

MARPOL Annex II – preserving the marine ecosystem is imperative



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Marine pollution is one of the primary concerns facing the maritime industry today. As the volume of chemicals transported by sea continues to increase, so does the threat to human health and the marine environment.

Introduction

Increased knowledge of the impact of chemicals on the marine environment has led to the development and progressive implementation of *MARPOL Annex II*, which aims to protect the marine environment from chemical pollution by noxious liquid substances carried in bulk. Unlike the other MARPOL annexes, which set out regulations for the 'prevention' of pollution, Annex II talks about the regulations for the 'control' of pollution by these noxious liquid substances when carried in bulk.

Defining noxious liquid substances

In MARPOL Annex II, 'noxious liquid substance' means any substance indicated in the Pollution category column of chapter 17 or 18 of the *International Bulk Chemical code (IBC code)* or provisionally assessed under the provisions of regulation 6.3 as falling into that category. The MEPC issues an *annual circular* with the provisional categorisation of liquid substances. The annexes to the circular provide lists of noxious liquid substances with associated categories and minimum carriage requirements, which are established through a tripartite agreement and registered with the IMO Secretariat.

Noxious liquid substances (NLS) are divided into four categories.

Category X: Noxious liquid substances that, if discharged into the sea from tank cleaning or de-ballasting operations, are deemed to present a major hazard to either marine resources or human health, and therefore justify the prohibition of the discharge into the marine environment.

Category Y: Noxious liquid substances that, if discharged into the sea from tank cleaning or de-ballasting operations, are deemed to present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea, and therefore justify a limitation on the quality and quantity of the discharge into the marine environment.

Category Z: Noxious liquid substances that, if discharged into the sea from tank cleaning or de-ballasting operations, are deemed to present a minor hazard to either marine resources or human health, and therefore justify less stringent restrictions on the quality and quantity of the discharge into the marine environment.

Chemicals have varying physical properties, which mean they behave differently once spilt. Noxious liquid substances can be divided into four major categories:

Evaporators: volatile liquids that are less dense than sea water;

Floaters: volatile liquids that are less dense than sea water;

Sinkers: products that are more dense than sea water; and

Dissolvers: products that are soluble in sea water.

Other Substances: Substances indicated as OS (Other Substances) in the pollution category column of chapter 18 of the IBC code that have been evaluated and found to fall outside Category X, Y or Z as defined in regulation 6.1 because they are, at present, considered to present no harm to marine resources, human health, amenities or other legitimate uses of the sea when discharged into the sea from tank cleaning or de-ballasting operations. The discharge of bilge or ballast water or other residues or mixtures containing only substances referred to as 'Other Substances' shall not be subject to any requirements of the Annex.

Where it is proposed to carry a liquid substance in bulk that has not been categorised under one of the above categories, the governments of parties to the Convention involved in the proposed operation shall establish and agree on a provisional assessment for the proposed operation. Until full agreement among the governments involved is reached, the substance shall not be carried. After the agreement has been reached, the government of the producing or shipping country, initiating the agreement concerned, shall notify the IMO and provide details of the substance and the provisional assessment for annual circulation to all parties for their information. The IMO maintains a register of all such substances and their provisional assessments until such time as the substances are formally included in the IBC code.

As Annex II deals with a variety of products, all of which present different hazards, even low doses of chemicals can produce sublethal effects to marine ecosystems over the longer term. Although major effects are more likely following large-scale spills, it is possible that the effect of continual small discharges in a limited area may cause changes to the marine environment, for example, in salinity and oxygen content.

Operations

The IBC code provides an international standard for the safe carriage, in bulk by sea, of the dangerous chemicals and noxious liquid substances listed in chapter 17 of the code. The code prescribes the design and construction standards of ships, regardless of tonnage, and the equipment they shall carry to minimise the risk to the ship, its crew and the environment, having regard to the nature of the products involved.

Types of chemical tankers

The basic philosophy of the code is to assign each chemical tanker one of three ship types according to the degree of the hazards of the products carried by such ships. Each of the products may have one or more hazardous properties, including flammability, toxicity, corrosivity and reactivity, as well as the hazard they may present to the environment.

A 'Type 1' chemical tanker is intended for the transportation of products considered to present the greatest overall hazard, and 'Type 2' and 'Type 3' tankers are intended for products of progressively lesser hazards. Accordingly, a 'Type 1' ship must survive the most severe damage and its cargo tanks shall be located at the maximum prescribed distance inboard from the shell plating.

Pumping and piping arrangements

Appreciating the diverse nature of the trade and the fact that different chemicals have different discharge criteria, every chemical tanker is provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of NLS does not retain a quantity of residue in excess of the quantity prescribed in regulation 12 of the Annex. This quantity depends on the age of the ship and the type of cargo that particular tank is certified to carry. A performance test is required to be carried out by the administration in accordance with appendix 5 of the Annex.

MARPOL Annex II – preserving the marine ecosystem is imperative continued

Ships certified to carry substances of Category X, Y or Z shall have an underwater discharge outlet, except for those certified to carry Category Z cargo only, which were constructed before 1 January 2007.

Discharge of residue

Control of discharge of residues of NLS or ballast water, tank washings or other mixtures shall be in compliance with the requirements of regulation 13. It is imperative that the tanks are emptied to the full extent as prescribed in the code. Where the provisions allow the discharge of residues into the sea, the following discharge standards apply:

- The ship is proceeding en route at a speed of at least 7 knots for self-propelled ships or at least 4 knots for ships that are not self-propelled;
- The discharge is made below the waterline and the maximum designed discharge rate for underwater outlet(s) is not exceeded;
- The discharge is made at a distance of not less than 12 miles from the nearest land in a depth of water of not less than 25 metres.

- For ships constructed before 1 January 2007, the discharge of residue containing category Z substances or of those provisionally assessed as such, discharge below the waterline is not mandatory.

Unlike Annex I, the Antarctic area is the only special area under Annex II. Discharge of residue is prohibited in the Antarctic area as defined in regulation 13.

Ventilation procedures approved by the administration in accordance with appendix 7 may be used to remove any cargo residue. Any water subsequently introduced into the tank is regarded as clean and is not subject to the above discharge requirements.

Particular attention is to be given to the prewash requirements for the various categories of the NLS as described in regulation 13. Appropriate entries of these operations shall be made in the Cargo Record Book and endorsed by the surveyor approved or appointed by the contracting government.



Guidelines to ensure compliance with Annex II

1. The ships are designed, constructed and certified in accordance with the provisions of the IBC code and in accordance with the MARPOL regulations.
2. Cargoes are carried in accordance with the list available in the ship's International Pollution Prevention Certificate for the Carriage of noxious liquid substances in Bulk (NLS certificate).
3. Proper procedures in accordance with regulation 6 of the Annex are followed if the ship is scheduled to load a cargo not listed in the NLS certificate.
4. The ship has an up-to-date Procedures and Arrangements Manual (P&A manual) and Shipboard Marine Pollution Emergency Plan for noxious liquid substances (SMPEP) approved by the administration.
5. The cargo record book is maintained in accordance with regulation 15 and appendix 2 of the Annex.
6. Cargo unloading and stripping procedure shall be in accordance with appendix 4 of the Annex and a detailed plan is made for cargo loading and unloading, stripping, tank prewashing and tank washing requirements.
7. Checks are done on the pumping and stripping system on a periodical basis to confirm that the system is in good working order in accordance with the regulations and the age of the ship.
8. Prewash and ventilation requirements are met in accordance with appendices 6 and 7 of the Annex.
9. The material safety data sheets (MSDS) for each cargo are obtained prior to loading, and all persons involved are aware of the risks and hazards and the action they need to take in case of any exposure or spill.

Hazards associated with any NLS are listed in the MSDS sheet. The IMO has standardised the information that is required on the MSDS sheets as per the MSC circular *MSC/Circ.1100* and MEPC circular *MEPC/Circ.407*.

Conclusion

There is a growing awareness of the need to develop procedures for the safe transport of chemicals and effective contingency planning to deal with a spill. There is a wide variety of chemicals with varying properties and hazards. It is vital to ensure that these cargoes are carried in a safe manner in accordance with the regulations. We recommend carrying out a risk assessment prior to carrying any NLS to determine its hazards and effects on the marine environment and human health in the event of a spill, and that members take proper actions to ensure that the ecosystem is not disturbed.