for each substance or material is provided in Part 3 - *Dangerous Goods List and limited quantities exceptions* (IMO, 2018) of the IMDG Code.

4.1. Stowage

General provisions

- Where stowage is permitted on or under the deck, it is recommended to store items under the deck whenever possible. However, stowing them on deck is recommended for certain class 1 articles whose main hazard is producing smoke or toxic fumes.
- Fibreboard boxes and packages susceptible to water damage should be stored below the deck. If stored on deck, they must always be protected from exposure to weather or water.
- Stowage on deck should be prescribed in cases where:
    1. constant supervision is required; or
    2. accessibility is particularly required; or
    3. there is a substantial risk of the formation of explosive gas mixtures, the development of highly toxic vapors, or unobserved corrosion of the ship.
- When DGs are stored on deck, it is essential to keep free and unobstructed access to hydrants and sounding pipes.
- At all times, the stowage of DGs must be organized in the following ways:
    1. Ensure clear walkways and access to all facilities necessary for the safe operation of the ship.

2. Ensure compliance with special stowage provisions for goods that pose hazards is met.

- Notwithstanding the stowage provisions given in the Dangerous Goods list (IMO, 2018), empty uncleaned receptacles, which shall be stowed on deck only when full, may be stowed on deck or under deck in a mechanically ventilated cargo space. Empty uncleaned cylinders that carry a label of class 2.3 shall be stowed on deck only.
- Where it is necessary to prevent pressure build-up, decomposition, or polymerization of a substance. The packages need to be stowed shaded from radiant heat. which includes protection from strong sunlight.
- When it is indicated in the Dangerous Goods List that the substances are to be stowed shaded from radiant heat. Stowage under the deck should be "away from" sources of heat.
- Where, for certain dangerous goods, protection from sources of heat is required. This includes protection from sparks, flames, steam pipes, heating coils, top or side walls of heated fuel and cargo tanks, and bulkheads of machinery spaces. These bulkheads should be insulated to meet A-50 standards or similar, except when dealing with explosives. In that case, besides having an A-60 insulated bulkhead, there should also be extra space “away from” the explosives and other stowage.
- Portable tanks should not be over-stowed by other cargo transport units. Unless they are designed for that purpose and transported in specially designed ships, or unless they are specially protected to the satisfaction of the competent authority.

Stowage in relation to living quarters

- When stowage needs to be stored away from living areas, it is important to consider that vapours could still leak into living spaces, machinery spaces, and other work areas via entrances or other openings in bulkheads or through ventilation ducts.
- The criteria for identifying the substances, materials and articles for which stowage is required are:
  1. volatile toxic substances;
  2. volatile corrosive substances;
  3. substances which, in moist air, produce toxic or corrosive vapours;
  4. substances that evolve strongly narcotic vapours;
  5. flammable, toxic, or corrosive gases of class 2.
- All infectious substances should be stowed "separated by a complete compartment or held from" living quarters.

Stowage in relation to undeveloped films and plates, and mailbags

- Undeveloped photographic films and plates, and mailbags (which shall be assumed to contain them), will be segregated from class 7 materials.

4.2. Segregation

Segregation groups

For segregation, DGs having certain similar chemical properties have been grouped as listed below:

Segregation Group Code	Segregation Group	Description
SGG1	1	Acids

Segregation Group Code	Segregation Group	Description
SGG2	2	ammonium compounds
SGG3	3	bromates
SGG4	4	chlorates
SGG5	5	chlorites
SGG6	6	cyanides
SGG7	7	heavy metals and their salts (including their organometallic compounds)
SGG8	8	hypochlorites
SGG9	9	lead and its compounds
SGG10	10	liquid halogenated hydrocarbons
SGG11	11	mercury and mercury compounds
SGG12	12	nitrites and their mixtures
SGG13	13	perchlorates
SGG14	14	permanganates
SGG15	15	powdered metals
SGG16	16	peroxides
SGG17	17	azides
SGG18	18	alkalis

Note: Further details on segregation can be found in Appendix 5 of the full book.

Special provisions for segregation

No segregation needs to be applied:

1. Between dangerous goods of different classes comprising the same substance but varying only in water content, such as sodium sulphide in classes 4.2 and 8, or for class 7 if the difference is due to quantity only.

2. Between dangerous goods that belong to a group of substances of different classes, but for which scientific evidence exists that they do not react dangerously when in contact with each other. The substances listed in the table below are compatible with one another.

The following table shows the general segregation provisions between the various DG classes:

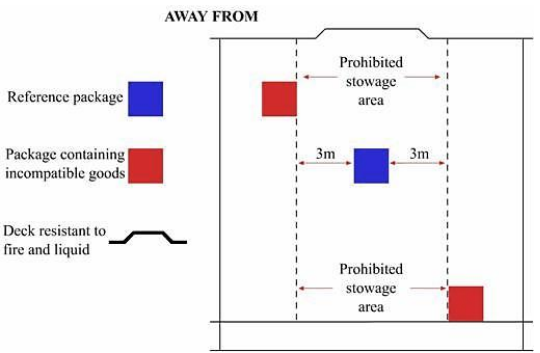
CLASS		1.1 1.2 1.5	1.3 1.6	1.4	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
Explosives	1.1, 1.2, 1.5	*	*	*	4	2	2	4	4	4	4	4	4	2	4	2	4	X
Explosives	1.3, 1.6	*	*	*	4	2	2	4	3	3	4	4	4	2	4	2	2	X
Explosives	1.4	*	*	*	2	1	1	2	2	2	2	2	2	X	4	2	2	X
Flammable gases	2.1	4	4	2	X	X	X	2	1	2	2	2	2	X	4	2	1	X
Non-toxic, non-flammable gases	2.2	2	2	1	X	X	X	1	X	1	X	X	1	X	2	1	X	X
Toxic gases	2.3	2	2	1	X	X	X	2	X	2	X	X	2	X	2	1	X	X
Flammable liquids	3	4	4	2	2	1	2	X	X	2	2	2	2	X	3	2	X	X
Flammable solids (including self-reactive substances and solid desensitized explosives)	4.1	4	3	2	1	X	X	X	X	1	X	1	2	X	3	2	1	X
Substances liable to spontaneous combustion	4.2	4	3	2	2	1	2	2	1	X	1	2	2	1	3	2	1	X
Substances which, in contact with water, emit flammable gases	4.3	4	4	2	2	X	X	2	X	1	X	2	2	X	2	2	1	X
Oxidizing substances (agents)	5.1	4	4	2	2	X	X	2	1	2	2	X	2	1	3	1	2	X
Organic peroxides	5.2	4	4	2	2	1	2	2	2	2	2	2	X	1	3	2	2	X
Toxic substances	6.1	2	2	X	X	X	X	X	X	1	X	1	1	X	1	X	X	X
Infectious substances	6.2	4	4	4	4	2	2	3	3	3	2	3	3	1	X	3	3	X
Radioactive material	7	2	2	2	2	1	1	2	2	2	2	1	2	X	3	X	2	X
Corrosive substances	8	4	2	2	1	X	X	X	1	1	1	2	2	X	3	2	X	X
Miscellaneous dangerous substances and articles	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The numbers and symbols in the table above have the following meanings:

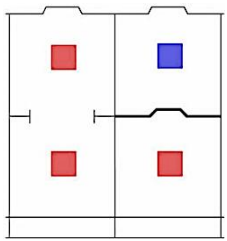
1 – “away from”
2 – “separated from”
3 – “separated by a complete compartment or hold from”
4 – “separated longitudinally by an intervening complete compartment or hold from”
X – the Dangerous Goods List must be consulted to verify whether there are specific segregation provisions
* – segregation provisions between class 1 substances should be consulted with the local authority and follow the IMDG Code

Segregation of packages containing DGs and stowed in the conventional way

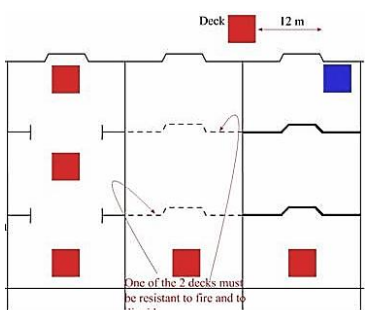
1. ***Away from**:* Effectively segregated so that the incompatible goods cannot interact dangerously in the event of an accident. However, they may be transported in the same compartment, hold, or *on deck,* provided a minimum horizontal separation of **3 metres is maintained**.



2. ***Separated from***: Segregated in different compartments or holds when stowed under deck. Provided the intervening deck is resistant to fire and liquid, a vertical separation, such as in different compartments, may be accepted as equivalent to this segregation. For on-deck stowage, this segregation means a separation of at least 6 metres horizontally.

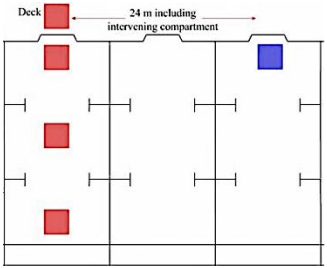


3. ***Separated by a complete compartment or hold from***: Goods can be separated either vertically or horizontally. If the decks in between are not fire and liquid-resistant, then only a longitudinal separation (by a complete compartment or hold) is acceptable. For on-deck storage, this means **a horizontal separation of at least 12 meters.** The same distance applies if one package is on deck and the other is in an upper compartment.



4. ***Separated longitudinally by an intervening complete compartment or hold from***: In addition to vertical separation, if there is a package under the deck and one on

the deck, there must be a minimum distance of 24 meters between them, including a complete compartment. For on-deck storage, this means maintaining a longitudinal separation of **at least 24 meters**.



Segregation in cargo transport units

- DGs that must be segregated from each other should not be transported in the same cargo transport unit. The exception being DGs that are required to be separated "away from" each other, these goods may be transported in the same cargo transport unit with the approval of the competent authority. In such cases, an equivalent standard of safety shall be maintained.
- DGs stowed in the conventional way shall be segregated from goods transported in open cargo transport units.
- DGs stowed in the conventional way shall be segregated from goods transported in closed cargo transport units, with the exception:
  1) Where "away from" is required, no segregation between the packages and the closed cargo transport units is required.
  2) Where "separated from" is required, the segregation between the packages and the closed cargo transport units follows the "away from" requirements.

4.3. Packing of Cargo Transport Units

- Cargo transport units (CTUs) used for the transport of DGs should be adequately maintained and have adequate strength to resist the possible stress imposed by the conditions of the services in which they are employed.

Packing of cargo transport units

- Packages must be carefully inspected before being loaded onto a shipborne barge. Any packages that are damaged, leaking, or releasing contents must not be loaded. Additionally, any excessive water, snow, ice, or dirt stuck to the packages should be removed before loading to ensure safe and secure transport.
- Packages containing dangerous goods, portable tanks, cargo transport units, and any other goods within a shipborne barge shall be properly immobilised by stowage and adequately braced and secured for the voyage.
- Packages should be loaded in such a way that there will be a minimum likelihood of damage to them and to any fittings during transport. Fittings on packages or portable tanks (tank containers) shall be adequately protected.
- When dangerous goods are only part of a cargo load, they should preferably be packed so they are easy to access—for example, packed near the doors of the cargo unit.
- If the doors of a cargo transport unit are locked, the locking mechanism or method should allow for immediate opening during emergency scenarios.

- Before being packed, cargo transport units shall be visually examined for damage. If evidence of material damage is found, the cargo transport unit shall not be packed.
- Irrelevant markings, labels, and placards. Orange panels, signs, and marine pollutant marks shall be removed or masked before packing a cargo transport unit.
- Those responsible for packing dangerous goods into a cargo transport unit shall provide a "container/vehicle packing certificate". This document is not required for tanks.
- Cargo transport units shall be loaded so that the cargo is uniformly distributed consistent with the referenced guidelines.

Empty cargo transport units

- Once a cargo transport unit containing dangerous goods has been unpacked or unloaded, steps must be taken to ensure that there is no contamination that could make the unit hazardous.
- After unpacking or unloading corrosive substances, particular attention shall be paid to cleaning, as residues may be highly corrosive to the metal structures.

4.4. Handle and Store DGs in the LMB's Ports

- Check that DGs are labelled, packed, marked, and documented before acceptance (follow the instructions on page 4 and refer to the IMDG code (IMO, 2018) for more details).
- Secure dangerous cargo to protect the vessel crew and port staff.
- Follow specific loading instructions: e.g., orientation, stacking, dryness, temperature control (see a sample

loading/unloading checklist in the Appendix 2 of the full book).

- Prevent the movement of dangerous goods packages.
- Protect class 2, 3, 4, and 5 goods from heat and sunlight; ensure ventilation. Follow the segregation rules:

CLASSES							
		2	3	4	5	6	9
2	Flammable gases						
3	Flammable liquids						
4	Flammable solids						
5	Oxidizing substances						
6	Toxic substances						
9	Miscellaneous						

Should be compatible

Should be kept apart by at least 3 m

Should be segregated by at least 5 m

- Class 1 goods (explosives) must always be kept separate from other classes of DGs in an isolated location. For more details on class 1 goods, see Appendix 1 of the full book.
- Class 7 goods (radioactive material) can only be transported on specialized vessels that comply with the Regulations for the Safe Transport of Radioactive Material (IAEA, 2018).

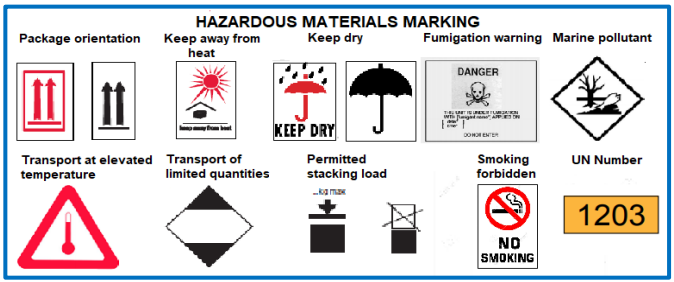
Note: Specific actions for handling and storing DGs are outlined in Appendix 1 of the full book.

4.5. Prevent Exposure to Possible Hazards

- Know which materials onboard represent hazards.



- Read and understand emergency procedures.
- Always use the proper personal protection equipment (PPE) (see page 39)
- Ensure all hazardous materials are properly labeled and marked.
- Ensure that all dangerous materials are properly stored (see page 19).
- Never smoke, eat, or drink while handling dangerous/hazardous materials.
- Report any concerns about damaged packing, potential leaks, or spills.



4.6. Transfer, loading, and unloading packaged DGs

Use a checklist (see a sample checklist in Appendix 2 of the full book) to ensure both port and vessel representatives understand the transfer and precautions (IMO, 2007).

1	Use appropriate PPE (follow the instructions on page 39)
2	Check if the DGs are packaged so that they do not pose a risk to life, health, property, or the environment
3	Check that the front quays are only used for the short-term storage of DGs
4	Check if an overall inventory of the DGs and a layout plan of the port is available
5	Check that incompatible hazardous substances are adequately separated from each other during transport and storage
6	Check if properly designed and implemented work practices and procedures are available
7	Do not smoke or introduce any other sources of ignition



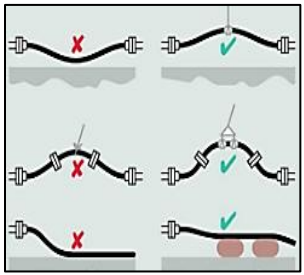


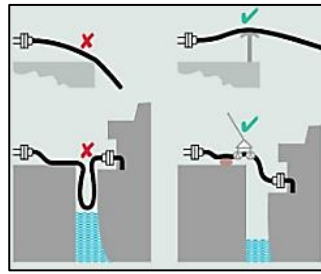
4.7. Loading and Unloading Liquid DGs in Bulk

Use a checklist to ensure both port and vessel representatives clearly understand the transfer procedures and all necessary precautions (a sample checklist can be found in Appendix 2 of the full book).



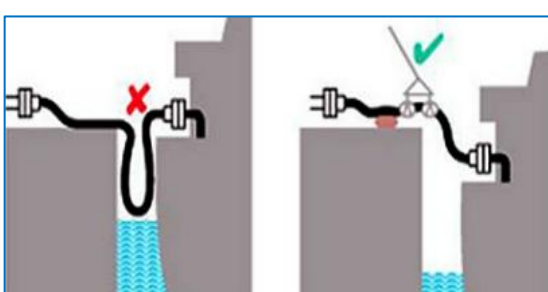
1	Check prior to an oil transfer operation if an emergency response plan is available
2	Use appropriate PPE (follow the instructions on page 39).
3	Check if the transfer area is clear of any ignition sources
4	Check if both port tanks and vessel are properly grounded
5	Check if the pump system is tested periodically
6	Inspect the fuel transfer hoses visually. Hoses must not lay in the water between the vessel and the dock
7	Check if all connections are liquid-tight and secured
8	Do not smoke or introduce any other sources of ignition





4.8. Important Issues during Bunkering

- Complete a bunker **checklist** before bunkering (see sample checklist in Appendix 2 of the full book).
- Ensure bunker hoses are properly hung and clear.
- Check bunker hoses for leak-free connections.
- Prohibit smoking and open flame repairs.
- Have resources ready to contain oil leaks or overflows.



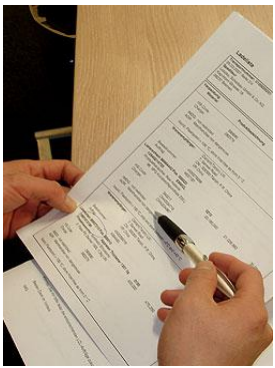

No smoking
No naked light
Oil spill
Foam

5. Documentation and Notification

5.1. Acceptance of Dangerous Goods

Before accepting any DGs in the port or terminal:

- Check if a prior declaration for the handling of dangerous and/or contaminating goods has been submitted to the Port Authority (if present, to the Harbor Master) no later than 24 hours before the scheduled handling time.
- Verify that goods handlers have documents detailing the dangerous goods and the emergency measures to be taken.
- Confirm that DGs are properly labeled, packed, marked, described, and certified.





5.2. Comprehensive List of Documentation and Compliance

1	*Documentation* • **Shipping Papers**: Verify the proper shipping name, UN number, and classification. • **Certificates**: Ensure all necessary certificates (e.g., DGs Declaration) are complete and up-to-date. • **Emergency Response Information**: Have detailed emergency response procedures readily available.
2	*Packaging and Labeling* • **Packaging**: Confirm that all DGs are in UN-approved packaging. • **Marking**: Ensure packages are marked with the proper shipping name, UN number, and any required handling instructions. ○ **Labeling**: Check that all packages have the correct hazard labels and handling labels.
3	*Stowage and Segregation* • **Stowage Plan**: Develop a stowage plan that complies with the International Maritime DGs (IMDG) Code. • **Segregation**: Ensure incompatible goods are segregated according to IMDG Code requirements. ○ **Securing Cargo**: Verify that all DGs are properly secured to prevent movement during transit.
4	*Safety Equipment* • **Personal Protective Equipment (PPE)**: Ensure all crew members have access to appropriate PPE. • **Fire-fighting Equipment**: Fire extinguishers and fire-fighting equipment are in good working order.

	• **Spill Response Kits**: Have spill response kits available and ensure crew members are trained in their use.
5	*Training and Briefing* • **Crew Training**: Confirm that all crew members have received training on handling DGs. • **Safety Briefing**: Conduct a safety briefing to review emergency procedures and the location of safety equipment.
6	*Communication and Navigation* • **Communication Systems**: Test all communication systems to ensure they are operational. • **Navigation Equipment**: Verify that navigation equipment is functioning correctly and updated.
7	*Pre-Voyage Inspection* • **Visual Inspection**: Conduct a thorough visual inspection of all DGs and their packaging. • **Leak Checks**: Check for any signs of leaks or damage to the packaging.
8	*Emergency Procedures* • **Emergency Contacts**: Have a list of emergency contacts readily available. • **Drills**: Conduct emergency drills to ensure crew readiness.

5.3. Comprehensive Checklist for DGs

1	**Identification** ○ Verify the proper shipping name and UN/Identification number. ○ Ensure the classification of the goods, including hazard class and packing group.
2	**Packaging** ○ Use UN specification packaging. ○ Check for any special provisions or packing instructions.
3	**Marking** ○ Proper shipping name and UN/Identification number. ○ From and to addresses. ○ Quantity and any other shipment-specific markings.
4	**Labeling** ○ Primary and subsidiary hazard labels. ○ Handling labels (e.g., orientation arrows).
5	**Documentation** ○ Prepare the Shipper's Declaration for DGs. ○ Complete all necessary transport documents.
6	**Other Considerations** ○ Placarding, if required. ○ Special provisions or state/operator variations. ○ Ensure no incompatible dangerous goods are packed together.

Note: The sample formsfor the DG declaration and checklists are available in the full book's Appendix for reference.

6. Safety Measures and Equipment

6.1. Code of Safe Working Practices

In addition to national and regional regulations, ports and terminals handling large quantities of dangerous goods must have an internal Safety Management Code. This Code should cover responsibilities, safety and health systems, operational and Dangerous Goods handling procedures, emergency arrangements, environmental protection, and the use of PPE and work equipment.

Additionally, they must comply with national safety and firefighting equipment standards or establish their own if none exist. (UN ESCAP, 2023; IMO, 2007).

Oil and gas terminals must have a comprehensive, up-to-date Terminal Operating Code detailing procedures, practices, responsibilities, and relevant drawings. This manual should be available in the working language to all personnel. Additionally, an emergency response manual should outline procedures for emergencies such as fires, spills, or medical issues (CCNR&OCIMF, 2010).

Note: It is recommended to consult these codes regularly as needed.

6.2. Personnel Protective Equipment (PPE)

Personal protective equipment must be used when risks cannot be reduced to an acceptable level by safe working practices.



PPE \ Tasks	Normal port work	Machine operations	Cargo operations	Bunkering	Confined spaces	Painting	Cleaning work
Safety suit							
Safety shoes							
Safety helmet							
Gloves							
Eye protection							
Ear defenders							
Dusk mask							

Essential May be needed Not needed

6.3. Port and Terminal Lifesaving Equipment

- Personnel should wear life vests near water, and life buoys should be available at front quays (IMO, 2017).







Life jacket: Clip together both buckles and pull the strap until adjusted around your waist

- Personnel handling dangerous goods should wear protective clothing (boiler suit, safety shoes, glasses, helmet).
- Terminals should have at least one or two sets of fire proximity and entry suits, including helmets, gloves, and boots.



6.4. Maintenance and Testing of Critical Equipment

Ports and Terminals handling DGs in large quantities should have a Maintenance, Inspection, and Testing Program (MITP) for critical equipment such as lifting equipment, pump rooms and cargo pumps, cargo hoses, firefighting and lifesaving appliances. The program should include:

the establishment of maintenance intervals.
the methods and frequency of inspection.
the specifications of the measuring equipment to be used.
the establishment of appropriate acceptance criteria.
the assignment of responsibility for inspection and maintenance activities.
the definition of reporting requirements and mechanisms.

Consult this program on a regular basis!



Lifting equipment



Pump room



Cargo hoses

7. Risk Assessment and Monitoring

Risk assessment and monitoring are crucial for port staff handling dangerous goods. Here are some key points:

7.1. Risk Assessment

- **Identify Hazards:** Recognize potential dangers associated with the handling and storage of dangerous goods.
- **Evaluate Risks:** Assess the likelihood and impact of identified hazards.
- **Implement Controls:** Develop measures to mitigate identified risks, such as safety protocols and protective equipment.

7.2. Monitoring

- **Continuous Observation:** Regularly monitor operations to ensure compliance with safety protocols.
- **Training Programs:** Ensure all staff are trained in handling dangerous goods and emergency procedures.
- **Incident Reporting:** Establish a system for reporting and investigating incidents to prevent future occurrences.

7.3. Regular Inspections of DGs

Port staff shall regularly inspect the storage areas and monitor the condition of DGs throughout the voyage. Here are some steps for inspections to ensure safety and compliance:

1. **Scheduled Inspections**: Conduct inspections at regular intervals to ensure ongoing compliance. This could be weekly, monthly, or as required by regulations and policies.

2. **Visual Inspection**: Check for any signs of damage, leaks, or spills in the storage area. Ensure all containers are appropriately labelled, and hazardous materials are stored according to their classification.
3. **Verify Documentation**: Ensure that all necessary documentation, including keeping the Safety Data Sheets (SDS) up to date and readily available.
4. **Emergency Equipment**: Verify that emergency equipment such as fire extinguishers, spill containment kits, and PPE is in good condition and easily accessible.
5. **Record Keeping**: Maintain detailed records of all inspections, including any identified issues and the actions taken to resolve them.

Safety Data Sheets [13] provides product safety and DG transportation requirements. An SDS must state the following information on the DG:

- Section 1 - Identification: Product identifier and chemical identity
- Section 2 – Hazard(s) identification
- Section 3 - Composition and information on ingredients
- Section 4 - First-aid measures
- Section 5 - Fire-fighting measures
- Section 6 - Accidental release measures
- Section 7 - Handling and storage, including how the chemical may be safely used
- Section 8 - Exposure controls and personal protection
- Section 9 - Physical and chemical properties
- Section 10 - Stability and reactivity
- Section 11 - Toxicological information
- Section 12 - Ecological information

- Section 13 - Disposal considerations
- Section 14 - Transport information
- Section 15 - Regulatory information
- Section 16 - Any other relevant information

Note: A sample Safety Data Sheet can be found in Appendix 2 of the full book.

7.4. Inspection of Tanks

Tanks (MRC, 2012) must be marked with the chemical name of the contents and labeled with the enlarged symbol. Inspection can be categorized as regular in-service inspection or regular out-of-service inspection. An in-service inspection using a checklist may be a simple, regular walk around the tank. Out-of-service inspection is a detailed inspection of the complete tank structure using a standard.

Tank wall internal inspection of individual (stand-alone) tanks not used for the storage of toxic or odorous class 3 products (flammable liquids with a flashpoint of 55 °C or higher, but not above 100 °C) needs to be carried out at least every 15 years. However, more frequent tank inspections are recommended due to the weather and other exceptional circumstances such as humidity, salinity, and corrosivity. For groups of tanks (tank farms with the same chemicals), only every fourth tank needs to be inspected, according to the scheme for individual tanks. For the other tanks, the period of 15 years can be extended to 20 years if no significant failures are found. However, if substantial failures are discovered, the other tanks in the group must be inspected as soon as possible.

- External inspection is done by measuring the thickness of walls and fixed roofs of all the tanks at least every 5 years.

- The minimum required thickness of the steel plates is 2 mm.
- Floating roof seals require inspection at least every six months. Regular seal checks and early repairs are recommended.
- Vents should be externally inspected at least once a year to assess their opening, closing, and sealing performance.
- Valves, steps, platforms, and instruments need to be inspected regularly (once a month) to ensure good performance.
- Earth wires have to be inspected once a month.
- In this case, a group of tanks is considered to be situated close to each other, constructed in the same way, stored the same product, and used under the same conditions.
- Fire systems need to be inspected at least every year. This includes tests on whether the material is ready for immediate use.

7.5. Inspection of hoses and pipes

The hoses and pipes used for filling the tanks or for the mode of transport need to be inspected before use. They should withstand a pressure test of 4 bar. This test must be conducted annually. If the hoses and pipes are used for substances with high pressure, the test pressure must be higher than the substance's pressure.

The hoses and pipes must be checked visually to ensure they are not damaged. If they are damaged, they have to be replaced immediately. The material of the hoses and pipes must be suitable for handling dangerous substances, which means steel requires a special coating to resist corrosive substances.

7.6. Working in confined spaces

Ensure that all necessary considerations and safety measures for working in confined spaces have been addressed. This includes:

Risks (fire, explosion, toxic gas)
Communications equipment
Atmosphere testing equipment
Ventilation
Suitable working equipment
Personnel Protection Equipment
Access and exit
Fire prevention & firefighting
Static electricity
Smoking
Emergency arrangements
First aid equipment









7.7. Tank Cleaning

- Plan tank washing operations with strict procedures, risk assessment, and preventive measures.
- Restrict access, provide extra firefighting equipment, and control ignition sources.
- Ensure the tank atmosphere remains non-flammable during washing.
- Use appropriate PPE (follow the PPE instructions on page 39).
- Prevent ignition or sparks from mechanical defects.
- Verify that cleaning chemicals do not pose toxicity or flammability hazards.
- Display signs prohibiting smoking and naked lights.





7.8. Hot Work

	**Remove Flammable Materials:** Keep flammable items away from the hot work area.
	**Inspect Equipment:** Check all tools and equipment before use.
	**Wear PPE:** Use appropriate PPE (follow the PPE instructions on page 39).
	**Follow Confined Space Procedures:** Use proper safety measures in confined spaces.
	**Turn Off Gas and Dampen the Area:** After finishing, turn off the gas and dampen the area to prevent fires.

8. Emergency Response

8.1. Emergency Planning

Every port handling large quantities of dangerous goods should have a Port Emergency Plan detailing staff duties and responsibilities for emergencies and accidents.

The plan shall include:

1.	Staff duties and chain of command for emergencies and accidents.
2.	Actions to raise the alarm and initial emergency control.
3.	Emergency action plan (time frame, firefighting, rescue, medical treatment, waste disposal).
4.	Use of life-saving appliances.
5.	Location and details of fire-fighting equipment.
6.	Coordination guidelines with authorities.

Every oil terminal should have an Oil Pollution Emergency Plan outlining the special duties and responsibilities of each terminal staff member. And should include how to stop or minimize the spill of oil, noxious, and hazardous substances, as well as how to mitigate their effects.

Note: Always consult these safety documents before handling any dangerous goods.

8.2. Drills for port staff handling DGs

In ports and terminals, where handling DGs in large quantities, it is highly recommended that training drills on emergency response (fire and spill), medical emergency, cleaning and decontamination procedures, communication, and

documentation be organized for all port staff handling DGs. By conducting these drills, the port can ensure that all personnel are well-prepared to handle significant incidents effectively and efficiently. Here are some drill scenarios:

Emergency response drill (fire, spill, and leaks)

Correct use of firefighting systems, PPE, and coordination with emergency response teams.

Cargo handling and stowage drill

Safe loading and unloading practices for flammable, corrosive, or toxic cargo, including an understanding of the rules for stowage and segregation, the correct use of containment measures, and compliance with relevant regulations (e.g., the IMDG Code).

Chemical spill containment and decontamination drill

Proper use of PPE, familiarity with spill response materials and equipment, and reporting spills and responses.

Medical emergency drill

First aid for burns, inhalation injuries, and chemical poisoning, and procedures for notifying shoreside medical teams.

Communication and reporting drill

Emergency communication procedures (radio, distress signals), clear and accurate situation reporting.

Environmental protection drill

Proper containment of hazardous substances, use of emergency equipment to contain and clean up spills, and compliance with environmental regulations.

Note: Emergency Response Drill Program for an Inland Waterway Port and Major Oil Spill Drill Scenario samples can be found in Appendices 3 and 4 of the full book.

8.3. Rescue Operations

Man(s) overboard

1.	**Raise the Alarm:** Shout "Man overboard!" loudly and clearly to alert everyone nearby.
2.	**Maintain Visual Contact:** Keep your eyes on the person in the water at all times to help guide rescuers.
3.	**Deploy Flotation Devices:** If the person is within reach, throw a lifebuoy or any available flotation device towards them.
4.	**Alert Emergency Services:** Contact port security or emergency services immediately to report the situation.
5.	**Prepare for Rescue:** Prepare any equipment needed (boat or others) to retrieve the person from the water.
6.	**First Aid:** Provide first aid as needed and keep them warm to prevent hypothermia.

Act quickly and calmly to increase your chances of rescue.

Seriously injured person(s)

1.	**Ensure Safety:** Make sure the area is safe.
2.	**Call for Help:** Alert emergency services immediately.
3.	**Provide First Aid:** Administer basic first aid if trained.
4.	**Use Available Resources:** Utilize any available first aid kits or emergency equipment.
5.	**Document the Incident:** Record the incident's details.
6.	**Prepare for Transport:** If necessary, prepare the injured person for transport to a medical facility. This might

	involve coordinating with emergency services for a safe and efficient transfer.

Prompt and appropriate care is crucial for injured person(s).

8.4. Fire/Explosion

In case of a fire or explosion on an inland waterway vessel or in port, the port staff should:

1.	Sound the fire alarm and begin firefighting.
2.	Avoid contact with dangerous substances, stay away from smoke and vapors, and evacuate personnel.
3.	Stop all operations near the affected area.
4.	Contact emergency operations or a rescue center for expert advice.
5.	Ensure all staff and responders wear appropriate PPE.
6.	Provide first aid and transport injured individuals to medical facilities.
7.	Initiate decontamination and inspect for damage after the incident is controlled.







Resuscitation



Fire blanket



Fire suit

8.5. Dangerous Goods/Oil Spillage

In case of dangerous goods/oil spillage, the port staff should:

1.	Raise the alarm and activate the oil spill response plan.
2.	Follow the Emergency Plan and contact specialized response teams.
3.	Stop or reduce the oil flow if possible.
4.	Evacuate or restrict access to the spill site and avoid contact with dangerous substances.
5.	Wear full protective clothing and breathing apparatus.
6.	Be ready to provide first aid and resuscitation if needed.
7.	Inform authorities immediately if there's a high risk of river contamination.
8.	Properly dispose of recovered oil, contaminated equipment, and waste after cleanup.
9.	Ensure equipment for pollution removal is available.

Equipment for removing pollution due to oil, chemicals, or hazardous substances should be composed of:



Oil boom



Oil skimmer



Absorbent pads



Dispersant

8.6. Firefighting Equipment

Every port or terminal handling DGs in large quantities should have a Firefighting Plan (IMO, 2015), this plan shall include:

1	Firefighting signals (see page 8)
2	Fire hose reels
3	Water hydrants
4	Water or foam cannons
5	Smoke, heat, and gas detectors
6	Personal Protective Equipment (PPE - see page 39)
7	Fire blankets to smother small fires
8	Evacuation routes









Fire hose reel Water hydrant Foam cannon Heat detector

The Firefighting Plan should include the locations and details of all firefighting equipment. Fires should be controlled and extinguished by isolating their source and using the correct extinguishing agents (IMO, 2015).

Below is the recommendation about which extinguishers are suitable for different fire types:

Types of fire / Type of extinguisher	**Flammable solids** e.g., paper, plastic, wood Class A	**Flammable liquids** e.g., paint, petrol, oil Class B	**Flammable gases** e.g., butane, CNG, LPG Class C	**Flammable metals** e.g., titanium, magnesium Class D	**Electrical equipment** e.g., cables, computers, switchboards Class E	**Cooking oils and fats** e.g., chip pans, fryers Class F
Water	✓	✗	✗	✗	✗	✗
Wet chemical	✓	✗	✗	✗	✗	✓
Foam	✓	✓	✗	✗	✗	
Dry powder	✓	✓	✓		✓	
Carbon dioxide				✗	✓	

Key:	✓	Recommended Most effective in this type of fire.		Limited Maybe effective on small fires.	✗	Not Suitable Not effective in this type of fire.

Dry powder extinguishers should be used for explosives, flammable solids, and chemicals. Foam extinguishers can also be used for flammable liquids.

Follow the **P.A.S.S.** method, a basic fire extinguisher training technique, to discharge the extinguisher and put out the fire:

	**P – Pull** out the safety pin on the extinguisher
	**A – Aim** the nozzle at the base of the fire and stand at a safe distance.
	**S – Squeeze** the handles together to release the extinguishing agent that has been trapped inside. Release the handles to halt the discharge.
	**S – Sweep** the base of the fire from side to side until it appears to be out. Look around. Aim, Squeeze, and Sweep if the fire re-ignites.

8.7. First Aid

The Medical First Aid guide (WHO, 1998), contains treatments that are relevant for the handling and carriage of dangerous goods:



Cardiopulmonary resuscitation



Symptoms: Not breathing, but the heart is beating, or breathing, but the heart has stopped.
Treatment: Begin resuscitation immediately - depress the breastbone 4 to 5 cm at 80 to 100 times per minute and alternate 12 breast depressions with 4 mouth-to-mouth breaths.

Lack of oxygen



Symptoms: Difficulty in breathing, a rapid heart pulse, possibly followed by unconsciousness.
Treatment: Give oxygen by means of a face mask and squeeze the bag steadily at about 12 times a minute.

Eye or skin exposure to chemicals



Symptoms: Pain, redness, irritation, swelling, pain, and ulceration.
Treatment: Immediate washing with copious amounts of water for ten minutes, and remove the casualty to the hospital as soon as possible.

Pain relief

Symptoms: Moderate or severe pain
Treatment: Administer paracetamol and ask for medical advice.

Note: Always seek medical advice in all cases!

8.8. Accident Reporting

All severe accidents must be reported to the relevant authorities within 48 hours.

The **Accident Report** should include the following topics:

1. Detailed vessel information.
2. Detailed information (time, location, weather conditions).
3. Vessel activity at the time of the accident.
4. Type of accident.
5. Description of who, what, when, where, and how the accident occurred.
6. Ideas of why the accident happened.
7. Description of the actions taken immediately after the accident.
8. Description of what has been done or proposals of what should be done to prevent this accident from recurring.
9. Details of the person completing the report.

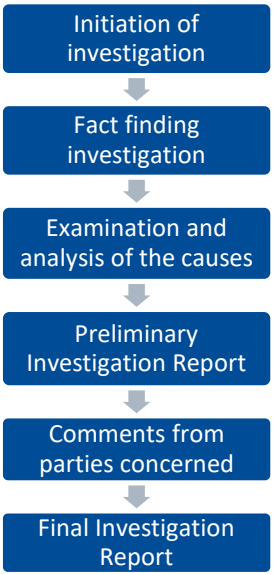
In case of a spill of oil or other DGs, the **Pollution Report** must also be completed, and should include the following:

1. Detailed vessel information.
2. Detailed accident or incident information.
3. Pollution details.
4. Description of the immediate actions after the accident.
5. Description of what has been done or proposals of what should be done to prevent this accident from reoccurring.
6. Details of the person completing the report.

8.9. Accident Investigation

Accident Investigations should always consider three basic questions:

- What happened? The unfolding of the accident is given as a factual, chronological narrative.
- How did the accident occur? The technical circumstances of the accident are identified.
- Why did the accident occur? The reason for the accident is explained based on a thorough examination and analysis of the event.



A proposed procedure is as follows:

The investigation phase aims to gather information on the ship's technical details, accident circumstances, consequences, crew actions, and possible causes.

Possible **consequences** that should be considered are human fatalities, human injuries, human disappearances, ship damage, other property or cargo damage, and environmental pollution.

9. Useful Communication and Coordination

9.1. Cambodia

Emergency rescue:	N/A
Police:	117
Ambulance:	119
Firefighting:	118

National Committee for Disaster Management (NCDM)
New Building St.516, Toul Sangke Commune, Russey Keo District, Phnom Penh
Office Tel: +855 (0)23 864 298 or +855 (0)23 211 171 or +855 (0) 23 882 605
Office fax: +855 (0)23 882 045
Email: administration@ncdm.gov.kh or caccdm@yahoo.com

General Department of Waterway, Maritime Transport and Ports
Office Tel: +855 (0)12 835 867 or +855 (0)23 864110
Office fax: +855 (0)23 864110
Email: mmd@online.com.kh

9.2. Lao PDR

Emergency rescue:	N/A
Police:	1191
Ambulance:	1195
Firefighting:	1190

Ministry of Public Works and Transport (MPWT)
MPWT Department of Waterways (DOW)
Office Tel: +856 (0)21-416430
Office fax: +856 (0)21-416430

Ministry of Natural Resources and Environment (MONRE)
Department for Disaster Management and Climate Change
Office Tel: +856 (0)21 264 543 or +856 (0) 21 262 120
Office fax: +856 (0)21 263 799 or +856 (0)21 262 120

9.3. Thailand

Emergency rescue:	911
Police:	191
Ambulance:	1669
Firefighting:	199

Marine Department of Thailand (Spill notification point)
1278 Yotha Road, Talardnoi Samphanthawong,
Bangkok 10100
Office Tel: +66 (0)2 233 1311 ext. 8
Hotline (24 hours a day): 1199
Office fax: +66 (0)2 238 3017
Email: marine@md.go.th

Marine Office 1, Chiang Rai Branch, Marine Department
Office Tel: + 66 (0)5377 7460
Mobile: + 66 (0)81 168 4997
Office fax: + 66 (0)5377 7461
Email: chiangrai@md.go.th
VHF: 156.05 MHz

Chiang Sean Marine Police, Royal Thai Marine Police
Office Tel: + 66 (0)53 777 003
Mobile: + 66 (0)81 627 0201
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Email: info@iesg.or.th

9.4. Viet Nam

Emergency rescue:	112
Police:	113
Ambulance:	115
Firefighting:	114

Vietnam Maritime and Waterway Administration
No. 8, Pham Hung street, Mai Dich Ward, Cau Giay District, Hanoi
Office Tel: +84.024.37683065
Office fax: +84.024.37683058
Email: cuchhvn@vinamarine.gov.vn

Port Authority 3 (Ho Chi Minh City)
292/37/6-8, Binh Loi Street, Ward 13, Binh Thanh District, Ho Chi Minh City
Office Tel: +84 (0) 28 35531982
Email: cangvu3.viwa@mt.gov.vn

Port Authority 4 (Can Tho)
366D Cach Mang Thang Tam Street, Bui Huu Nghia Ward, Binh Thuy District, Can Tho City
Office Tel: +84 (0)710. 3 88 30 3
Email: admin@pa4.gov.vn

National Committee for Search and Rescue (VINASARCOM)
26 Hoang Dieu Street, Ba Dinh, Hanoi
Office Tel: +844 (0)37333664

10. References

CCNR&OCIMF . (2010). *International safety guide for inland navigation tank-barges and terminals (ISGINTT)*.

IAEA. (2018). *Regulations for the safe transport of radioactive material* (2018 ed., SSR-6 Rev. 1).

IMO. (2004). *Emergency response procedures for ships carrying dangerous goods (The EmS Guide): Supplement to the IMDG Code*.

IMO. (2007). *Revised recommendations on the safe transport of dangerous cargoes and related activities in port areas*.

IMO. (2010). *International Safety Management (ISM) Code and guidelines on its implementation*.

IMO. (2015). *International Code for Fire Safety Systems (FSS Code)*.

IMO. (2017). *International Life-Saving Appliances (LSA) Code*.

IMO. (2018). *International Maritime Dangerous Goods (IMDG) Code*.

MRC. (2012). *Carriage, handling and storage of dangerous goods along the Mekong River – Volume I: Risk analysis*.

MRC. (2014). *Regional action plan for sustainable transport of dangerous goods along the Mekong River*.

UN ESCAP. (2023). *Policy recommendations for safety management of dangerous goods (DG) in the ports of the ESCAP region*.

WHO. (1998). *Medical first aid guide for use in accidents involving dangerous goods (MFAG)*.

11. Personal Notes



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