

---

# What, why & how.

The Inventory of Hazardous Materials

**Marco Novarino**

28 September 2018



# What is the Inventory of Hazardous Materials (IHM)?

The IHM provides ship-specific information on the actual hazardous materials present on board, in order to protect health and safety and to prevent environmental pollution at ship recycling facilities. This information will be used by the ship recycling facilities in order to decide how to manage the types and amounts of materials identified in the IHM (regulation 9 of the Convention).

Inventory of Hazardous Materials - PART I													Inventory Number: /		
Hazardous materials contained in the ship's structure and equipment															
IHM Part I-2 – Equipment and machinery containing materials listed in table A and table B of appendix 1 of the IMO guidelines															
Item number (Click for actions)	Name of equipment and machinery *	Location *	Material number (Click for actions)	Materials (classification in appendix 1) *	Parts where used *	Approximate quantity		Remarks							
						Quantity *	Unit *	PCHM/ CHM *	Ship plan ref.	Sampling report ref.	Revoking item no.	Date Added	Initials *	Other general remarks	
1			1.1												
2			2.1												
3			3.1												
4			4.1												

# Why is the IHM needed?

## Key facts

- 90% of all ship recycling
- Gravity method of dismantling
- Large tidal differences
- Lack of impermeable surfaces
- Lack of infrastructure
- Ecosystem pollution concerns
- Health and safety concerns (1000s of reported deaths)

## Need for industry improvements



'Traditional' methods of ship recycling beaching method (1986 – 2010)

Bangladesh, 2008 © Lloyd's Register

# Legislation and the IHM

---

IMO Hong Kong Convention, 2009 and European Union Ship Recycling Regulation, 2013

Both apply to ships, which are defined as...

“A vessel of any type whatsoever operating or having operated in the marine environment, and includes submersibles, floating craft, floating platforms, self-elevating platforms, FSUs and FPSOs, as well as a vessel stripped of equipment or being towed.”

# Legislation: IMO Hong Kong Convention (HKC)

Adopted May 2009 – not yet in force.

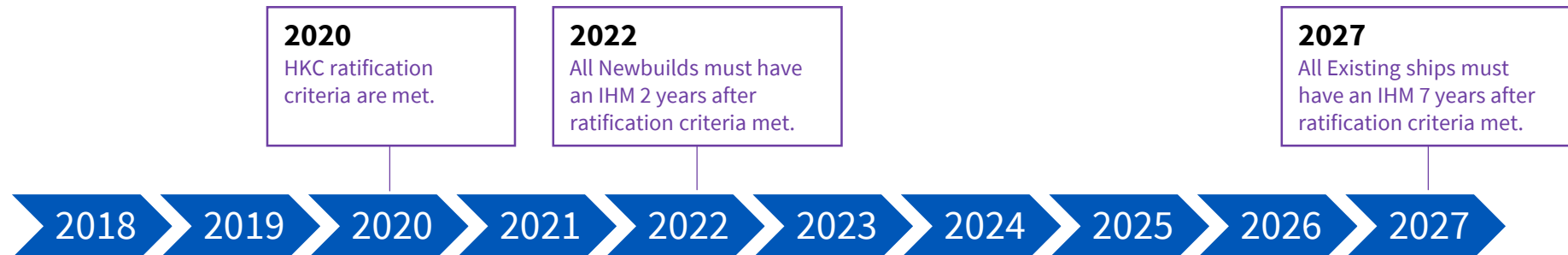
All 'ships' over 500gt will have to maintain an [IHM](#).

Will enter into force 24 months after the following have ratified the HKC:

- At least 15 states
- Representing at least 40% of the World's merchant fleet
- With a combined annual ship recycling capacity of at least 3% of that fleet



For example...



# Legislation: EU Ship Recycling Regulation (EU SRR)

---

Entered into force December 2013 – but not yet applicable.

IHM requirements mostly aligned with the IMO HKC – plus **two additional hazards (PFOS & HBCDD)** to be included.

- Inclusion criteria for additional hazards is flag dependant

Ultimately all ships entering EU waters – regardless of flag – will have to maintain an IHM

Will become applicable the earliest of:

- Publication of an EU List of approved recycling facilities at 2.5 million LTD capacity.
- 31 December 2018.



# IHM: general requirements

---

The IHM is ultimately to [assist with the recycling of the ship](#) at the end of its operational life.

The IHM consists of three parts:

- [Part I](#) - hazardous materials inherent in the ship's structure and fitted equipment
- [Part II](#) – operationally generated wastes
- [Part III](#) – ship's stores

Once the legislation has entered into force / become applicable:

- Each [new ship and existing ships](#) shall have on board an [IHM Part I](#), which should be [maintained](#) during the ship's operational life.
- Once a [decision to recycle the ship](#) has been taken [IHM Parts II and III](#) should be completed.

# IHM: hazards to be recorded

Table A (HKC) / Annex I (EU SRR) hazards to be recorded in IHM part I

HKC/EUSRR hazards		Threshold
Asbestos		0.1%
Polychlorinated biphenyls (PCBs)		50 mg/kg
Ozone-depleting substances (ODS)	CFCs	No threshold value
	Halons	
	Other fully halogenated CFCs	
	Carbon tetrachloride	
	1, 1, 1 – trichloroethane (methyl chloroform)	
	Hydrochlorofluorocarbons (HCFCs)	
	Hydrobromofluorocarbons	
	Methyl bromide	
Bromochloromethane		
Anti-fouling system containing organotin compounds as a biocide		2,500 mg total tin/kg
Perfluorooctane sulfonic acid (PFOS)*		10 mg/kg (0.001 % by weight)

\* PFOS is a requirement of EU SRR only. It is only applicable to EU flagged ships.



# IHM: hazards to be recorded

Table A (HKC) / Annex II (EU SRR) hazards to be recorded in IHM part I

HKC/EU SRR hazards	Threshold
Cadmium and cadmium compounds	100 mg/kg
Hexavalent chromium and hexavalent chromium compounds	1000 mg/kg
Lead and lead compounds	1000 mg/kg
Mercury and mercury compounds	1000 mg/kg
Polybrominated biphenyls (PBBs)	50 mg/kg
Polybrominated diphenyl ethers (PBDEs)	1000 mg/kg
Polychlorinated naphthalenes (PCNs, more than 3 chlorine atoms)	50 mg/kg
Radioactive substances	No threshold level
Certain short-chain chlorinated paraffins (alkanes, C10–C13, chloro)	1%
Brominated flame retardant (HBCDD) *	100 mg/kg (0.01% by weight)

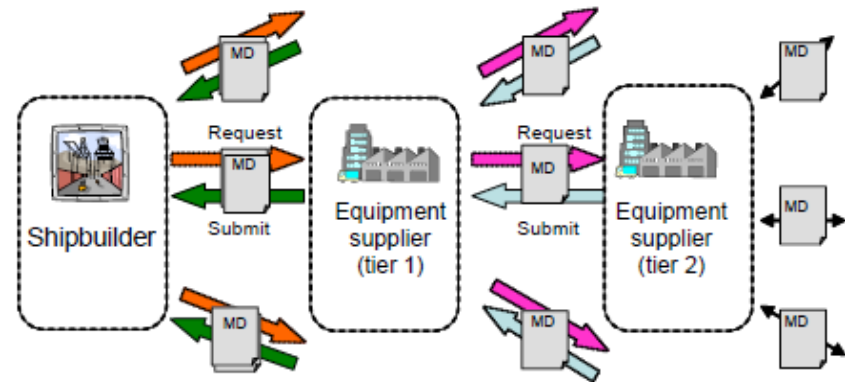
\* HBCDD is a requirement of EU SRR only. It is only applicable to EU flagged ships.

# IHM: compilation during build

Under the IMO Convention and the EU Regulation:

- **Shipbuilder** is responsible for compiling the IHM throughout the design and construction process.
- **Material Declarations (MD) and Supplier Declarations of Conformity (SDoC)** should be utilised.

**Supply contracts** between the builder and the supply chain will need to recognise that all relevant materials, locations and quantities have to be identified and the information controlled using MD and SDoC.



# IHM: compilation for existing ships

---

Shipowner is responsible for compiling the IHM for existing ships, and they may draw upon expert assistance.

- Such an expert or expert party should not be the same person or organisation authorised to approve the Inventory. As such, LR cannot compile the IHM.

In the absence of complete documentation of hazards contained within the ship's fitted equipment and structure, LR strongly recommends that a Hazardous Materials Expert is used to compile the IHM.

Documentation could include:

- Collated Material Declarations and Supplier Declarations of Conformity
- Asbestos-free certificate from build
- PCB-free certificate
- IAPP Certificate and Supplement to IAPP Certificate (recording machinery and equipment containing Ozone Depleting Substances (ODS) as required by MARPOL Annex VI
- Antifouling certificate

# IHM: compilation for existing ships

## Hazardous material experts are/can:

Specialists



Develop sampling plan



Test for hazards



Improve accuracy



Add value

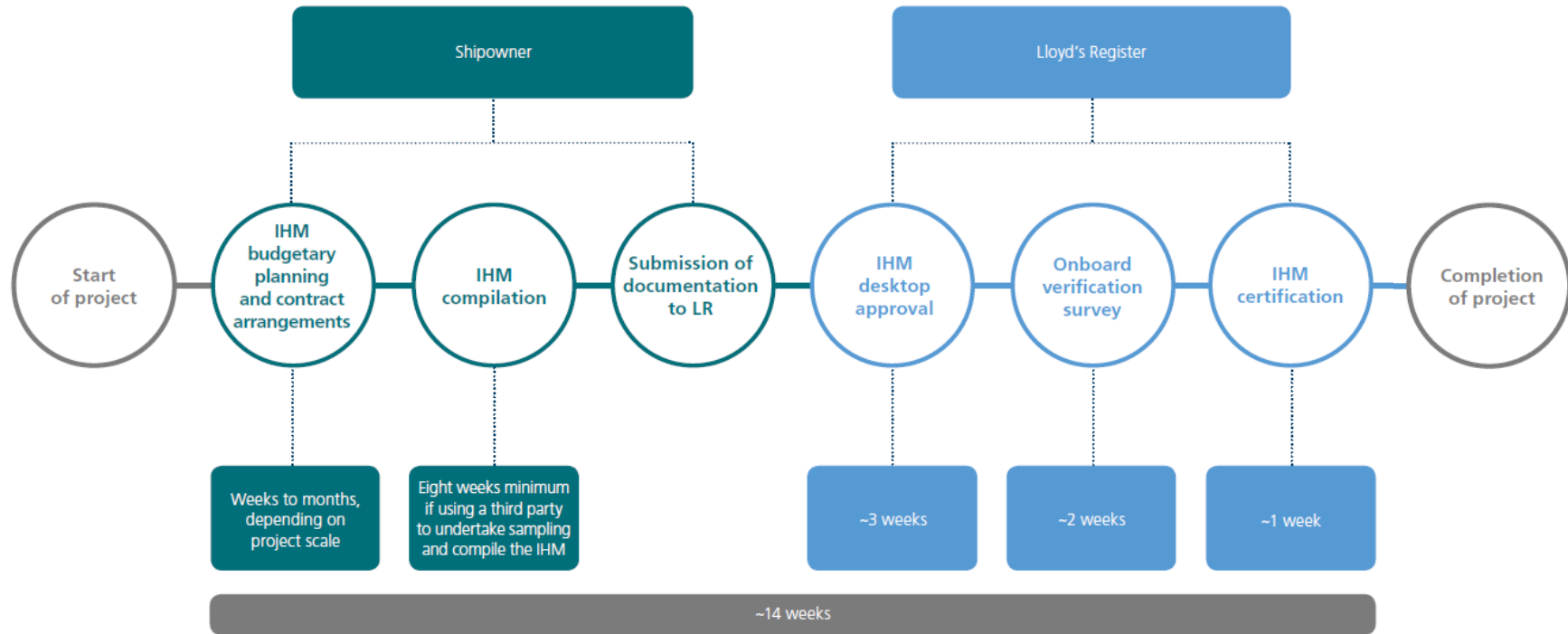


LR can and has approved hazardous material expert companies, undertaking a comprehensive audit of:

- company procedures
- personnel, records, training etc.
- marine experience / knowledge
- certification and licenses
- equipment and facilities (laboratories)

# Idealised implementation timeline for IHM certification

## End to end project for existing ships



# IHM summary

---

The IHM should [provide ship-specific information on the actual hazardous materials present](#) on board a ship in order to protect health and safety and the environment at end of life.

## IMO 2009 Hong Kong Convention

- Requirement for an IHM
- Global remit once in force
- Unknown when it will enter into force

## EU Ship Recycling Regulation 1257/2013

- IHM requirement mostly aligned with HKC
- Regional application only
- Is in force but yet to become applicable for IHM
  - Newbuilds – IHM in build contract no later than 31 Dec 2018
  - Existing ships (regardless of flag) – IHM by 31 Dec 2020 if calling at an EU port or anchorage.

[Fleet wide IHM compilation and certification projects for existing ships take time.](#)

[IHM supply and demand issues expected](#) – **don't leave it too late...**

# Thank you

---

Please contact:

Marco Novarino

+ 39 335 6319167

[marco.novarino@lr.org](mailto:marco.novarino@lr.org)