



**EMSA BALLAST WATER WORKSHOP (13-14 November 2013)**

# **The hurdles to embracing the Ballast Water Management Convention**

**ROYAL BELGIAN SHIPOWNERS ASSOCIATION**

□ **LUDOVIC LAFFINEUR (ENVIRONMENTAL POLICY ADVISOR)**

# Royal Belgian Shipowners Association (RBSA)



## **MISSION :**

- ❑ Protect common interests of all shipowners and ships' managers established in Belgium.
- ❑ Promotion of the sector as attractive employer
- ❑ Operational support and clarification concerning:
  - fiscal
  - social
  - **environmental**
  - and maritime legislation.
- ❑ Close cooperation with all relevant national and international parties.

**VISION :** As Belgium's maritime knowledge centre, the RBSA hopes to play a pioneering role in the continuing expansion and long-term growth of the sector of international maritime transport by sea. In its role of forward-looking opinion maker, the RBSA hopes to serve as the ideal discussion partner for all parties concerned.

# RBSA: 23 MEMBERS



## EXMAR

- TRANSPORT LNG WORLDWIDE
- MARKET LEADER AND TREND SETTER IN THE LPG MARKET
- **Will build first Sea-going LNG bunker vessel for the port of Antwerp !**



## DELPHIS

- MULTIMODAL CONTAINERTRANSPORT THROUGHOUT THE WORLD
- ONE OF THE STRONGEST PLAYERS IN **SHORT SEA SHIPPING**



## EURONAV

- TRANSPORT CRUDE OIL
- ONE OF THE WORLDS LEADING INDEPENDENT TANKER COMPANIES



## BOCIMAR

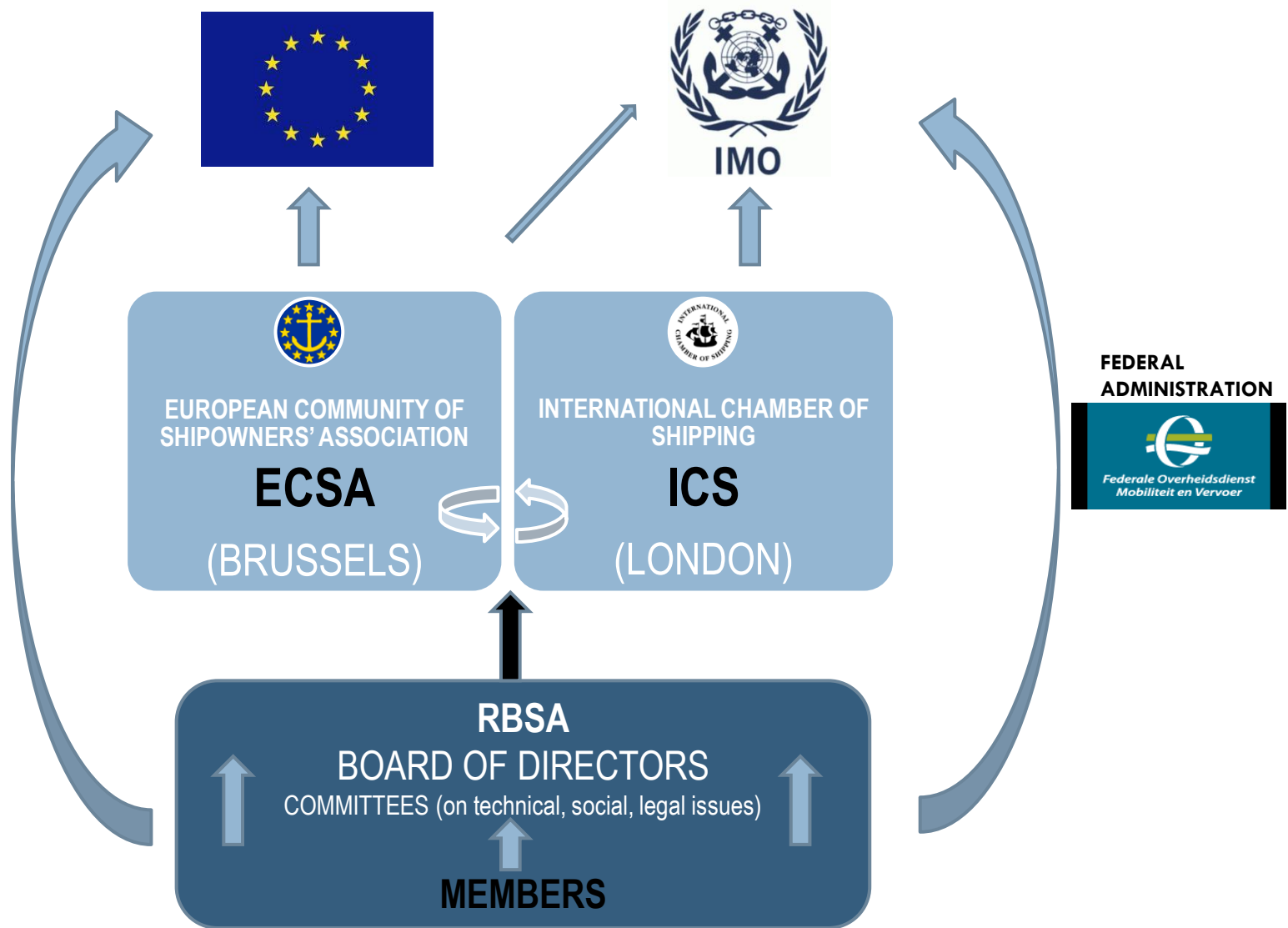
- TRANSPORT DRY BULK



## FASTLINES

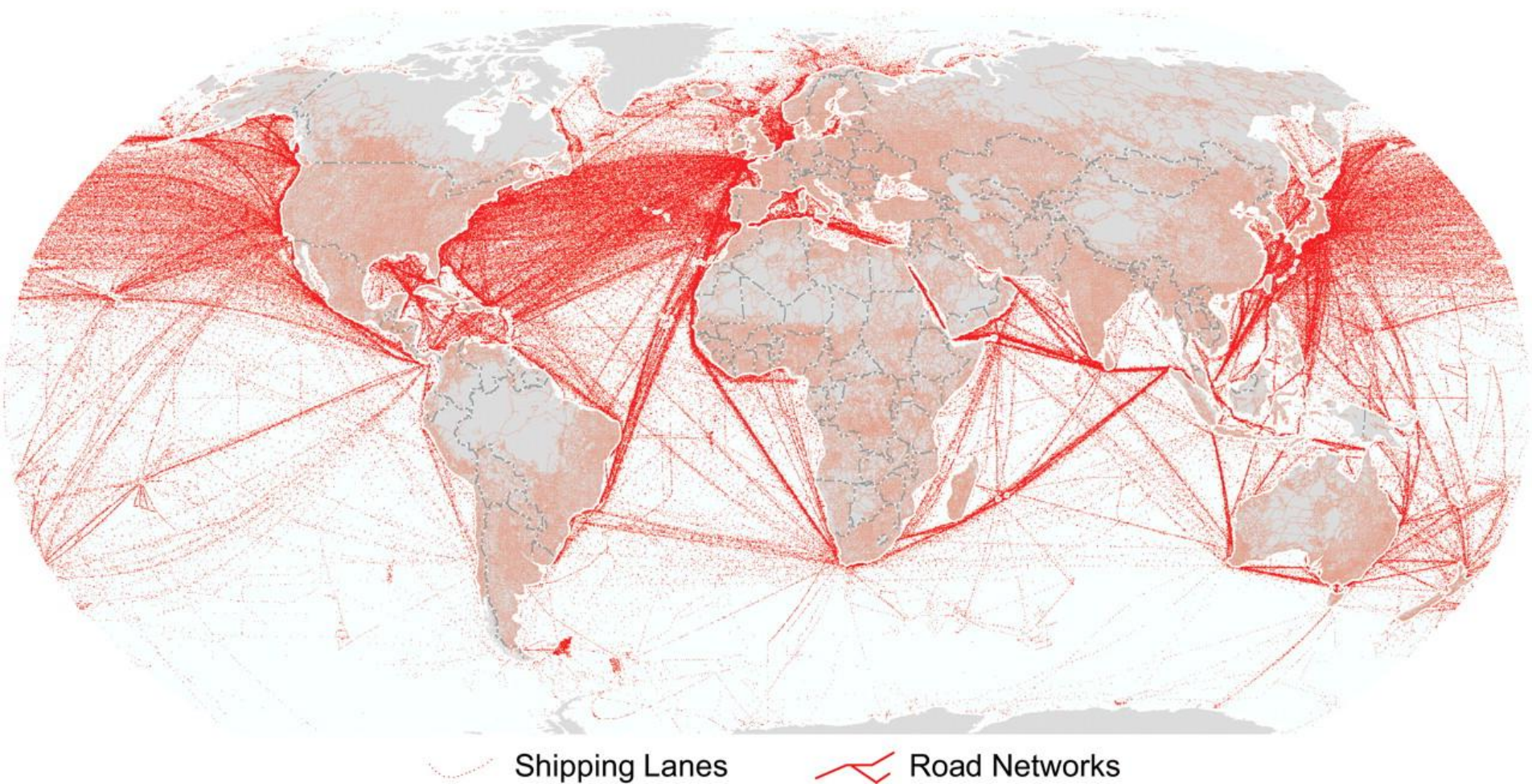
- GENERAL CARGO (**SHORT SEA SHIPPING**)
- TRADES IN BALTIC

# RBSA member of...



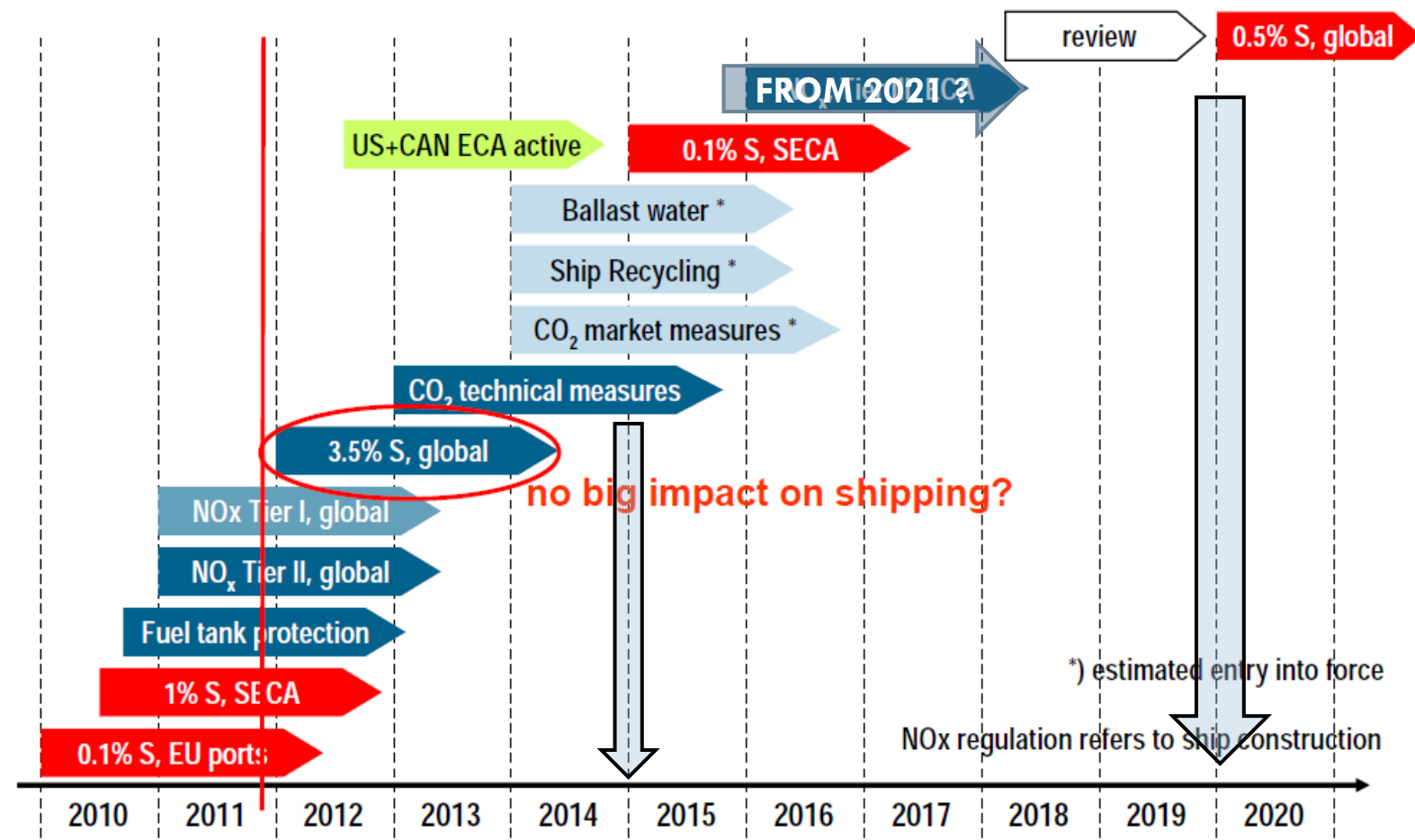


# **RBSA MEMBERS ACTIVE WORLDWIDE**



# NOT only the BWMC

## Overview and timeline for maritime environmental regulations



# RBSA TECHNICAL COMMITTEE

## □ WHO?

Higher Technical staff of our members.

## □ Topics on the agenda:

e.g:

- SCRUBBERS
- ENERGY-EFFICIENCY (NEW BUILD AND EXISTING SHIPS)
- FUEL QUALITY
- **BALLAST WATER**

members very pro-active :

- 2010 pros and cons of BWTS (presentation by members)
- questionnaire EMSA on installation of BWTS (almost all our members responded)
- draft resolution Japan with options

**A LOT OF RESOURCES OF OUR MEMBERS IN ANALYSING WHICH SYSTEM FITS THEIR FLEET/TRADE BEST.**

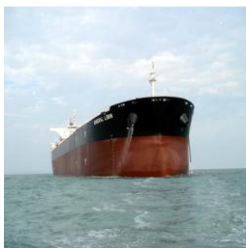
**(especially after the SEDNA / Peraclean system and Wilhemsen Solutions Unitor system failure)**

# DEEP SEA – SHORT SEA



ballast water - how to comply ?

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## DEEP SEA

- Often own technical department: Allows for shipowners to be prepared and to analyse which systems fit their fleet best. **Not an easy task as G8 guidelines are not comforting.**
- RBSA members trading to the US ! Sense of urgency high.



## SHORT SEA

- A lot off smaller short sea operators do not have a technical department
- More a wait and see approach.
- Sense of urgency less high (no trade to US)





# MEPC 65 : POSITIVE OUTCOME

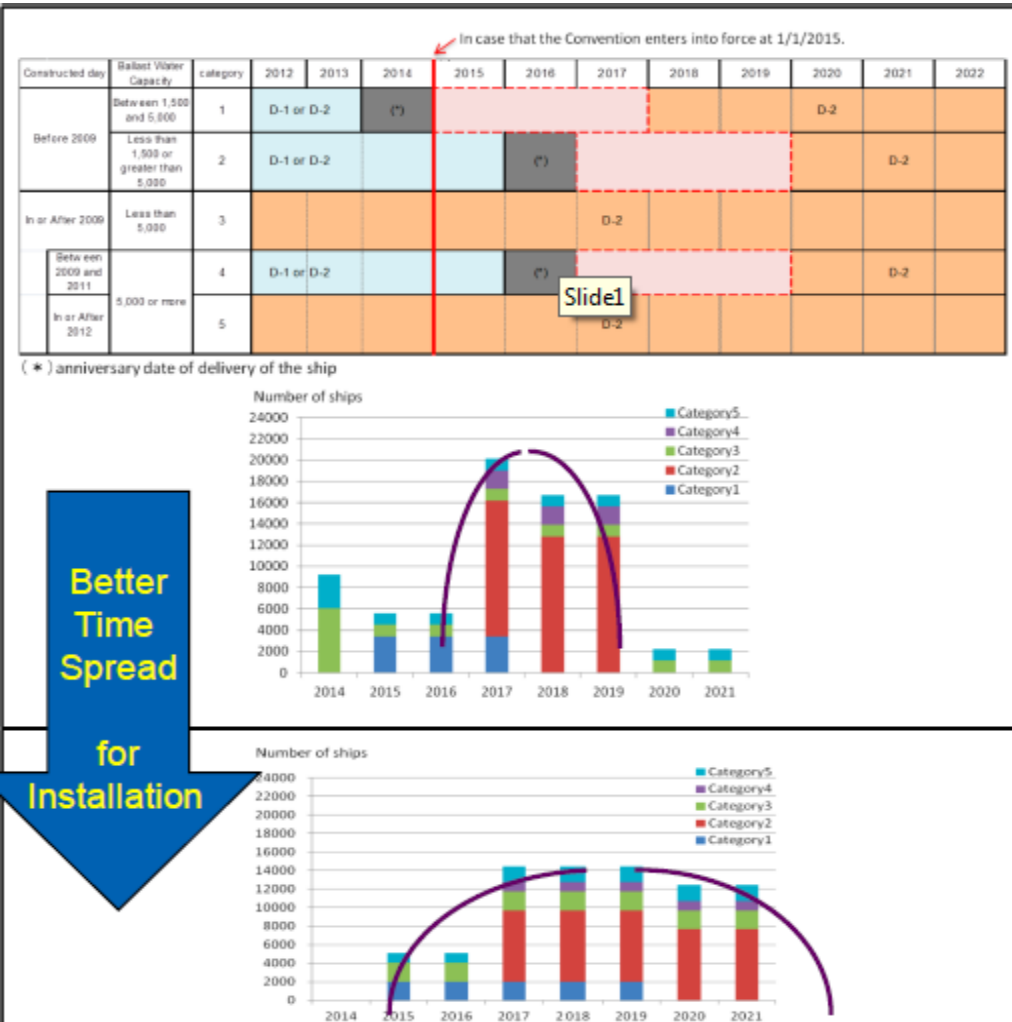


Pending outcome of the IMO Assembly (

## RELAXATION of the implementation schedule

For ships with a **capacity of ballast water tanks greater than 5000 m<sup>3</sup>**, the recommended time schedule is as follow:

- Vessels built before 2012, will not be required to install a ballast water treatment system until their first renewal survey following the anniversary date of delivery of the ship in the year of compliance (2016) or following the date of entry into force of the Convention (in case that it will become effective after 2016).
- Vessels built after 2012, will be required to install a ballast water treatment system by their first renewal survey (for the IOPP certificate) following the entry into force of the Convention.



# BALLAST WATER TANK CAPACITY WORLD FLEET

Sub Type	Count	Ballast capacity of <1500m <sup>3</sup>	Ballast capacity of 1500–5000m <sup>3</sup>	Ballast capacity of >5000m <sup>3</sup>
Barges	574	0	0	574
Bulk Carriers	8,110	0	0	8,110
Container Ship	4,724	0	0	4,724
Crude Oil Tanker	2,160	0	0	2,160
Chemical Tanker	1,474	0	0	1,474
Chemical/Oil Products Tanker	9,323	0	0	9,323
General Cargo Ship	18,187	0	16,535	1,652
Fishing Vessels	8,001	7,970	30	1
LNG Tanker	327	0	0	327
LPG Tanker	1,194	540	0	654
OSVs	2,000	1,923	0	77
Passenger (Cruise) Ship	515	0	479	36
Passenger-Passenger/Cargo (Ro-Ro)	3,359	3,324	35	0
Passenger Ship	2,942	2,941	1	0
Refrigerated Cargo Ship	2,542	0	2,538	4
Ro-Ro Cargo Ship	1,873	0	1,700	173
Livestock Carrier	101	0	90	11
Vehicle Carrier	784	0	196	588
<b>TOTAL</b>	<b>68,190</b>	<b>16,698</b>	<b>21,604</b>	<b>29,888</b>

# BALLAST WATER : RESOLUTION

## ANALYSIS (from one of our members):

Options A, B and C are reflecting the legal form of the adoption, whereas sub-options A-1 to A-4 are reflecting the new implementation proposals

### Option A-1: Reschedule for ships constructed before the entry into force of the Convention

- Could remove the motivation to install BWMS on new-builds delivered as from 2012 and onwards up to ratification. These new-builds may therefore become retrofits and consequently burden the retrofit pressure even more.

### Option A-2: Reschedule only for ships constructed before 2012

- Keeps new-builds out of the equation and as such helps relieve the pressure on the retrofiting.  
Furthermore keeps BWMS-suppliers presently in business on new-builds, as such assuring a further development in available technologies.

➡ **less conservative than what was opted for at MEPC 65.**

### Option A-3: Reschedule only for ships constructed before 2009

- Comparable to option A-2, but allows 2 years less for compliance for cat.4 (BW capacity >5000, built 2009-11) vessels. 2 years less for evolutions on available technologies as well.

### Option A-4: Cut-off year of 2019 for ease of implementation

- Concentrates all installation workloads on the 2017-2019 period. Thus does not meet the purpose.

# RBBSA DEEP-SEA MEMBERS



- ❑ Are starting to be prepared for ships build after 2012
- ❑ Prime focus:

“We need to make sure that our ships comply to the highest level in all circumstances to avoid penalties ”.

**(PANIC after SEDNA / Peraclean system and Wilhemsen Solutions Unitor system failure)**

As of today (14/11/13)

RBBSA members have ordered 23 systems for ships with a ballast water capacity above 5000m<sup>3</sup> **BUILD AFTER 2012**

(All of the systems have a filter !)

PRICE (example):

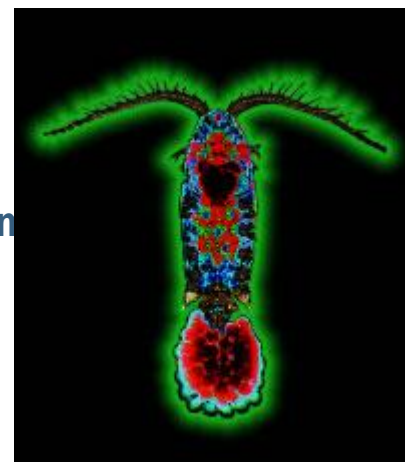
- ship capacity 38000 DWT, ballast tank capacity 12000m<sup>3</sup>, pump rate 1000m<sup>3</sup>/h = **800.000 \$** (without installation cost)
- Ship capacity 180.000 DWT, pump rate 2 x 3000 m<sup>3</sup>/h = **2.200.000 \$** (without installation cost = 100.000 \$)

**Filter about 30% of CAPEX**

# Main criteria for BWMS selection

PRIOR TO MAKING THE ORDERS

- ❑ Approval by IMO (final, type)
- ❑ Chance to be approved by US authorities (no system approved so far, guesswork)
- ❑ Footprint and weight
- ❑ IMPACT ON CORROSION and interaction with coatings in ballast pipes and tanks
- ❑ Electrical power consumption
- ❑ Possibility to work in fresh, brackish and sea water !!!
- ❑ Costs of initial installation
- ❑ Operational costs
- ❑ Amount of pumps used for ballasting and de-ballasting
- ❑ Minimal duration of voyage (to ensure proper work of the system)
- ❑ Safety of crew and stevedores
- ❑ Easiness for operation by the crew
- ❑ Filters – types, size, flow capacity, maintenance costs.
- ❑ Required changes in total head of ballast pumps
- ❑ Pressure in pipeline system
- ❑ ....



# EXAMPLE (RBSA MEMBER BWTS ANALYSIS Q1 2012, outdated)

(180,000 DWT) – 2 x 3000 m³/h



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System	Treatment (bal./ deb.)	El. power	Press. drop (filter) (bar)	Press. drop (system) (bar)	Footprint (m²)	Weight (T)	Main problems
UNITOR	ballasting	90	0.1	0.5	13	18.8	Filters on pumps' suction
RWO	Bal./deb.	600	0.8	0.6	40	57	Filters size, power, price
NEI	Bal./deb.	240	N/A	1.4	12.5	7 (gen.)	Safety, CO2 emission, fuel cost, complicated Instal.
Quingdao Headway	Bal./deb.	300	0.3	0.7	8	13	Not known maker, price
OceanSaver	Bal./deb.	800	0.3	3.5	30	43	Complicated, back-pressure, power, pressure in system, size
OceanSaver 2	ballasting	600	0.3	N/A			New(?) system – performances (?)
Optimarin	Bal./deb.	1350	0.5	0.5	28	45	Power, footprint, weight
Hyde Guardian	Bal./deb.	684	0.7	0.1	62.6 filters +lamps	24	Power, footprint of filters and lamps
Techcross	Ballasting	690	N/A	0.2		10	Corrosion, coating, brackish water perf.
Ecochlor	Ballasting	40	0.5	N/A	7.5		Storage of chemicals, safety, operation costs
Alfa Laval	Ball./deb.	864	0.3	0.4	23	22	Power, footprint



# PENDING ISSUES

1. **TYPE APPROVAL** (responsibility of flag states ! guidance from EMSA )
2. Installation of BWTS on **existing ships**
3. **EXEMPTIONS** for **SHORT SEA SHIPPING**
4. methodology **SAMPLING** during PSC inspections



# 1. TYPE APPROVAL

- “The Guidelines for approval of ballast water management systems (G8) were agreed prior to any practical knowledge of how a BWMS would operate, or what would be the practicalities for operation of a biologically efficient ballast water management system”.
- MEPC 65 did not produce an agreement to renew and revise the ballast water treatment system type approval guidelines (“G8 Guidelines”)

(relaxation of implementation schedule: workload for shipyards was the argument)

- **Fortunately**, BLG 17 agreed to recommend that Member States report additional information (e.g. results from all passing and failed land-based and shipboard tests, system salinity and temperature ranges) to the IMO when type approving ballast water management systems.



# TYPE APPROVAL: LEARNING CURVE

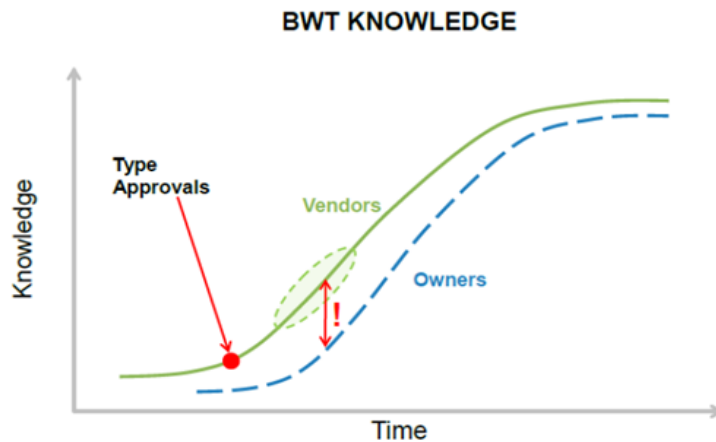


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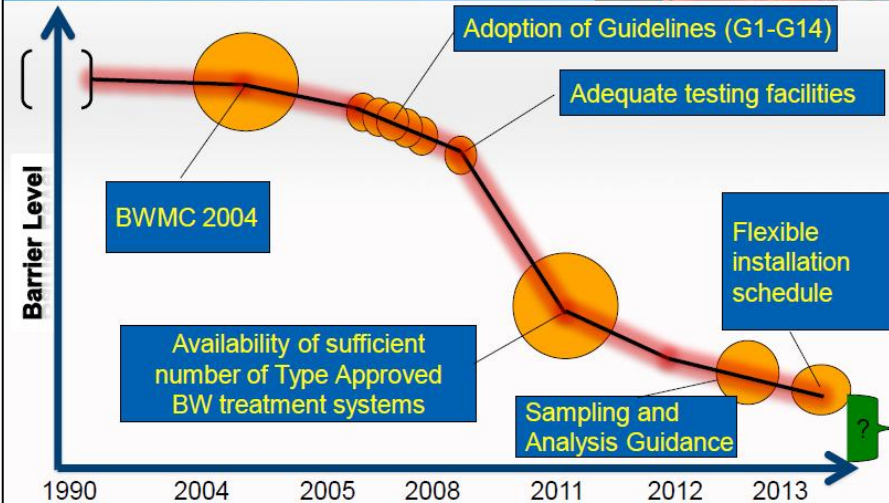
EXMAR

## LEARNING CURVE



TA : "too early, too weak"

## Removal of Barriers In Addressing Ballast Water Issues



IMO  
INTERNATIONAL  
MARITIME  
ORGANIZATION

# TYPE APPROVAL

ICS submission MEPC 64/2/17 (in response to its members concern on the type approval standard):

## Consideration of amending the G8 guidelines for approval of ballast water management systems

- a) Testing should be performed using **fresh, brackish and marine waters (FULL Spectrum)**
- b) Testing should also consider the **effect of temperature in cold and tropical water** on operational effectiveness and environmental acceptability.
- c) **Suspended solids** in test water should provide a more realistic challenge than at present, levels of clay silt and the content of total suspended solids (TTS) in the test water should be increased.
- d) The TA testing should not allow discounting test runs in the full scale testing that do not meet the D-2 standard, nor should the results of test runs be 'averaged'; **if a system under test fails the treatment efficacy requirements at any time, then it should not be granted TA.**
- e) TA testing should **realistically represent the flow rates** the system is approved for.



# FORTUNATELY AFTER MEPC 65 MORE GUIDANCE TO ADMINISTRATIONS

BWM.2/Circ.43

## ANNEX 1

### AMENDMENTS TO THE GUIDANCE FOR ADMINISTRATIONS ON THE TYPE APPROVAL PROCESS FOR BALLAST WATER MANAGEMENT SYSTEMS IN ACCORDANCE WITH GUIDELINES (G8) (BWM.2/CIRC.28)

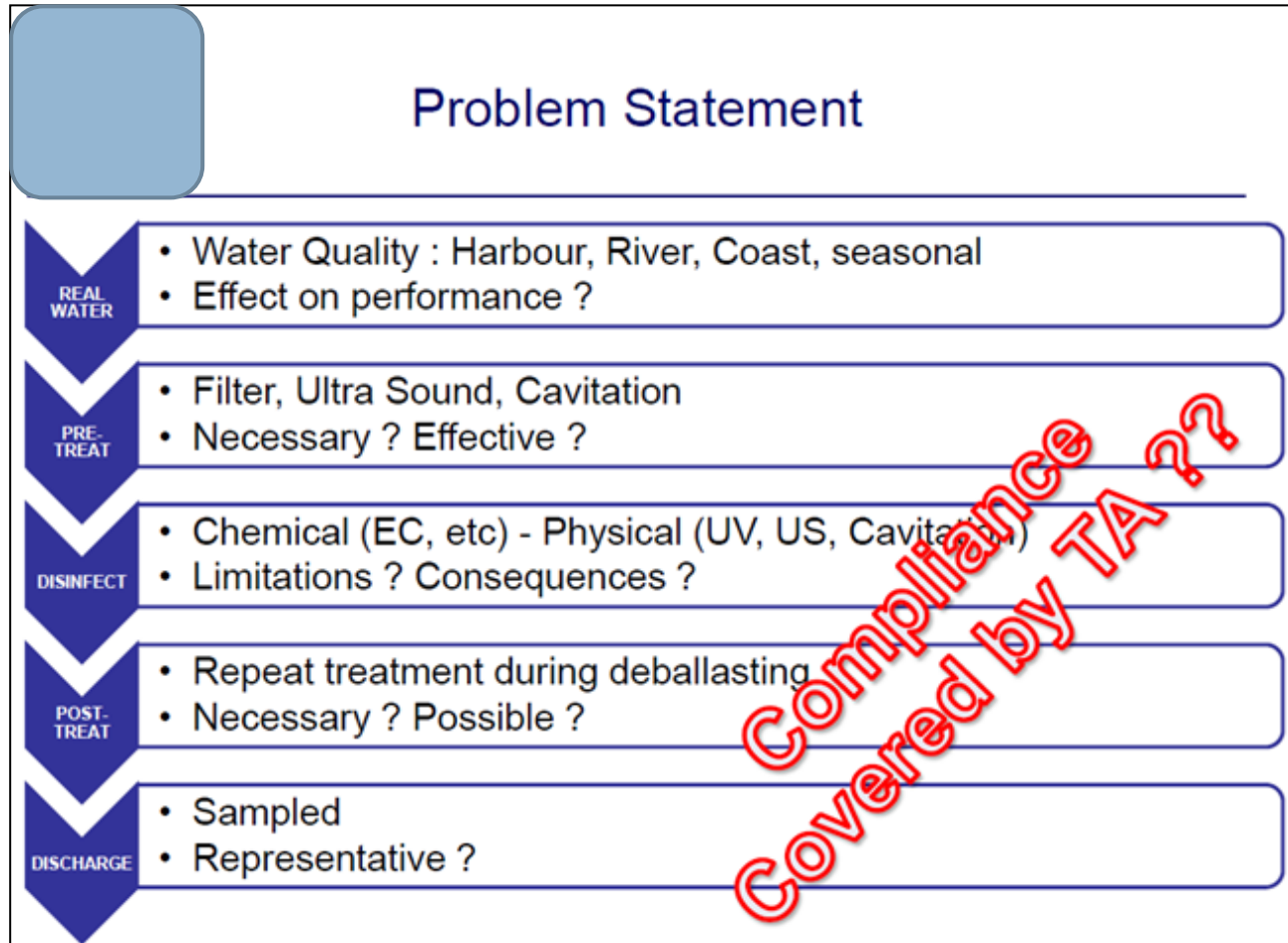
1 Paragraphs 3.1.14 and 3.1.15 are replaced by the following:

"3.1.14 Provided the following, when submitting the Type Approval application:

subject to interpretation

- .1 sufficient information to verify operation in different salinity ranges (fresh, brackish and marine water) in which the BWMS will operate;
- .2 sufficient information to verify operation in the different temperature ranges (cold, temperate and tropical) in which the BWMS will operate;
- .3 sufficient information to verify operation with the different sediment loads under which the BWMS will operate;
- .4 sufficient information to verify operation of the minimum effective treatment flow rate as well as the maximum Treatment Rated Capacity (TRC) including the duration of these tests; and
- .5 suggestions for improvements of the installation related to safety or additional testing R&D,

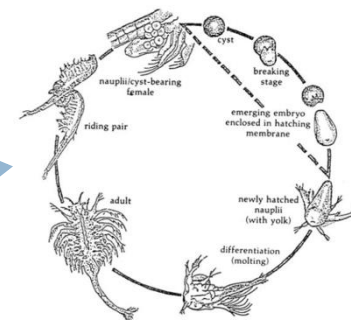
# TYPE APPROVAL: PROBLEM STATEMENT





# SALINITY AND TEMPERATURE : TEST FULL SPECTRUM !

- TA by Different National Authorities, same quality standard ?
  - Norway, ....., Germany, ....., Korea, ....., China
- Small compliance window : “5 days” → *regrowth issue*
- Selective Test waters, organisms : → “*false positive results*”



	<b>Salinity</b>	<b>DOC</b>	<b>POC</b>	<b>TSS</b>	<b>UV-T</b>
	<b>[PSU]</b>	<b>[mg C/l]</b>	<b>[mg C/l]</b>	<b>[mg/l]</b>	<b>%</b>
<b>Brackish water</b>					
IMO-requirements	3-22	>5	>5	>50	-
Range measured	21-22	5.0-5.5	5.0-5.8	50-54	62-66
<b>Seawater</b>					
IMO-requirements	>32	>1	>1	>1	-
Range measured	32-33	1.9-2.8	2.7-3.0	13-20	88-93

- Electrolysis systems require some salinity to work. At low salinity they become in-efficient and very energy consuming
- Temperature test water influences results (MEPC 63-2-16, Singapore and Norway)
- + what about organic loads, sediment loads, eggs, cysts, bacteria etc.

# TA testing should realistically represent the flow rates the system is approved for

## WHAT IS THE PROBLEM ?

- YOU can link multiple smaller capacity systems together !

YES but there is a risk **that type approval of the system in this larger configuration only 'in principle'.**

- There are systems on the market up to 20000 m<sup>3</sup>/h !

YES but were they **tested according to the type approval certificate capacities? Will system function in the same way with large amounts ?**

## MOREOVER...

- Impracticability and cost of conducting tests on larger treatment systems

**Owner may feel compelled to purchase systems that have many units in parallel. 6000/m<sup>3</sup> system may have 12 to 24 units in parallel (adds to complexity, piping, pressure drop and cost).**

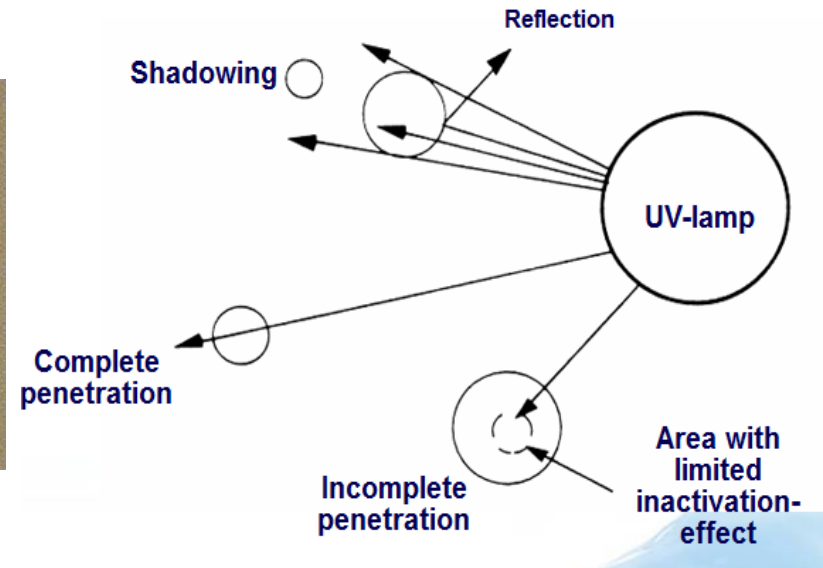
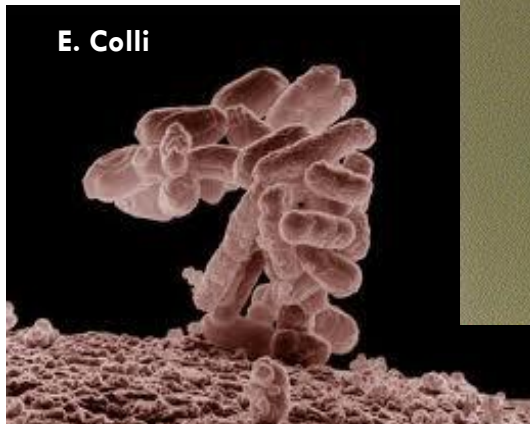
- **Additional testing requirements needed when scaling-up ?**

**G8 guidelines scale-up is permitted without the need for further land-based or shipboard tests.**

# PRE-TREATMENT NECESSARY ? (reflection)



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- Bacteria, viruses and algae can be aggregated or embedded in particles (**marine snow**)
- Such aggregates may provide **protection** against chemical and non-chemical disinfection agents.

# PRE-TREATMENT NECESSARY ? (reflection)

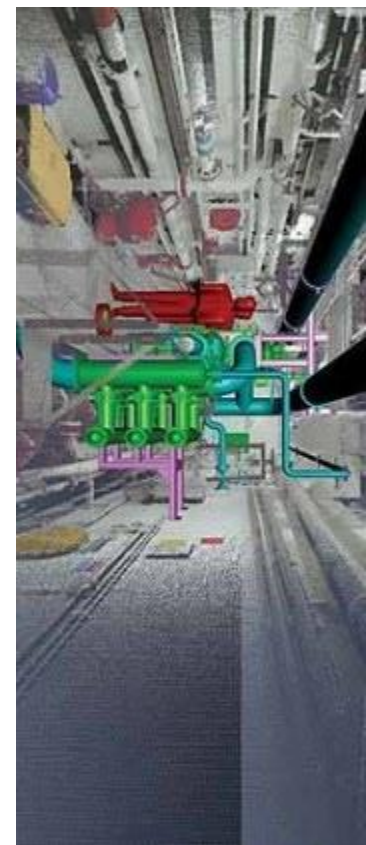
- Proper filtration for removal of particles, or destruction of particles by ultrasound or cavitation, seems **obvious** for efficient disinfection.
  - ❑ Mesh filters, discs filters : clogging issues → Cleaning technology
  - ❑ Ultrasound : “not effective with ‘soft’ organisms” (hard surface OK)
  - ❑ Cavitation : “not effective in flowing water” (boundary layer only)
- Future legislation? USCG TA (enforce pre-treatment) ?
- Filtering difficult at BW discharge :
  - ❑ Filter assists disinfection process, minimizes kWe consumption and prevents sedimentation
  - ❑ Filter back flushing may cost 20% capacity/time, affecting cargo operations.
  - ❑ Filter is 30% total cost
- Pressure/vacuum systems the solution ?

## 2. EXISTING FLEET: WHEN DO WE NEED TOM COMPLY ?

+ how do we comply (discussion in IMO/EMSA coming years ?)



- Type of vessel
- Regulations (Gas tanker: additional security issues)
- Small ships have less space in engine rooms
- operating areas have to remain free (e.g. Gangway min. 600 mm x 2000 mm)
- room height has to be considered
- entrance to existing equipment for operation and maintenance,
- stairways, emergency exits, man holes has to be kept free
- pipe crossings ( cross over ) below floor in most of the cases not possible
- operating space for screws, bolts, nuts, handles, ...
- no connections of fluid pipes above electrical devices
- additional space for insulation
- no welding close to / on tanks because of tank coating
- minimum distance between pipes / components
- usage of standard parts for repair
- minimum distances between pipe bends due to fabrication
- ... etc.



# 3. SHORT SEA: EXEMPTIONS

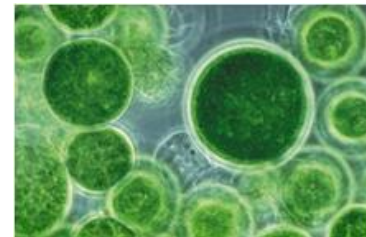


## EXEMPTIONS

- IMO BWMC Regulation A-4
- Granted to:
  - ship(s) on voyage(s) between specified ports or locations
  - ship operating exclusively between specified ports or locations
- Conditions:
  - exemption effective for five years maximum, subject to intermediate review
  - ships do not mix ballast water or sediments other than between said ports or locations
  - granted based on the IMO guidelines on **RISK ASSESSMENT**

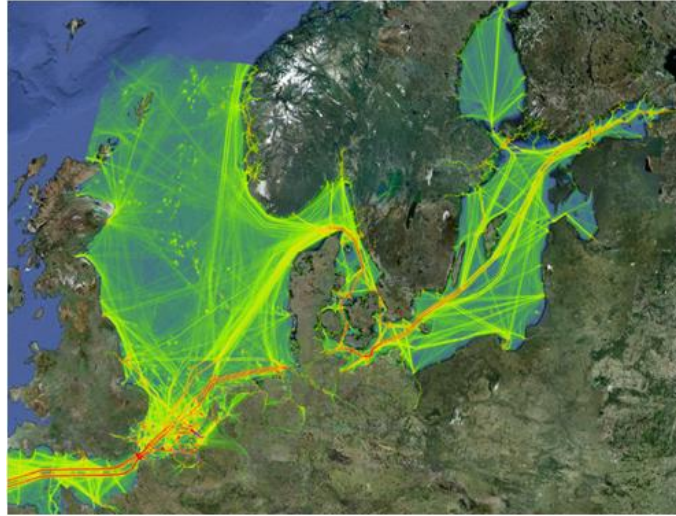
## RISK ASSESSMENT

- ✓ **Precautionary rule: burden of proof lies with the shipowner !**
  - ✓ **IMO Guidelines – Resolution MEPC.162(56)**
  - ✓ **HELCOM/OSPAR Guidelines (2013)**
  - ✓ **Prerequisites for exemptions:**
    - Biological assessment of presence of Target Species in port A and port B
    - Two ports should have same type of water, preferably with natural mixing
    - Risk assessment must demonstrate “low/acceptable” risk
- How to undertake biological assessments?
  - Which species are considered Target Species?
  - What is acceptable risk?
  - Grace period?



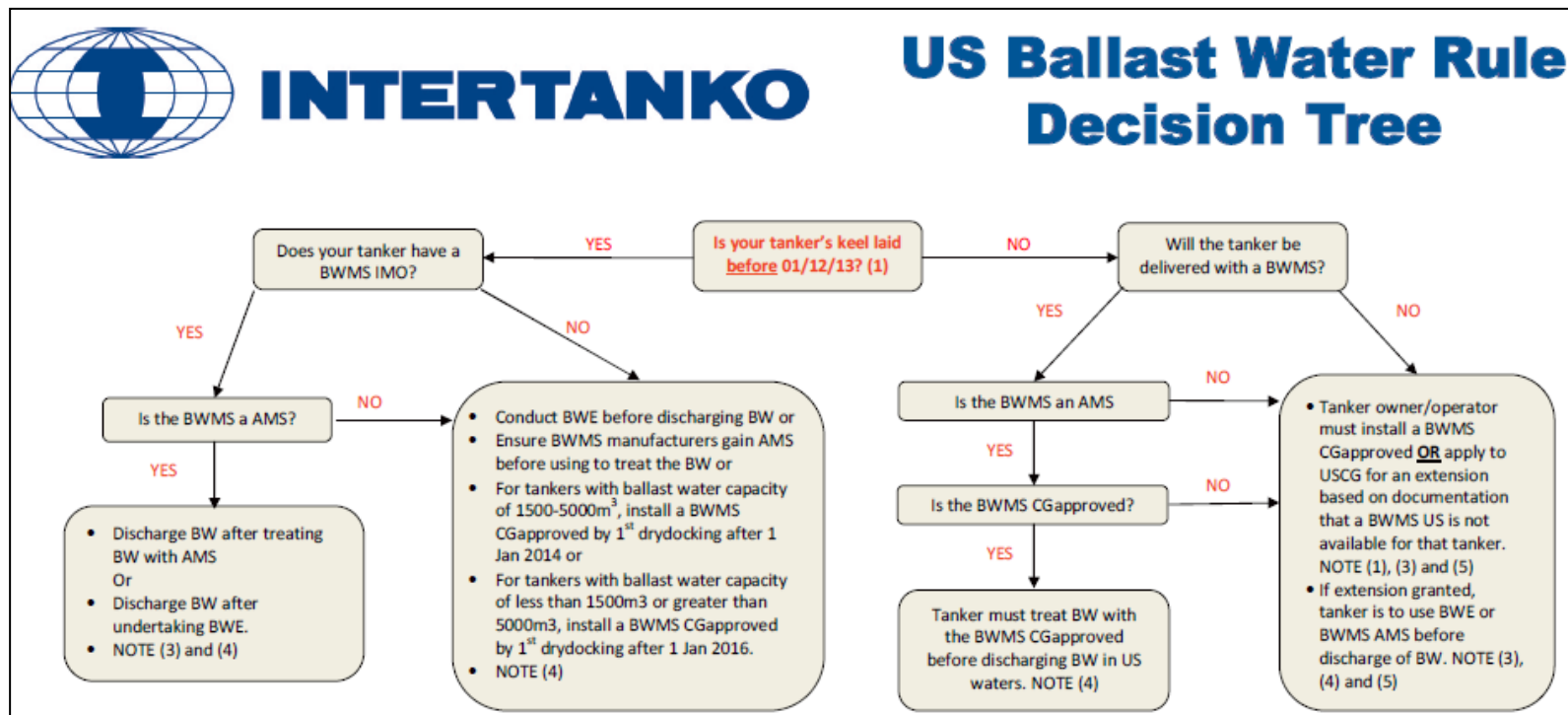


# SHORT SEA SHIPPING – WAY FORWARD



- Exemption guidelines at present too complex / too uncertain – will deter applications
- Is there scope to revitalise concept of ‘exemption zones’, areas where the risk of spreading is low?
- Can there be (more) exchange zones in Northern Europe or exemption from D1 standard?
- Can we re-open debate in IMO?

# US REQUIREMENTS



To use this AMS, the operator must:

- Request for an exemption indicating the reason and request the use of such AMS
- It is not for 5 years but for a time frame defined by the USCG (and will be till the first system is expected to be type approved by the USCG)

Note also that:

- The US Environmental Protection Agency has also rules and requirements and this agency is NOT required to follow the USCG rules
- It is not guaranteed that the AMS will pass the USCG approval system

# CONCLUSION

- ❑ **Assembly resolution positive but we're not relaxed....yet**
- ❑ **Royal Belgian Shipowners Association members preparing for new builds (post 2012)**
- ❑ **A lot of time and effort due to weak G8 guidelines**
- ❑ **RBSA will push for amendments to IMO's BWM G8 Guidelines based upon experience gained from members.**
- ❑ **Sharing of experience and information essential !**
  - ✓ **Does the BWMS work?**
  - ✓ **Does it work as it was approved to work?**
  - ✓ **Does it meet the discharge standards?**
- ❑ **RBSA will continue to seek clarity and provide guidance to members on the US requirements**
- ❑ **Installation of BWTS on existing ship = next challenge !**



# THANK YOU

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