



Chios Marine Club event
Auditorium, Tsakos Columbia Shipmanagement S.A.

Air Emissions Update
20TH October 2016



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for a safer world

Agenda

The items to be discussed in this presentation are:

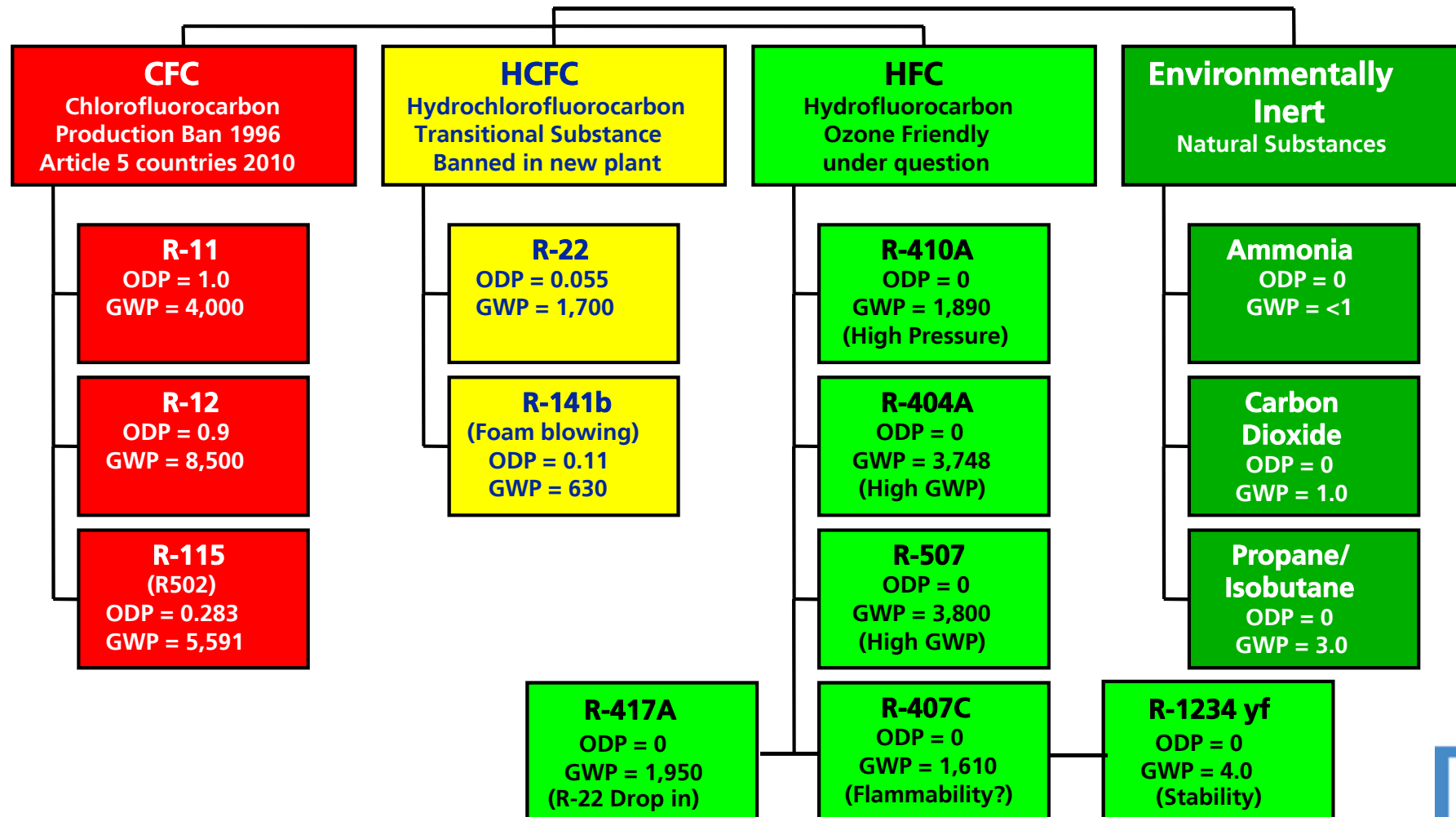
- MARPOL Annex VI Reg.12 – Ozone Depleting Substances (ODS)
- MARPOL Annex VI Reg.13 – Oxides of Nitrogen (NO_x)
- MARPOL Annex VI Reg.14 – Oxides of Sulphur (SO_x)

Feedback from Members also included:

- Global Sulphur Cap of 0.5% m/m
- Ballast Water Management update

MARPOL Annex VI

Reg.12 Ozone Depleting Substances



MARPOL Annex VI

Reg.12 Ozone Depleting Substances

- Prohibits new installations containing ozone depleting substances eg CFC refrigerant gases & HALON fire fighting agents
 - (except HCFC until 1 Jan 2020 – *but* banned by other legislation!)
- Existing ships can retain HALONS & other ODS until replaced or required to be removed by international, national or other requirements
- Prohibits deliberate emissions during maintenance, service, repair
- Requires ODS removed to be delivered to reception facilities
- Natural substances - carbon dioxide, ammonia, propane. Free of legislation but safety considerations, toxicity, flammability

EU Legislation Ozone Depleting Substances

- Definition of "Use" as per Regulation (EC) 2037/2000:
"The charging, topping up and removal of refrigerant from the system or equipment."
- What is not construed as Use:
Circulation within the system is not considered as "use"
- Thus the continued use of HCFCs refrigerants in existing systems after their final ban date will not be legislated against
- Halon:

Decommissioning date for EC Flag State countries - 31 Dec 2003. Recycled Halon available in some Member States for 'emergency use'.

Current Status Refrigeration Gases

- Refrigeration Record Book (revised Annex VI)
- **MARPOL Annex VI, Reg.12** only covers Ozone Depleting Substances and not gases with high Global Warming Potential.
- **Kyoto Protocol Article 2** - proposes a blending of policies and measures for the limitation and/or reduction, in the transport sector, of emissions of greenhouse gases not controlled by the Montreal Protocol.
- **Regulation (EU) 517/2014 Article 3** prohibits the intentional release of HFC gases in the atmosphere.

Sample log sheet for EU and MARPOL Annex VI

Log Sheet for Record Keeping Obligation, RAC Equipment

This record sheet allows compliance with Revised MARPOL Annex VI, Reg. 12, 1005/2009 & 842/2006. A separate sheet must be kept for each refrigeration system that contains 3 kg or more of refrigerant.

RECORD SHEET FOR MARPOL ANNEX VI & EUROPEAN REGULATION COMPLIANCE			
General Information			
Ships Name		IMO No.	
Plant Name		Reference No.	
Location of plant			
Company and operator's name			
Cooling loads served			
Refrigerant Type		Refrigerant Quantity (kg)	
Plant manufacturer		Year of installation	
Refrigerant Additions			
Date	Engineer/Company	Amount Added, kg	Reason for addition
Refrigerant Removals			
Date	Engineer/Company	Amount Removed, kg	Reason for removal. What was done with recovered refrigerant
Leak Tests			
Date	Engineer/Company	Test Result (including location and cause of any leaks identified)	Follow up actions required
Follow-up Actions			
Date	Engineer/Company	Related to test on	Actions Taken
Testing of Automatic Leak Detection System (if fitted)			
Date	Engineer/Company	Test Result	Comments
Refrigerant delivered or removed from ship			
Date	Company	Quantity	Comments

Sample log sheet for EU and MARPOL Annex VI
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Future Developments Refrigeration Gases

- Changes to the F-Gas Regulation in 2015 – Table shows summary of impact for systems:
- Kyoto Protocol will also be strengthened and (HFCs) are one of the six GHG controlled by this Protocol
- Owners/Operators using high GWP HFCs, will need to have a strategy once the phase down is applied.

Ban effective from 1st Jan ...	Application	Ban effective for refrigerants with GWP>
2015	Domestic fridges, freezers	150
2020	Commercial fridges, freezers	2500
2020	Moveable room air conditioning	150
2022	Commercial fridges, freezers	150
2022	Central plant >40 kW cooling capacity in Commercial supermarket applications	150
2025	Single split air conditioning with less than 3kg Charge	750

MARPOL Annex VI

Reg.13 Nitrogen Oxides (NOx) - Application

Shall apply to \Rightarrow Diesel engines \Rightarrow with a power output more than 130 kW \Rightarrow Installed on a ship constructed on or after 1st January 2000

Shall apply to \Rightarrow Diesel engines \Rightarrow with a power output more than 130 kW \Rightarrow which undergo a major conversion on or after 1st January 2000

Shall apply to \Rightarrow Diesel engines \Rightarrow with a power output more than 5000 kW and cyl displ > 90 L \Rightarrow Installed on a ship on or after 1st January 1990 but before 31 December 1999, if AM available

- Shall not apply to \Rightarrow
- Emergency diesel engines
 - Engines installed in lifeboats
 - Any device or equipment intended to be used solely in case of emergency

MARPOL Annex VI

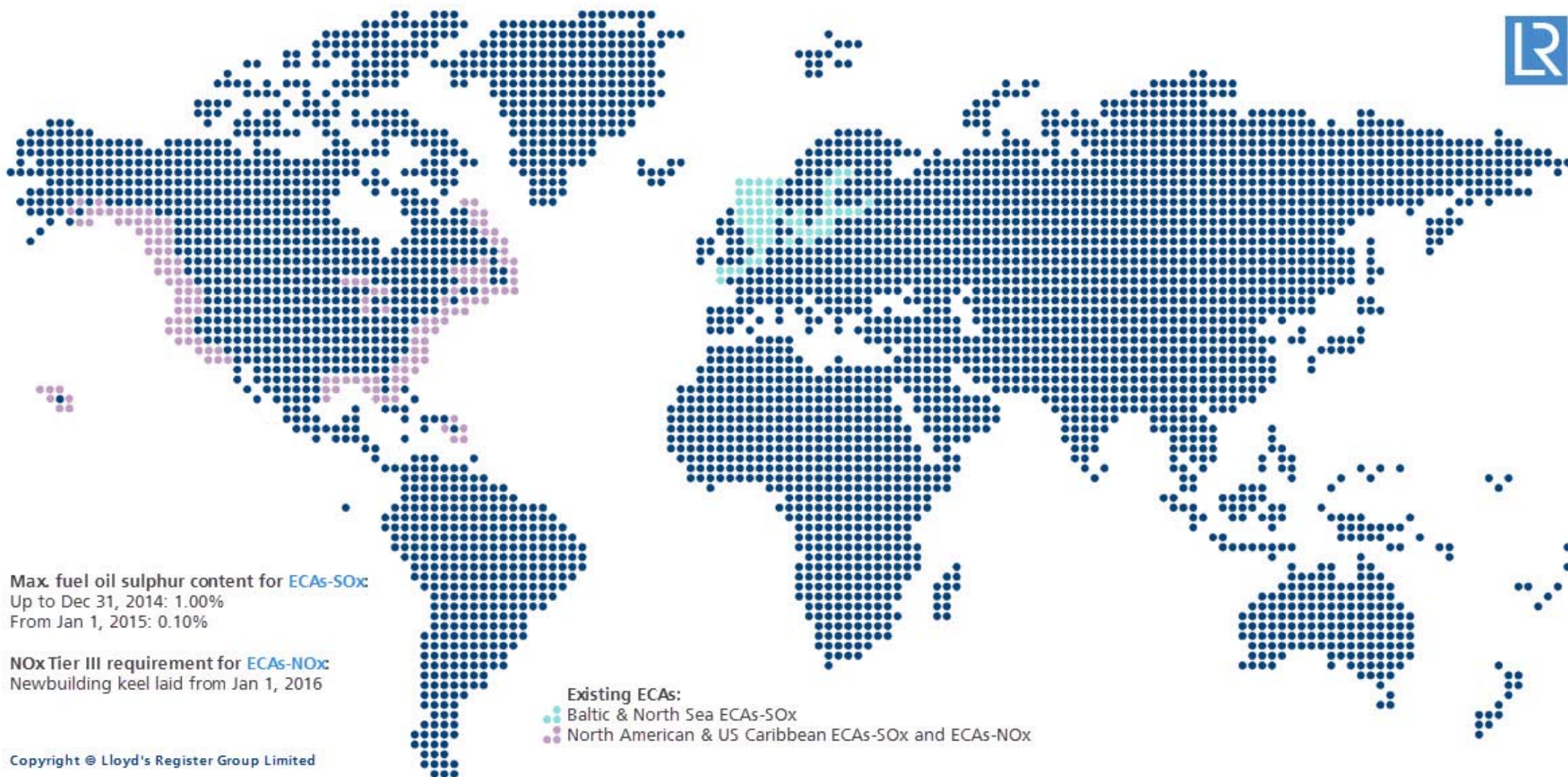
Reg.13 Nitrogen Oxides (NOx)

- **EIAPP Certificate**
 - Details of the engine eg. power, serial number, duty cycle
- **Technical File**
 - Details of engine components that influence NOx
 - Copy of the test-bed emissions test report
 - Specifications for replacement parts
 - Onboard verification procedure
(Engine Parameter, Simplified Measurement, Direct Monitoring)
- **Engine's Parameter Log Book**
 - any changes made to components and settings listed in the Technical File

revised MARPOL Annex VI Reg.13 Nitrogen Oxides (NOx)

- **Tier I:** ships constructed on or after 1/1/2000 – 31/12/2010
Engines have to be certified to this standard.
- **Tier II:** ships constructed on or after 1/1/2011- 31/12/2015
Engines have to be certified to this standard.
- **Tier III Engines:** ships constructed on or after 1 Jan 2016 – Engines to operate as:
 - Tier III standard when in an NOx ECA under Regulation 13.6 or
 - Tier II when operating outside an ECA.
- **Approved Methods :** 1 January 1990 – 31 December 1999 Engines with power of more than 5,000 kW and a per cylinder displacement at or above 90 litres: retrofit kit where available.
- **Alternatives :** LNG as fuel, Exhaust Gas Recirculation (EGR), Selective Catalytic Reduction (SCR) can be used to meet above limits

NOx Emission Control Areas



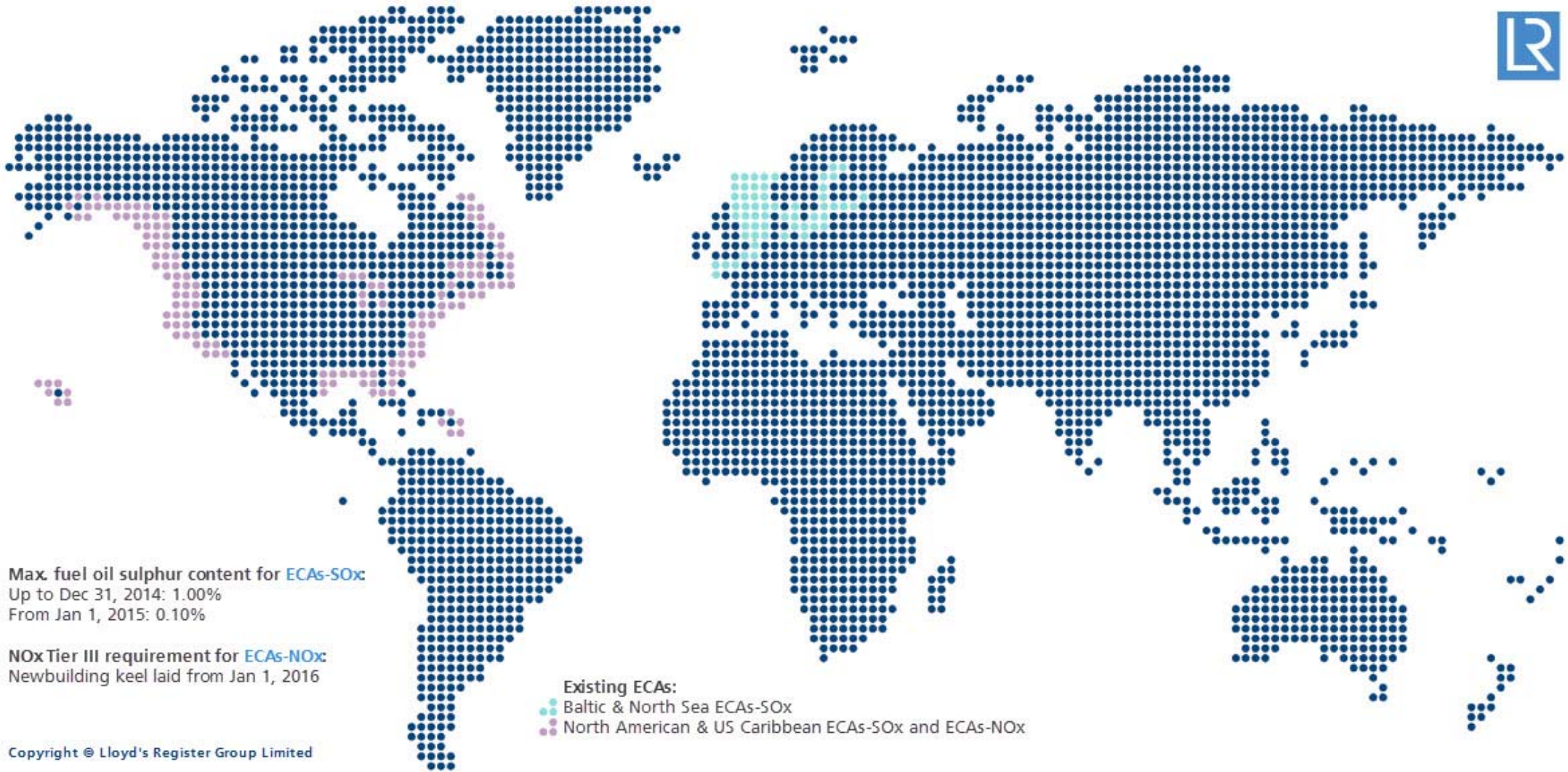
Future Developments

Reg.13 Oxides of Nitrogen (NOx)

MEPC 70

- Proposal to designate the **Baltic Sea** as NECA (MEPC 70/5/1)
Submitted by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, the Russian Federation, Sweden
- Proposal to designate the **North Sea** as NECA (MEPC 70/5/Rev.1)
Submitted by Belgium, Denmark, France, Germany, the Netherlands, Norway, Sweden and the UK
- Application to ships constructed on or after **1 Jan 2021** and operating in NECAs
- Exemptions
 - repairs at a yard in Baltic and/or North Sea
 - sea trials
 - follows a direct route inside the ECA(s) to or from the shipyard

SOx Emission Control Areas



Max. fuel oil sulphur content for **ECAs-SOx**:
Up to Dec 31, 2014: 1.00%
From Jan 1, 2015: 0.10%

NOx Tier III requirement for **ECAs-NOx**:
Newbuilding keel laid from Jan 1, 2016

Existing ECAs:
● Baltic & North Sea ECAs-SOx
● North American & US Caribbean ECAs-SOx and ECAs-NOx

China update

Emission Control Areas – SOx emissions

- **Yangtze River Delta (1 April 2016)** Shanghai, Ningbo-Zhousan, Suzhou, Nantong
- **Pearl River Delta (1 Jan 2017)** Guangzhou, Zhuhai
- **Bohai Bay Rim (1 Jan 2017)** Tianjin, Qinhuangdao, Tangshan, Huanghua
- Ships must use fuel with **S 0.50% m/m** whilst at berth at **key** ports
- Ships must switch to compliant fuel within 1 hr of arriving at berth and burn 1hr prior to departure
- **1 Jan 2018** – ships at berth at **all ports in ECAs** must use fuel with S 0.50% m/m
- **1 Jan 2019** – ships at berth **anywhere in ECAs** must use fuel with S 0.50% m/m
- Ships are also encouraged to use fuel with S 0.10% m/m while at berth

Global Sulphur Cap of 0.5% m/m



MEPC 70 (24-28 Oct.2016)

- **IMO** commissioned study, prepared by the Dutch consultant **CE Delft** claims there will be sufficient refining capacity to produce compliant fuels by 2020

while at the same time supplying other sectors with the petroleum products they require

- Independent study submitted by **BIMCO** and **IPIECA** argues that refineries will have extreme difficulties in meeting demand while serving other sectors with petroleum products and warned on surpluses and deficits.
- The outcome will be based on a **political decision**. 87 signatory States to MARPOL Annex VI; unless the majority (more than 50%) agree that 2020 is impossible to reach, it is highly likely this will be the enforcement date for 0.50% S m/m.
- 28 EU Member States – EU in implementation route of 0.50% S m/m within territorial waters (200 nautical miles)

Ballast Water Management update



Chios Marine Club event_20.10.2016

Ballast Water Management Convention, 2004

Current Status: **53 Member States** representing **53.28%** of the world tonnage

EIF: 08 September 2017


Albania, Antigua & Barbuda, Barbados, Belgium, Brazil, Canada, Congo, Cook Islands, Croatia, Denmark, Egypt, Fiji, Finland, France, Georgia, Germany, Ghana, Indonesia, Iran, Japan, Jordan, Kenya, Kiribati, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mexico, Mongolia, Montenegro, Morocco, Netherlands, Nigeria, Niue, Norway, Palau, **Panama**, Peru, Republic of Korea, Russian Federation, Saint Kitts and Nevis, Saint Lucia, Sierra Leone, South Africa, Spain, Sweden, Switzerland, Syrian Arab Republic, Tonga, Trinidad & Tobago, Turkey, Tuvalu

Shipowners responsibilities

By 8 September 2017, all ships will be required to:

- have an **approved BWM Plan** on board,
- maintain a ballast water **Record Book**,
- manage their ballast water on every voyage by performing ballast water **exchange** (or use approved BWT S)
- undertake an **initial survey** and be issued with an International Ballast Water Management Certificate. Ships that are registered with flag administrations that are not yet a party to the Convention will need to demonstrate compliance.

Certificate no:
Page 1 of 3



International Ballast Water Management Certificate

Issued under the provisions of the International Convention for the Control and Management of Ships' Ballast Water and Sediments (hereinafter referred to as "the Convention") under the authority of the Government of _____ by _____

Particulars of ship

Name of ship
Distinctive number or letters
Port of registry
Gross Tonnage
IMO number
Date of construction
Ballast water capacity (in cubic metres)

Details of Ballast Water Management Method(s) Used

Method of Ballast Water Management used
Date installed (if applicable)
Name of manufacturer (if applicable)

The principal Ballast Water Management method(s) employed on this ship is/are:

in accordance with regulation D-1
 in accordance with regulation D-2 (describe)
 the ship is subject to regulation D-4

This is to certify:

- 1 That the ship has been surveyed in accordance with regulation E-1 of the Annex to the Convention; and
- 2 That the survey shows that Ballast Water Management on the ship complies with the Annex to the Convention.

This certificate is valid until _____ subject to surveys in accordance with regulation E-1 of the Annex to the Convention.

Completion date of the survey on which this certificate is based:
Issued at _____ on _____

Surveyor to _____
a member of the Lloyd's Register group.

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Form 2903/A (01/15/08)

Compliance Schedule for installation of BWTS

- **New ships** - Compliance on delivery for ships constructed on or after EIF.
- **Existing ships** - Compliance by first IOPP renewal survey on/after EIF.
- A treatment system is required to be fitted to vessels that carry out an IOPP renewal survey on or after 8 September 2017. The IOPP renewal survey refers to the renewal survey associated with the IOPP Certificate required under MARPOL Annex I.

MEPC 70 (24-28 Oct.2016)

Compliance dates proposals

- Proposal by Liberia (MEPC 70/4/17)

 - Second IOPP Renewal Survey after EIF

 - Review of commercial availability of appropriate technologies (2017-2020)

- Proposal by India, ICS, BIMCO, INTERTANKO, CLIA, IPTA and WSC (MEPC 70/4/15)

 - First renewal survey after the IMO determines that adequate number of revised Guidelines (G8) approved BWMS are commercially available.

 - Allow vessels whose compliance dates occur within two years (or alternate date) after EIF to adjust the installation date to the second renewal survey after EIF.

United States Coast Guard – 33 CFR Part 151

	Ballast water capacity	Date constructed	Compliance date
New vessels	All	On or after 1 December, 2013	On delivery
Existing vessels	Less than 1,500m ³	Before 1 December, 2013	First scheduled drydocking after 1 January, 2016
	1,500 – 5,000m ³	Before 1 December, 2013	First scheduled drydocking after 1 January, 2014
	Greater than 5,000m ³	Before 1 December, 2013	First scheduled drydocking after 1 January, 2016

NOT considered the first scheduled dry-docking:

- A dry-docking commenced after the date specified in Table for **emergency repairs**
- An **underwater inspection** in lieu of dry-docking
- “first scheduled dry-docking” **DATE** is the date the vessel enters a dry-dock.

USCG BWMS Type Approval

- No systems currently Type Approved under USCG regime
- 40 Manufacturers have submitted Letters of Intent (LOI)
Complete list available at www.homeport.uscg.mil
- 3 Manufacturers have submitted complete TA applications
 - ✓ Optimarin (20/09/2016)
 - ✓ Alfa Laval (22/09/2016)
 - ✓ OceanSaver (23/09/2016)
- First USCG TA expected by the end of 2016
 - ✓ Extensions already granted will remain valid until expiration
 - ✓ Extended compliance dates will continue to be granted after TA systems are available, however, applicants will have to demonstrate that available BWMS are not appropriate for their vessel.



Thank you for your attention.

For any queries please contact:

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