MARPOL Annex II – a new regime for the carriage of bulk chemicals and vegetable oils

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Regulations for the protection of the marine environment from Noxious Liquid Substances (NLS) – two main instruments

- **MARPOL Annex II – prevention of pollution**
  - Substances divided into categories according to the level of threat they pose to the marine environment
  - Conditions laid down under which discharge into the sea can take place

- **IBC Code – Safety**
  - Prescribes design and construction standards for ships
  - Definitive source of the names of products that have been evaluated for the carriage by sea
What are noxious liquid substances?

- Can be any bulk liquid that does not meet the definition for oil as defined in MARPOL Annex I

  Might include, inter alia:
  - petrochemicals
  - solvents
  - waxes
  - lube oil additives
  - vegetable oils and animal fats
(Courtesy of Odfjell Tankers)

**Chemical tankers trading routes**
Regulations of Noxious Liquid Substances (NLS) – two main instruments

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MARPOL Annex II

- Substances divided into pollution categories according to the level of threat they pose the environment
- Conditions established for each pollution category under which discharge into sea is permitted
- “Stripping Limits” defined for each pollution category
- Procedures and Arrangements (P and A) Manuals
- Cargo record book
- Entered into force 6 April 1987

HOWEVER......?
By the time of entry into force the provisions of Annex II were already 14 years old…….
soon recognised that the document was rather unwieldy

suggestions that editorial revision necessary in order to make document more user-friendly
Technological Advances

Developments in pump design and technology made it possible to consider much stricter controls on the amount of residues that can be discharged into the marine environment (stripping limits)
Advances in knowledge on marine pollution meant that it was becoming clear that properties not previously considered in the categorization of products should be given more weight while others were perhaps not so important as had been thought.
Changing Attitudes

Public expectations in terms of:

- Protection of ecosystems
- Provision of healthy, uncontaminated food
- Clean seas for recreational purposes
Exacerbated by incidents of lyophilic substances washing up on beaches and oiling sea birds
The revised MARPOL Annex II was adopted by resolution MEPC.118(52) in October 2004.

The amended IBC Code was adopted by resolution MEPC.119(52) in October 2004 and MSC.176(79) in December 2004.

Both entered into force on 01 January 2007.
WHAT IS MARPOL Annex II?

- Aimed at pollution created as a result of ship’s operational practices and covers the pollution and operational disposal of Noxious liquid substances.

- Applicable to all vessels irrespective of date of build or size carrying cargoes listed in chapter 17, 18 of the IBC Code which have been given the pollution category X, Y, Z.

- Noxious liquid substances are divided into pollution categories (X, Y, Z) according to the level of threat they pose the environment.

- Conditions established for each pollution category under which discharge into sea is permitted.

- “Stripping Limits” defined for each pollution category.

- Procedures and Arrangements (P and A) Manuals.

- Cargo record book.
ALL VESSELS – WHAT SHIPS?

- All ships carrying bulk NLS or those provisional assessed under Tripartite agreements
- All chemical tankers carrying dangerous substances in bulk
- Liquid Petroleum Gas Tankers carrying hazardous in bulk
- All oil tankers carrying pollution hazardous substances in bulk
Substances are divided into pollution categories according to the level of threat they pose the environment.

- **Pollution Categorization System**
  - **Category X**
    - Major Hazard – prohibition of discharge into the environment
  - **Category Y**
    - Hazard – limitation on quality and quantity of discharge into environment
  - **Category Z**
    - Minor hazard – less stringent restrictions on quality and quantity of discharge
  - **Other Substances (OS)**
    - Present no harm and not subject to any of the requirements of the Annex
Conditions established for each PC under which discharge into the sea is permitted

<table>
<thead>
<tr>
<th></th>
<th>All Prewash. Subsequent washings to be discharged under same conditions as Cat Y.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>High viscosity and Solidifying Substances Prewash, the rest efficient stripping</td>
</tr>
<tr>
<td></td>
<td>Proceeding en route at 7 knots; At least 12 miles from land; Depth of at least 25 m; Discharge below waterline</td>
</tr>
<tr>
<td>Y</td>
<td>All efficient stripping</td>
</tr>
<tr>
<td></td>
<td>Proceeding en route at 7 knots; At least 12 miles from land; Depth of at least 25 m; New Ships: Discharge below waterline</td>
</tr>
</tbody>
</table>
### Stripping Limits” defined for each pollution category

<table>
<thead>
<tr>
<th></th>
<th>New Ships</th>
<th>Existing IBC</th>
<th>Existing BCH</th>
<th>Other Ships</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>75 litres + prewash</td>
<td>100 litres + 50 litres tolerance +</td>
<td>100 litres + 50 litres tolerance +</td>
<td>No carriage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>prewash</td>
<td>prewash</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>75 litres</td>
<td>100 litres + 50 litres tolerance</td>
<td>300 litres + 50 litres tolerance</td>
<td>No carriage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>75 litres</td>
<td>300 litres + 50 litres tolerance</td>
<td>900 litres + 50 litres tolerance</td>
<td>New Ships: 75 litres</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Existing Ships: empty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tanks to the most</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>practicable extent</td>
</tr>
<tr>
<td>OS</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
</tr>
</tbody>
</table>
More on MARPOL Annex II

- Vessels must comply fully with parts of the Annex applicable to the Category of the pollutant carried:
  - Underwater discharge outlet (X, Y, Z – dependant on date of build)
  - Stripping Test (X, Y, Z.)
  - Approved procedures and arrangements manual (X, Y, Z)
  - Cargo record book (X, Y, Z)
  - Shipboard marine pollution emergency plan (X, Y, Z)
- Ventilation of cargo residues
- Use of cleaning agents/additives
- Special areas
- Slop tanks
Summary

- Entered into force 1 January 2007
- Editorial revision making it simpler to use
- Development of a new 4-pollution categories and criteria for assigning products to these criteria
- Revised conditions for each pollution category under which discharge into sea is permitted
- Defined stripping requirements for new ships – 75 litres
- Consequential amendments to the IBC code, in particular the criteria for ship typing
IBC Code

- International standard for the safe carriage by sea in bulk of dangerous and noxious liquid substances

- Mandatory under both SOLAS and MARPOL

- Defines the construction and equipment of ship carrying Dangerous Chemicals in Bulk
  - Divided into 21 chapters

- Applies to “ships, regardless of size, including those of less than 500 gt, engaged in the carriage of bulk cargoes of dangerous chemicals or noxious liquid substances (NLS), other than petroleum…”
IBC CODE

- Contains a set of basic requirements (19) all of which must be satisfied to some degree and a set of “Special Requirements” which are complied with at the Owners discretion.

- Compliance with the lowest level of the basic requirements will result in a vessel being restricted to carrying a few NLS

- By increasing the level of compliance and by complying with some of the “Special Requirements” the cargo list can be expended until at the highest level of compliance, all cargoes can be carried
Bigger tanks

Ship Type 1

More protection

Ship Type 2

Ship Type 3
Each tanker is assigned a ship type according to the degree of hazards of the products to be carried.

Chapter 17 of the Code lists those products which are subject to the Code, together with carriage requirements.

Chapter 18 contains products which have been evaluated and found not to present significant safety or pollution hazards.
<table>
<thead>
<tr>
<th>Type 3</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>Acetone</td>
</tr>
<tr>
<td>Ethyl acetate</td>
<td>Ethyl acetate</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>Ethyl alcohol</td>
</tr>
<tr>
<td>Ethylene glycol</td>
<td>Ethylene Glycol</td>
</tr>
<tr>
<td>Fatty acids</td>
<td>Fatty acids</td>
</tr>
<tr>
<td>Hexanol</td>
<td>Hexanol</td>
</tr>
<tr>
<td>Methyl alcohol</td>
<td>Methyl alcohol</td>
</tr>
<tr>
<td>Methyl ethyl ketone</td>
<td>Methyl ethyl ketone</td>
</tr>
<tr>
<td>Methyl isobutyl ketone</td>
<td>Methyl isobutyl ketone</td>
</tr>
<tr>
<td>MTBE</td>
<td>MTBE</td>
</tr>
<tr>
<td>Paraffin Wax</td>
<td>Paraffin wax</td>
</tr>
<tr>
<td>Urea/Ammonium</td>
<td>Urea Ammonium</td>
</tr>
<tr>
<td>Nitrate Solution</td>
<td>Nitrate solution</td>
</tr>
<tr>
<td>Vegetable oils</td>
<td>Vegetable oils</td>
</tr>
</tbody>
</table>
Summary

- Entered into Force 01 January 2007
- 4-Category system rather than 5-Category
- Number of cargoes not subject to discharge requirements reduced from 115 to a handful
- New ships must strip to 75 litres
- Need for special areas (other than Antarctic) eliminated
- Far greater number of products require carriage in chemical tankers than in the past provisions
- No longer provision for oil-like substances to be carried on vessels other than chemical tankers
- Name appearing in the IBC Code is the name that must be used in documentation
Carriage of vegetable oils

MARRPOL Annex II

And

IBC Code
Products used to be listed in Chapter 18 of the IBC Code as generic entries and not as individual products.

Full data did not need to be provided.
All vegetable oils and animal fats evaluated have resulted in an assignment of Pollution Category Y and Ship type 2.
HOWEVER, Ship Type 3 vessels will be allowed to carry vegetable oils providing they have double bottom and double sides and satisfy the operational criteria – Regulation 4.1.3 of MARPOL Annex II
Oleochemicals

- Pollution Category Y
- Ship Type 2
- Therefore not eligible for carriage under regulation 4.1.3
BIODIESEL
Fatty Acid Methyl Esters (m)

- Palm oil Fatty Acid Methyl Ester
- Coconut Oil Fatty Acid Methyl Ester
- Rapeseed Oil Fatty Acid Methyl Ester

(m) From vegetable oils specified in the IBC Code
Biofuel Blends
(first generation)

- Biodiesel blended with mineral diesel
- Bio-alchohol blended with gasoline (gasohol)
PROPOSED GUIDANCE FOR CARRIAGE OF BIOFUEL BLENDS CONSIDERED BY IMO

1. If the proportion of bioalcohol or biodiesel in the blend does not exceed 15% then carry it under MARPOL Annex I.

2. If the proportion of bioalcohol or biodiesel in the blend exceeds 15% then the shipper should contact his Administration for a decision on how the product is to be carried.
IMO´ RESPONSE TO THE ISSUE OF BIOFUELS/BIOFUEL BLENDS

1. IMO´s MEPC 55 agreed to add a new item to the work programme of the BLG Sub-Committee to deal with the carriage of biofuels and biofuel blends

2. IMO´s BLG Sub-Committee identified another issue that needs addressing within the context of biofuels i.e renewable diesel oil (second generation biofuels)
Responsibilities of Port States

Revised Annex II to MARPOL 73/78 and Amended IBC Code
Regional Arrangements

Guidelines for Ensuring the Adequacy of Port Reception Facilities (Resolution MEPC.83(44))
Port State Control
Questions?