Status of revised MARPOL Annex II and Chem Code.

Consequences for New and Existing Tankers

Vlaardingen, 2004-11-24
Antwerp, 2004-11-25

Otto Nyquist

Cargo Handling, Piping Systems & MARPOL

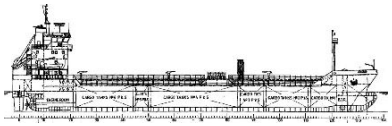
Otto Nyquist, Senior Principal Surveyor

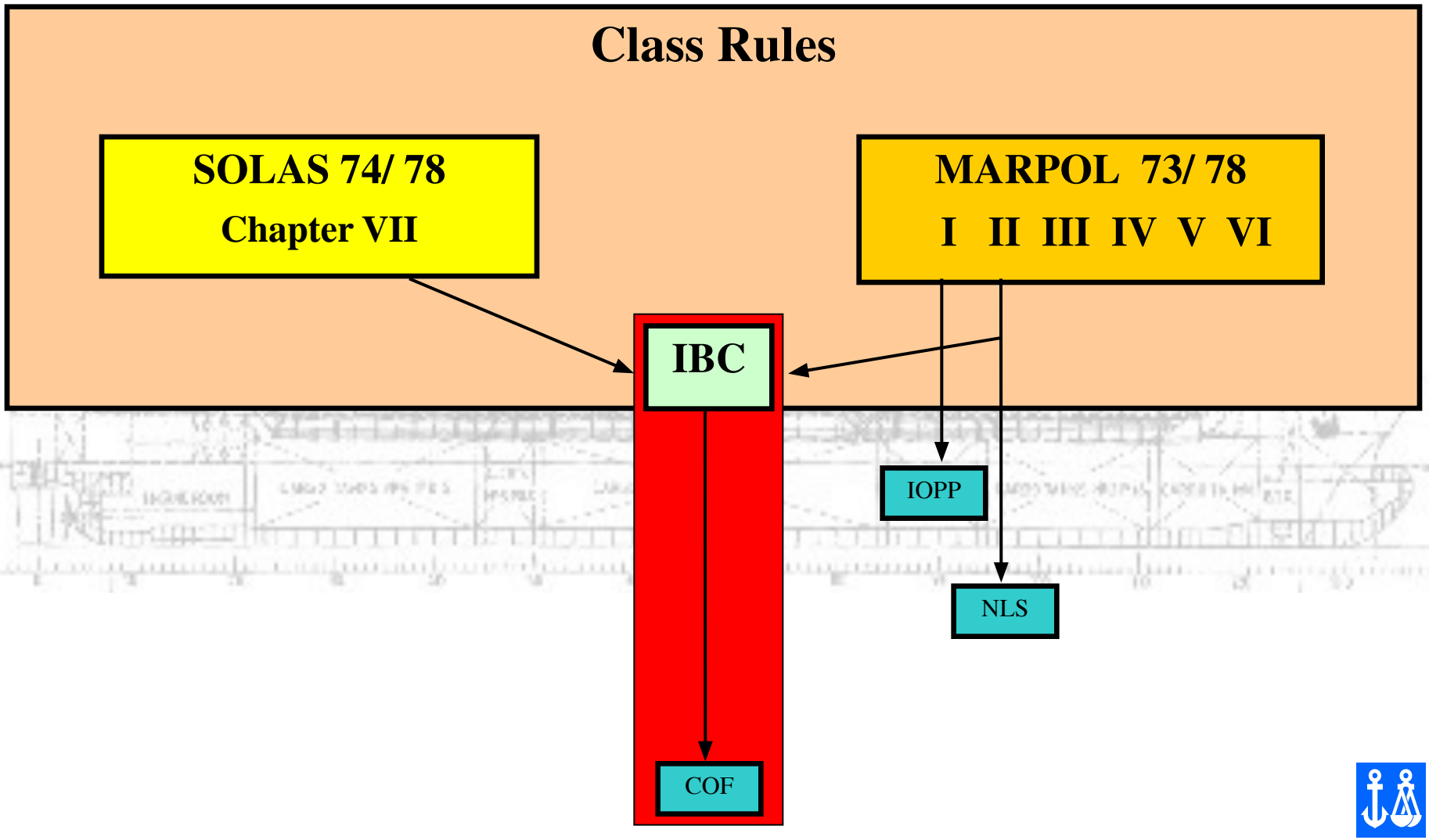
- Oil and Chemical Carriers

  Arrangement and Piping:

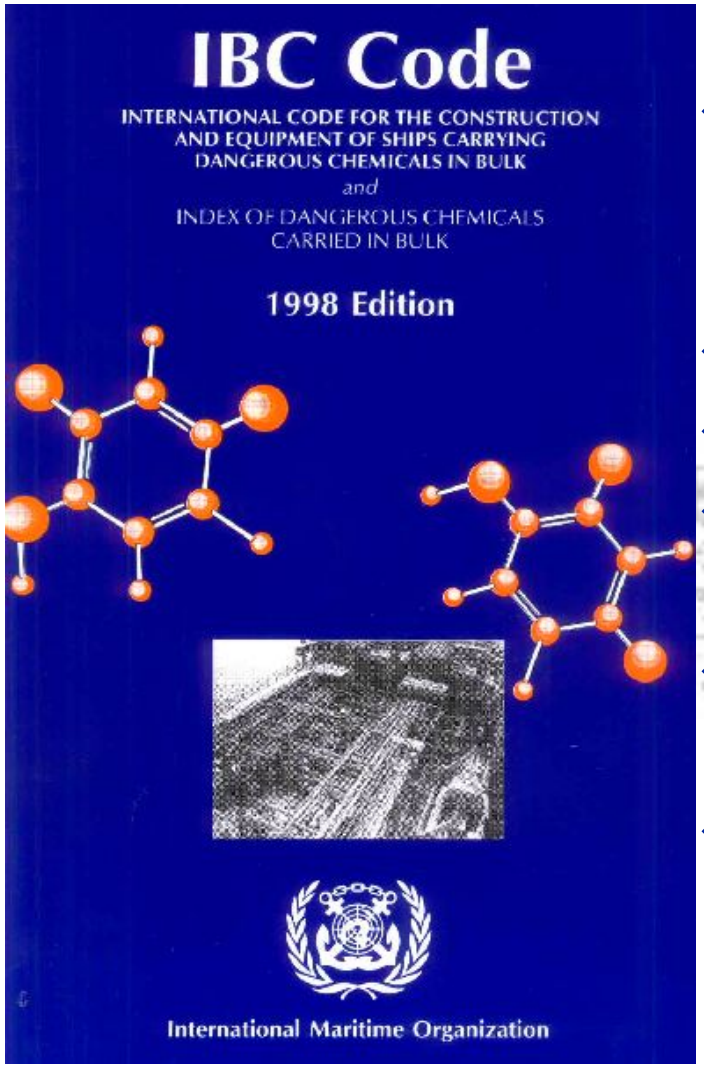
  – Approval of new-buildings for Oil and Chemical tankers.
  – Support and Issuance of Certificates and cargo lists for new and existing ships.
  – Representative in IMO BLG / ESPH WG
  – 4-5 persons.

Chemical Tankers
IBC Code, SOLAS & MARPOL





IBC Code

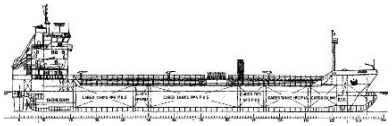


Application

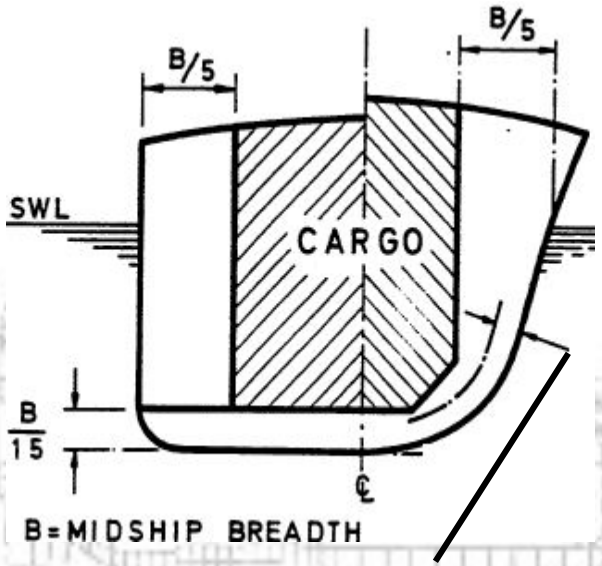
- All Ships carrying liquid cargoes other than oil, having safety hazards (greater than or additional to those of oil) and / or are of pollution category A, B or C
- N.A. for petroleum or similar products
- Relevant products are listed in chapter 17
- Products to which the IBC Code does not apply, are listed in Chapter 18
- New products to be evaluated by flag state or port state before carriage
- Liquids having vapour pressure≤ 2,8 bar at 37,8 ºC

Otto Nyquist

Ship survival capability & location of cargo tanks

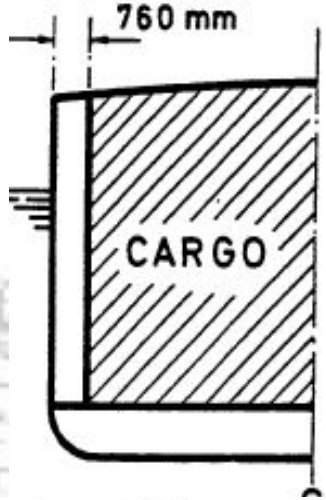


Ship type 1

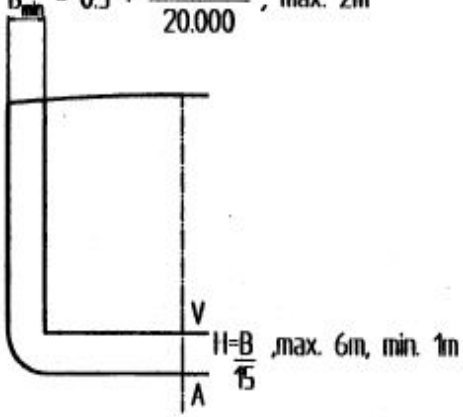


DISTANCE NOWHERE
LESS THEN 760 MM

Ship type 2



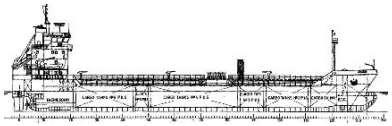
$B_{min} = 0.5 + \frac{DW}{20.000}$, max. 2m



Ship type 3

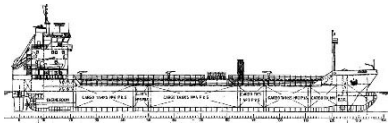
Tanker for Chemicals (ST 2) and Oil, DWT > 5000

Cargo types/ Rules & Regulations



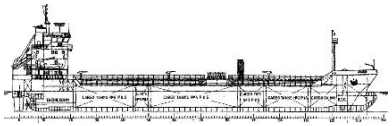
Safety Hazards	S&P Hazards	Pollution Hazards Cat. A, B, C	Poll. Haz. Cat. D, FP<60	Poll. Haz. Cat. D, FP>60	No Poll. Hazard FP<60	No Poll. Hazard FP>60
IBC cargoes (Ch. 17 IBC)			**NON- IBC cargoes** (Ch. 18 IBC)			
-			SOLAS (Tanker)	-	SOLAS (Tanker)	-
Certificate of Fitness			NLS Certificate (If not included in COF)		-	
• Acetonitrile • Methyl formate • Phosphoric acid	• Benzene • Creosote • Phenol • Sulphuric acid	• Diphenyl ether • Toluene • White spirit	• Methyl alcohol	• Animal oil • Vegetable oil	• Ethyl alcohol	• Molasses • Glycerin

Oil like substances



- Oil like substances of Category **C or D** in **MARPOL Annex II Reg. 14** may alternatively be carried on Oil tankers, when:
  - Ship complies with **Annex I** as product carriers,
  - the **Oil content meter** is approved for the products and they are included in IOPP Certificate,
  - for **Category C** product ship complies with Ship type type 3 damage stability requirements.

CARGO SPECTRUM FOR CHEMICAL TANKERS AND OIL PRODUCTS TANKERS

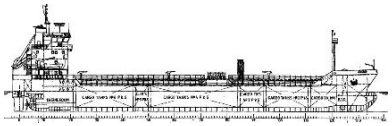


Chemical Tanker Domain

Oil Product Tanker Domain

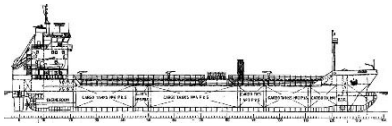
Crude Oil	Dirty Products	Clean Products	Unregulated Cargoes and Pollutants Cat.D	Oil-like Substances	Non-flammable chemicals	Chemicals
			Alcohols MTBE Veg. Oils Molasses …… UAN …… …… ……	Pentane Toluene Xylene ……	Caustic soda …… ……	

Oil & Chemical tankers in DNV



- Below 70000 DWT:
  - Tanker for Vegetable oil & Edible oil: 12
  - Tanker for Methanol: 1
  - Tanker for Oil and Caustic Soda: 19
  - Tanker for Oil Products: 72
  - Tanker for Oil: 447
  - Tanker for Oil and Chemicals: 283

ANALYSIS OF CARGO PARCELS BY PRODUCT TYPE IN CHEMICAL TANKERS



- Acid Inorganic 6.2%
- Acid Organic 0.7%
- Animal Oils and Fats 4.8%
- Caustic 11.6%
- Petrochemicals 35.1%
- Coconut Oil 7.5%
- Clean Petroleum Products 10.9%
- Dirty Petroleum Products 0.1%
- Drying Oils 0.6%
- Fish Oils 0.9%
- Liquid Fertilizers 0.7%
- Lubricating Oils & Additives 4.5%
- Mineral Spirits 3.5%
- Molasses 1.1%
- Other Specially Chemicals 0.6%
- Palm Kernal Oil 1.5%
- Palm Oils 4.5%
- Vegetable Oils 4.9%
- Waxes 0.3%

Revised

MARPOL Annex II and

Chem Code

AND THE CONSEQUENCES

To set the scene

MARPOL 73/78 has 6 Annexes

- Annex I Oil (cargo and engine room)
- Annex II NLS (i.e. all other liquids carried in bulk
- Annex III .....
- Annex IV .....
- Annex V .....
- Annex VI ..... (enters into force 19 May 2005)

To set the scene

Current Annex II has 5 Appendixes

- Appendix I Guidelines
- Appendix II Noxious Liquids A - B - C - D
- Appendix III Other (non-noxious) substances
- Appendix IV Cargo Record Book
- Appendix V NLS Certificate Form

5 Category system = A - B - C - D - III

Purpose of the revision

- Editorial improvements
- Adaptation to new GESAMP procedure
- Reduction of number of categories
- Simplification of operational requirements
- Fewer non-regulated substances
- Reduction of legal discharges
- Keeping up with technical development

Time schedule (expected)

- Approved for circulation: MEPC 51 (April 2004) (done)
- Formal adoption: MEPC 52 (15 October 2004) (done)
- Formal adoption of IBC Code by MSC 79: December 2004
- Tacit acceptance confirmed: 1 July 2006
- In force for all ships: **1 January 2007**

Nature of revised requirements: Operational requirements for the individual substances

Therefore:

- Applicable to all (both new and existing) ships
- Applicable from the set date
- Replaces current requirements (which remain in force until the set date)

Editorial updating

- Outdated text deleted
- Requirements of P & A Standards incorporated in Annex II regulations
- Requirements for P & A Manual clarified
- Stripping requirements clarified / formalised
- Simplification of requirements and procedures
- "Oil-Like" does no longer exist

Basis for assigning **Pollution Categories**

- GHS (Globally Harmonized System) for evaluation of Chemicals:
- New GESAMP Hazard Evaluation Procedure and Profile:
- Change from 5 to 4 Categories:
- New Guidelines for assigning Pollution Categories:
  - Most Cat. A become Cat. X
  - Most Cat. B + Cat. C become Cat. Y
  - Most Cat. D + App. III become Cat. Z
  - Some few App. III become OS
  - Almost all Ch. 17 or Ch. 18 products will require Chem Code CoF or NLS Certificate

Guidelines for assigning Pollution Categories

Rule	A1	A2	B1	B2	D3	E2	Cat
1			≥5				**X**
2	≥4		4				
3		NR	4				
4	≥4	NR			CMRTNI		
5			4				**Y**
6			3				
7			2				
8	≥4	NR		Not 0			
9				≥1			
10						Fp, F or S (if not inorganic)	
11					CMRTNI		
12	Any product not meeting the criteria of rules 1 to 11 and 13						**Z**
13	All products identified as: ≤2 in column A1; R in column A2; blank in column D3; not Fp, F or S (if not inorganic) in column E2; and 0 (zero) in all other columns of the GESAMP Hazard Profile						**OS**

Basis for assigning **Ship Types**

- GHS (Globally Harmonized System) for evaluation of Chemicals:
- New GESAMP Hazard Evaluation Procedure and Profile:
- New Criteria for assigning Ship Type for Pollution reasons:
  - (Revised) Ship Type requirements for Pollution reasons:
    - All X and Y gets a ST1, 2 or 3 according to table
    - All "Not readily biodegradable" = ST3
    - Persistent floaters = ST2
    - Bio accumulating at least ST3
  - Ship Type for Safety reasons not changed for existing products
  - Applicable Ship Type = most stringent of Pollution and Safety Ship Type

Ship Type for Pollution reasons

Rule Number	A1	A2	B1	B2	D3	E2	Ship Type
1			≥5				**1**
2	≥4	NR	4		CMRTNI		
3	≥4	NR			CMRTNI		**2**
4			4				
5	≥4		3				
6		NR	3				
7				≥1			
8						Fp	
9					CMRTNI	F	
10			≥2			S	
11	≥4						**3**
12		NR					
13			≥1				
14	All other Category Y Substances						
15	All other Category Z Substances All "Other Substances" (OS)						**NA**

New requirements for some "Big Movers"

Product name	Pollution Category		Ship Type	
	Current	**New** MEPC 52/ WP.11/Add.1	Current	**New** MEPC 52/ WP.11/Add.1
Benzene	C	**Y**	3	**3**
Coconut oil (<5% free fatty acid)	D	**Y**	N/A	**2(k)**
Dodecyl alcohol	B	**Y**	3	**2**
Ethanolamine	D	**Y**	3	**3**
Ethyl acetate	D	**Z**	N/A	**3**
Ethyl acrylate	A	**Y**	2	**2**
Ethyl alcohol	III	**Z**	N/A	**N/A**
Ethylbenzene	B	**Y**	3	**2**
Ethylene cyanohydrin	D	**Y**	3	**3**
Ethylenediamine	C	**Y**	2	**2**
Ethylene dichloride	B	**Y**	2	**2**
Ethylene glycol	D	**Y**	N/A	**3**
Fatty acid (saturated C13+)	III	**Y**	N/A	**2**
Formic acid	D	**Y**	3	**3**
Furfural	C	**Y**	3	**3**
Furfuryl alcohol	C	**Y**	3	**3**
Heptene (all isomers)	C	**Y**	3	**3**
Hexamethylenediamine solution	C	**Y**	3	**3**
Hexane (all isomers)	C	**Y**	3	**2**
Hexanol	D	**Y**	N/A	**3**
Hexene (all isomers)	C	**Y**	3	**3**

NED = Not Enough Data

Product name	Pollution Category		Ship Type	
	Current	New MEPC 52/ WP.11/Add.1	Current	New MEPC 52/ WP.11/Add.1
Isopropyl alcohol	III	**Z**	N/A	**N/A**
Methyl alcohol	D	**Y**	N/A	**3**
Methyl *tert*-butyl ether	D	**Z**	N/A	**3**
Methyl ethyl ketone	III	**Z**	N/A	**3**
Methyl isobutyl ketone	D	**Z**	N/A	**3**
Methyl methacrylate	D	**Y**	2	**2**
Molasses	III	**OS**	N/A	**N/A**
Nonene (all isomers)	B	**Y**	3	**2**
Octanol (all isomers)	C	**Y**	3	**2**
Olefin mixtures (C5-C7)	C	**NED**	3	**NED**
Olefin mixtures (C5-C15)	B	**NED**	3	**NED**
Olefins (C13+, all isomers)	III	**Y**	N/A	**2**
Palm kernel oil (<5% free fatty acid)		**Y**		**2(k)**
Palm oil (<5% free fatty acid)	D	**Y**	N/A	**2(k)**
Palm olein (<5% free fatty acid)	D	**Y**	N/A	**2(k)**
Palm stearin (<5% free fatty acid)	D	**Y**	N/A	**2(k)**
Paraffin wax	III	**Y**	N/A	**2**
Pentene (all isomers)	C	**Y**	3	**3**
Perchloroethylene	B	**Y**	3	**2**
Phenol	C	**Y**	2	**2**
Phosphoric acid	D	**Z**	3	**3**
Pine oil NED = Not Enough Data	C	**X**	3	**2**

NED = Not Enough Data

Product name	Pollution Category		Ship Type	
	Current	New MEPC 52/ WP.11/Add.1	Current	New MEPC 52/ WP.11/Add.1
Potassium hydroxide solution	C	Y	3	3
Propylbenzene (all isomers)	A	Y	3	3
Propylene glycol	III	Z	N/A	N/A
Pyrolysis gasoline	B	NED	3	NED
Rapeseed oil (low erucic acid, < 4% free fatty acids)	D	Y	N/A	2(k)
Sodium hydroxide solution	D	Y	3	3
Soyabean oil (<0.5% free fatty acid)	D	Y	N/A	2(k)
Styrene monomer	B	NED (Y)	3	NED (3)
Sulphuric acid	C	Y	3	3
Sunflowerseed oil (< 7% free fatty acid)	D	Y	N/A	2(k)
Tall oil	B	NED	3	NED
Tallow (< 15% free fatty acid)	D	Y	N/A	2(k)
Tetrahydrofuran	D	Z	3	3
Toluene	C	Y	3	3
Toluene diisocyanate	C	Y	2	2
Trichloroethylene	C	Y	3	2
Triethanolamine	D	Z	3	3
Urea/Ammonium nitrate solution	D	Z	N/A	3
Urea solution	III	Y	N/A	3
Vinyl acetate	C	Y	3	3
Xylenes	C	Y	3	2

NED = Not Enough Data

"Other substances" - OS

- Apple Juice
- Clay Slurry
- Coal Slurry
- Glucose solution
- Kaolin slurry
- Molasses
- Water

Revised Stripping requirements

- All Chem / NLS tankers keel-laid after 2007-01-01;
  75 litres for XYZ (no tolerance)
- Existing IBC ships; 150 litres for XY (incl. 50 l tolerance)
  350 litres for Z (incl. 50 l tolerance)
- BCH ships: 350 litres for XY (incl. 50 l tolerance)
  950 litres for Z (incl. 50 l tolerance)
- Existing ships with NLS Cert.: Strip as good as possible
- Existing caustic soda tankers: Upgrade according to Category Y and age.

Revised Discharge Requirements

- No more **Special Areas** (except Antarctic maintained)
- High viscosity limit 50 mPa·s for all areas
- Prewash required for all Cat. X substances and for Cat. Y substances if high viscosity or solidifying
- Underwater outlet required for:
  XYZ for ships keel laid on or after 1 Jan. 2007
  XY for older ships

Consequences

- Many more products required to be carried by chemical tankers; (Ship Type 1, 2 or 3)
- Veg. oils are now Category Y and Ship Type 2
  - To be carried only under individual names
- Methanol is Category Y Ship Type 3
- MTBE is Category Z Ship Type 3
- Caustic Soda is Category Y Ship Type 3
- "Oil-Like" disappears from product tankers
  - Toluene is Category Y Ship Type 3
  - Xylenes is Category Y Ship Type 2
- UAN is Category Z Ship Type 3

Waiver possible for Veg Oils

- Ship Type 3 damaged stability (rather than 2) required
- Quantity limitation of 3 000 m^3 not enforced
- Double skin tanks required
- Stripping capability for Category Y required
- Normal operational requirements to be applied
- Use of *Waiver Clause* to be specifically authorised by Flag Administration

- Existing dry cargo ships with deeptanks / independent tanks may continue carriage of veg oils in specific trades

IBC Code Changes

- Editorial to match Annex II
- Revised electrical requirements based on new IEC standard
- Materials requirements made operational / data base not maintained by IMO

NEW CARGO SPECTRUM FOR CHEMICAL TANKERS AND OIL PRODUCTS TANKERS

Chemical Tanker Domain

Oil Product Tanker Domain

Crude Oil	*Dirty Products*	*Clean Products*	*Other Substances Cat. Z/Ch. 18*	~~*Oil-like Substances*~~	*Non-flammable chemicals*	*Chemicals*

Ethyl alcohol ..... Molasses .... Caustic soda ..... UAN .... Benzene Methyl alcohol MTBE Toluene Veg. Oils

MANAGING RISK

Consequences for Owners / Operators

- **COMMERCIAL EFFECTS**
- Training of shore staff and crew members
- Update commodity books / product information
- Updating of or new P & A Manuals
- New Certificates and Addenda
- Revise Charter Agreements?????
- **Neither Certificate / Nor Carriage for products not GESAMP'd**
- **Keep an eye on "your" cargoes**

Consequences for Administrations / Class Societies on behalf of Adm.

- Update software
- Train surveyors / HO staff
- Approve updated / new P & A Manuals for all ships
- Issue New Chem Code CoF (all ships)
- Issue New Addenda
- Issue New NLS Certificates (all ships)
- Increased need for reception facilities

Likely problems

- Backlog with P & A Manuals and Certificates
- Transition from old to new Annex II
- New-building contracts
- Training of Terminal and Port State inspectors
- Availability of Reception Facilities
- Producers / Shippers / Brokers etc.
- Interpretations to be developed
- Don't complicate the transition process with Change of Flag / Change of Class

REPEAT / SUMMARY

- Effective date: 2007-01-01
- Affects all liquid bulk cargoes except oils and OS
- No carriage unless the substance has been GESAMP'd
- All ships need new P & A Manuals
- All ships need new Certificate
- Sophisticated chemical tankers will maintain their product range subject to documentation requirements
- Simple chemcial tankers may loose a large portion of their product range
- Tankers with NLS Certificate will loose most of their product range unless upgraded
- Carriage of "oil-like" substances by oil tankers will be terminated


DNV