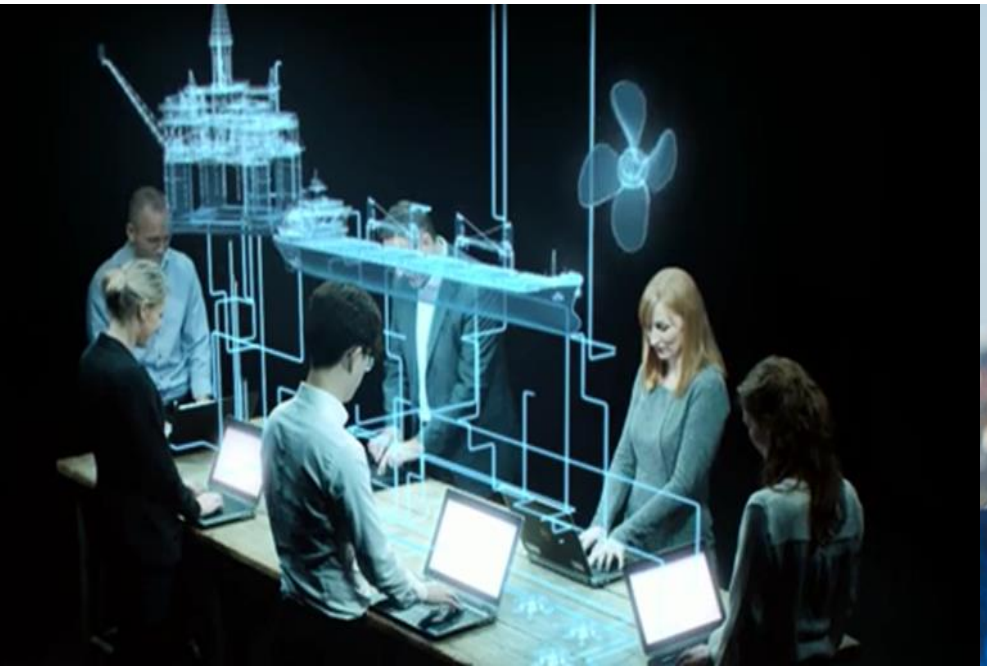


MARITIME

DNV GL view on Inventory of Hazardous Materials

Mikael Johansson, Head of Section

Serptember 2018

Public attention and awareness

Denmark ratifies the Hong Kong Convention

9 May 2017 Leave a comment

The Danish Parliament agreed the country to accede to the Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships. The Danish Shipowners Association welcomed this decision as the Convention sets global rules which aim at ensuring that ships, when being recycled after reaching the end of their operational lives, do not pose any unnecessary risk to human health and safety or to the environment.

Turkey signs up to Hong Kong Convention | TradeWinds Page 1 (

Turkey signs up to Hong Kong Convention

April 6th, 2017 18:20 GMT by **Harry Papachristou**

Turkey has become the first major shipbreaking nation to approve the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (Hong Kong Convention).

Asian owners urge positivity towards scrapyard advances | TradeWinds Page 1 of 2

Asian owners urge positivity towards scrapyard advances

Europe's hardline stance has been the focus of the recycling debate but one Japanese executive says the time has come for Asia's role in driving improvements to be recognised

Panama Accedes to Hong Kong Ship Recycling Convention

Shipowners face risk of criminal liability for illegal demolition of end-of-life vessels

By Nick Shaw and Natalia Debowska on 22 March 2018

Posted in Case Law, Environmental Issues

A Rotterdam court has found Dutch reefer operator Seatrade and two of its directors criminally liable last week for illegally selling vessels for demolition in South Asian yards in breach of the EU Waste Shipment Regulation.

The decision appears to be the first time an EU shipowner has been held criminally liable for the illegal export of vessels for demolition to South Asian yards.[1] The Dutch public prosecutor brought the cases against Seatrade over historic sales of vessels for demolition in India, Bangladesh and Turkey in 2012. The sales of the vessels took place via cash buyers. All vessels departed from Rotterdam and Hamburg on their last voyage to the South Asian yards.

Seatrade and its directors were fined up to 750,000 euros and the directors have been banned from working in the shipping industry for a year. The public prosecutor also sought prison sentences for the directors, but the court did not impose these.

UK: Company sued for severe worker injuries in ship-breaking yard in Bangladesh following vessel sale

Surge in number of accidents in Bangladesh shipbreaking yards 6 December 2017

Author: NGO Shipbreaking Platform

...[T]he accident rate for the three first quarters of 2017 [in the shipbreaking yards in Chittagong, Bangaldesh] has surged with 8 injuries and 6 deaths recorded in ten separate incidents in the last two months alone...

...Ship owners that sell their ships for dirty and dangerous breaking are now also being brought to court...[Mohamed Edris' case against Zodiac Maritime] is the first time that an injured worker demands compensation from a ship owner directly...

...Zodiac has continued to sell its ships to Bangladesh, despite the pending legal case against them, demonstrating that they have no consideration for causing harm as a result of their dirty business.

Introduction – Legal Framework

The IMO has developed a legally binding instrument on ship recycling, so called "The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ship hereafter referred to as «Hong Kong Convention», which has been adopted in 2009.

Hong Kong Convention (SR/CONF/45) is providing a solution to ship recycling on a global scale, how is not inventing something new. The requirements related to hazardous materials are taken from many different Laws and Conventions which are already in force. Hong Kong Convention brings two main requirements.

1. Each ship of 500 GT and above should have a certified Inventory of Hazardous Materials, and
2. Ship Recycling Facilities should be authorized by their competent authorities and should only accept ships that comply with the Hong Kong Convention requirements.

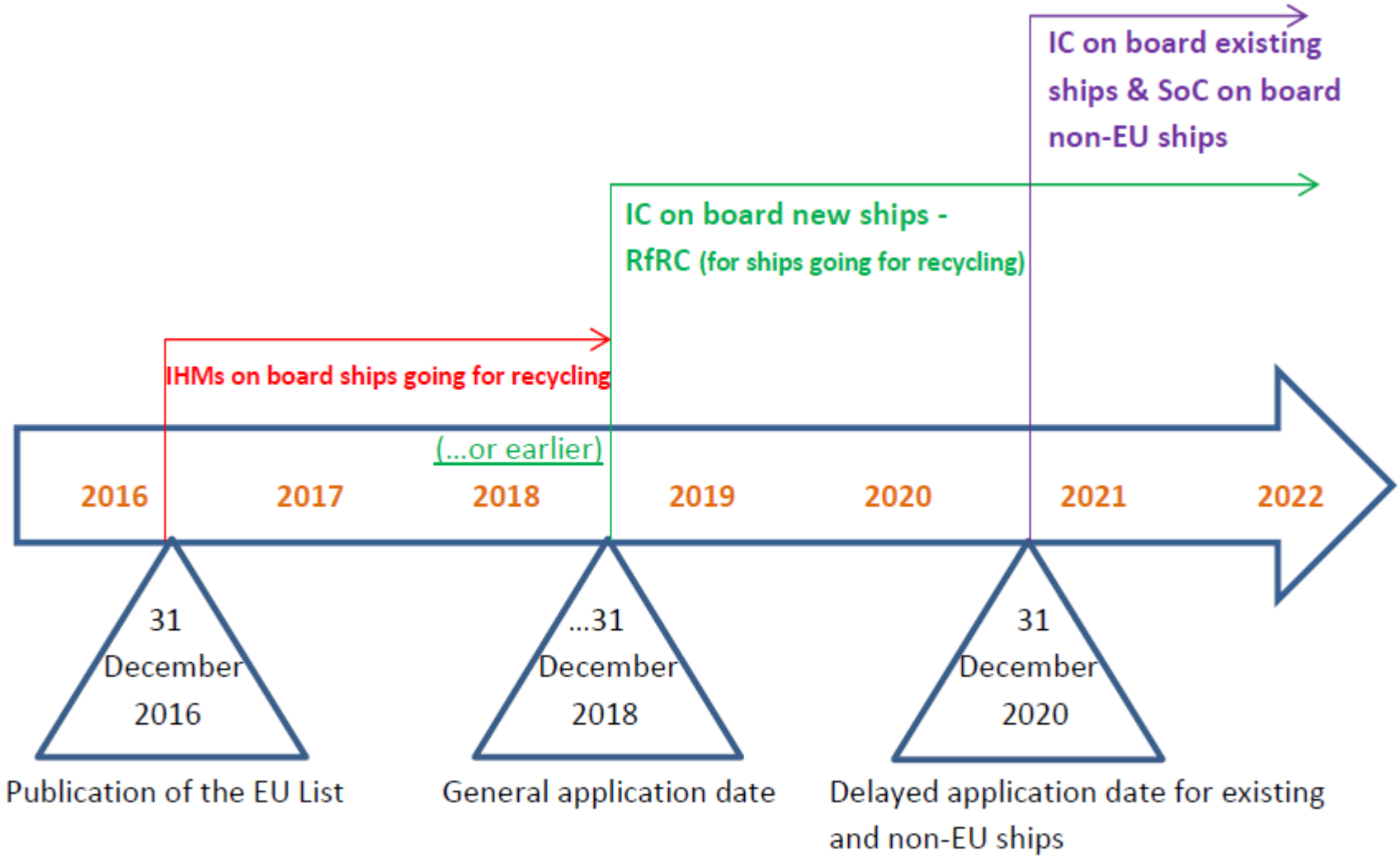
EU Regulation on Ship Recycling EC No: 1257 / 2013

In the meantime, delay on the entry into force of the Hong Kong Convention has triggered EU to take action, and a new Regulation of the European Parliament and of the Council on Ship Recycling has been adopted and entered into force on 30 December 2013. However EU Regulation can be regarded as a Flag State requirement and is only applicable on a regional level.

EU Regulation on Ship Recycling EC 1257 / 2013 brings into force an early implementation of the requirements of the Hong Kong Convention in EU level, therefore contributing to its global entry into force.

*The main difference of the EU Regulation is that two additional hazardous materials are introduced to be investigated during IHM preparations, PFOS and HBCDD, and higher standards for ship recycling facilities are introduced by publishing a European List of authorized ship recycling facilties. Please click **here** for the Technical Update on EU Regulation.*

Timeline of EU SRR



Guidelines for the development of the IHM

IHM is a list that identifies the hazardous materials that are contained in ship's structure or equipment, their location and approximate quantities. Both IMO MEPC.269(68) and EMSA BPG on IHM requirements will be provided under this chapter. In both guidelines there are;

- different approaches for new and existing ships' IHM preparation
- 3 IHM Parts identified for HazMat listings
  I. structure and equipment
  II. operational wastes
  III. stores

Scope of the IHM		Shipbuilding & Operation	Preparation prior to Recycling	
HKC	EU SRR	Part I Structure & Equipment	Part II Operationally generated Wastes	Part III Stores
Table A	Annex I	✓		
Mandatory for new / existing ships & new installations				
Table B	Annex II	✓		
Mandatory for new ships / installations; as far as practicable for existing ships				
Table C Materials Potentially hazardous items			✓	✓
Table D Materials Regular consumable goods potentially containing hazardous materials				✓

Table A: Asbestos, PCB, ODS, TBT, PFOS*

Table B: Heavy metals, PBB, PBDE, PCN, SCCP, radioactive substances, HBCDD*

* Covered in EU SRR Annexes I & II

Detailed specifications of which materials to manage are in place

TABLE A: Materials mandatory to be listed both for new and existing ships

Regulations	No.	Materials		Inventory			Threshold level
				Part I	Part II	Part III	
EMSA BPG Annex B (Materials listed in Annex I of the EU SRR) and MEPC 269(68) Table A (Materials listed in Appendix 1 of the HKC)	A-1	Asbestos		x			0.1%[1]
	A-2	Polychlorinated Biphenyls (PCBs)		x			50 mg/kg[2]
	A-3	Ozone Depleting Substances	CFCs	x			no threshold level
			Halons	x			
			Other fully halogenated CFCs	x			
			Carbon Tetrachloride	x			
			1,1,1-Trichloroethane (Methyl chloroform)	x			
			Hydrochlorofluorocarbons	x			
			Hydrobromofluorocarbons	x			
			Methyl bromide	x			
			Bromochloromethane	x			
	A-4	Anti-fouling systems containing organotin compounds as a biocide		x			2500 mg total tin/kg
EMSA BPG Annex B (Materials listed in Annex I	A-5	Perfluorooctane sulfonic acid (PFOS) and its derivatives[3]		x			10 mg/kg (0.001% by weight*)

[1] [...] However, if 1% is applied, this threshold value should be recorded in the Inventory and, if available, the Material Declaration and can be applied not later than five years after the entry into force of the Convention. The threshold value of 0.1% need not be retroactively applied to

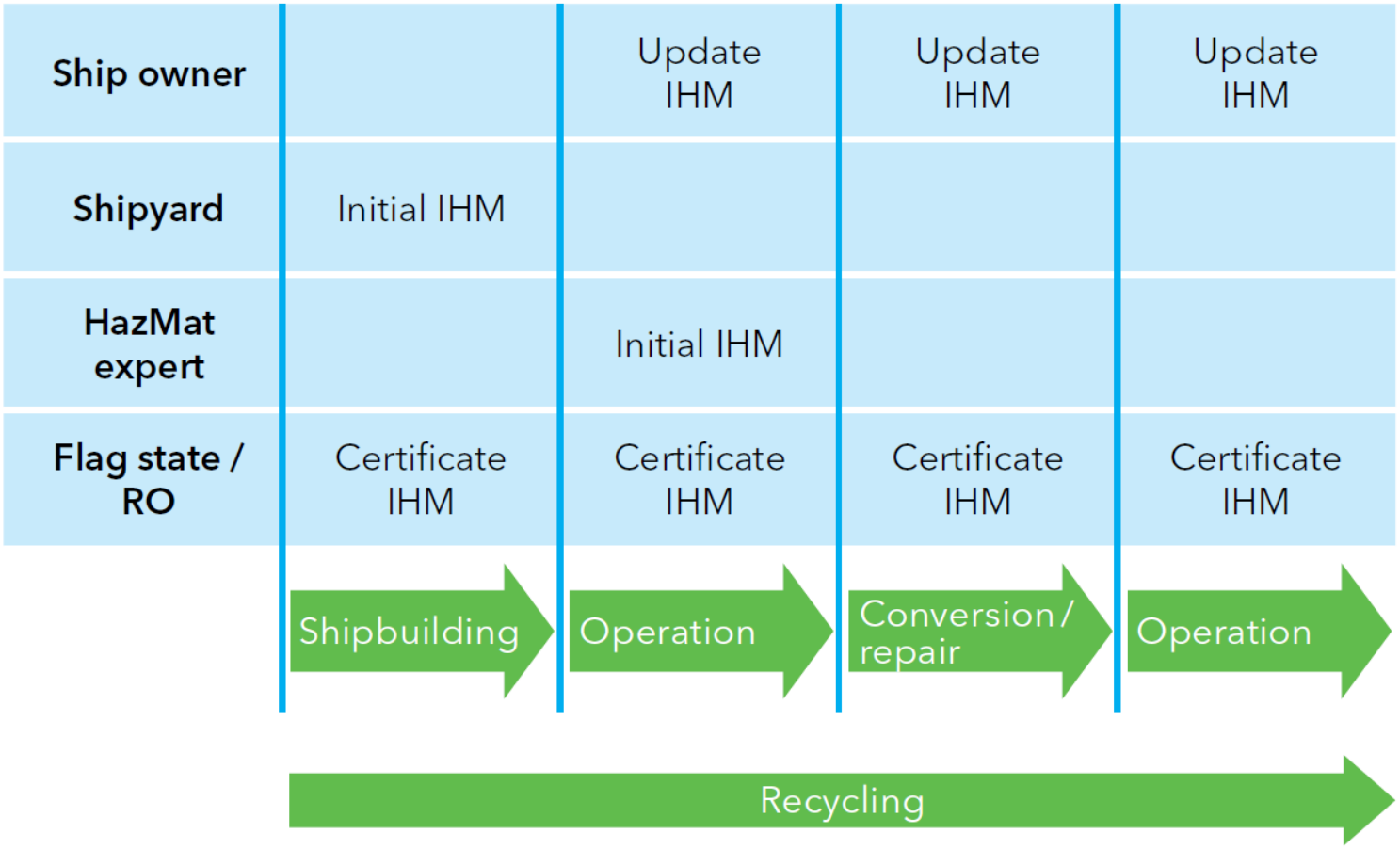
[2] In accordance with regulation 4 of the Convention, for all ships, new installation of materials which contain PCBs shall be prohibited. The Organization set 50 mg/kg as the threshold value referring to the concentration level at which wastes, substances and articles containing,

[3] Not applicable for ships flying the flag of a third country

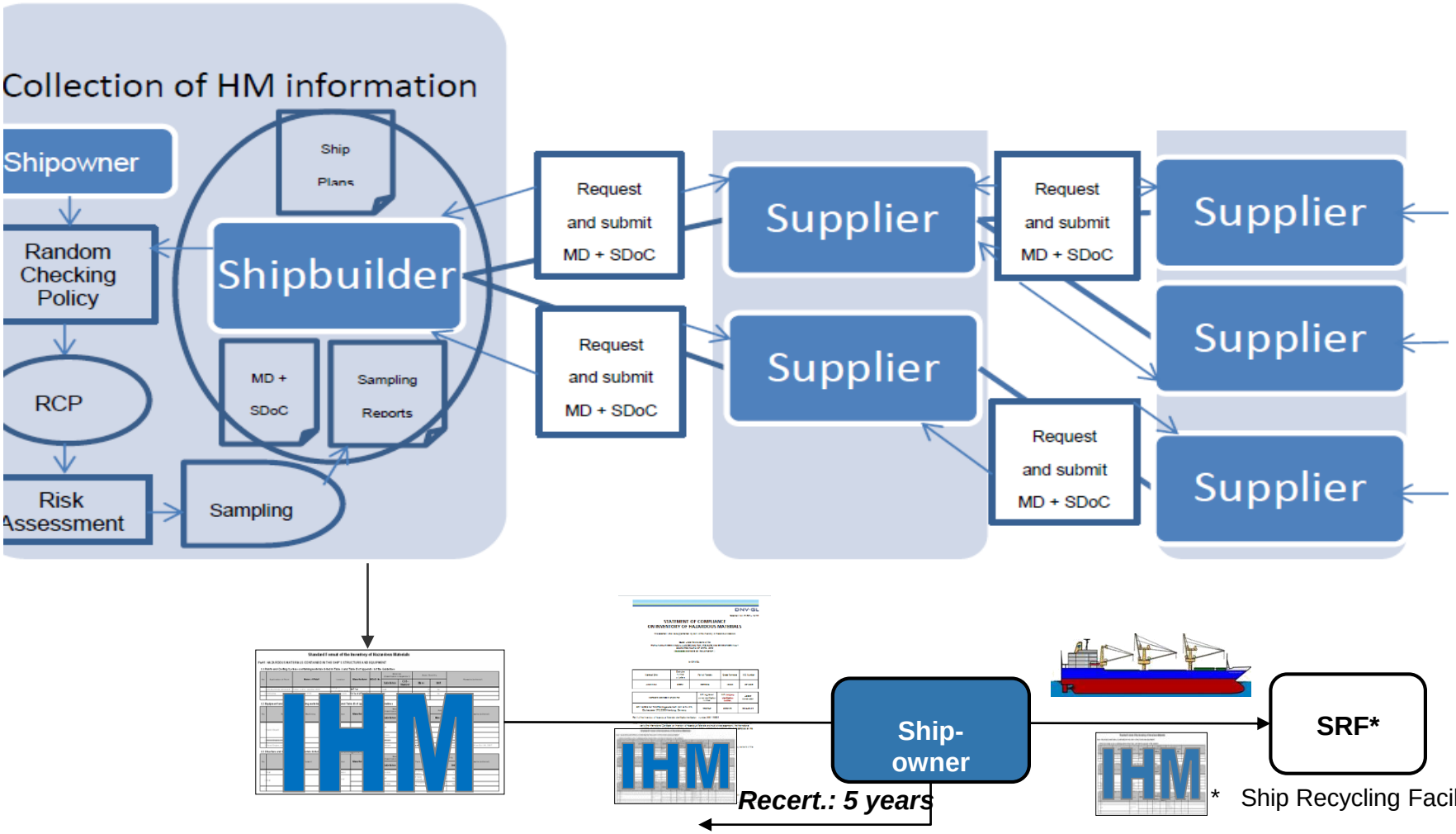
TABLE B: Materials mandatory to be listed for new ships and as far as practicable for existing ships

Regulations	No.	Materials	Inventory			Threshold level
			Part I	Part II	Part III	
EMSA BPG Annex B (Annex II of the EU SRR) and MEPC 269(68) Table B (Materials listed in Appendix 2 of the HKC)	B-1	Cadmium and Cadmium Compounds	x			100 mg/kg
	B-2	Hexavalent Chromium and Hexavalent Chromium Compounds	x			1 g/kg
	B-3	Lead and Lead Compounds	x			1 g/kg
	B-4	Mercury and Mercury Compounds	x			1 g/kg
	B-5	Polybrominated Biphenyl (PBBs)	x			50 mg/kg
	B-6	Polybrominated Diphenyl Ethers (PBDEs)	x			1 g/kg
	B-7	Polychlorinated Naphthalenes (more than 3 chlorine atoms)	x			50 mg/kg
	B-8	Radioactive Substances	x			no threshold level
	B-9	Certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, chloro)	x			1%
EMSA BPG Annex B (Annex II of the EU SRR)	B-10	Brominated Flame Retardant (HBCDD)	x			100 mg/Kg (0.01% by weight)

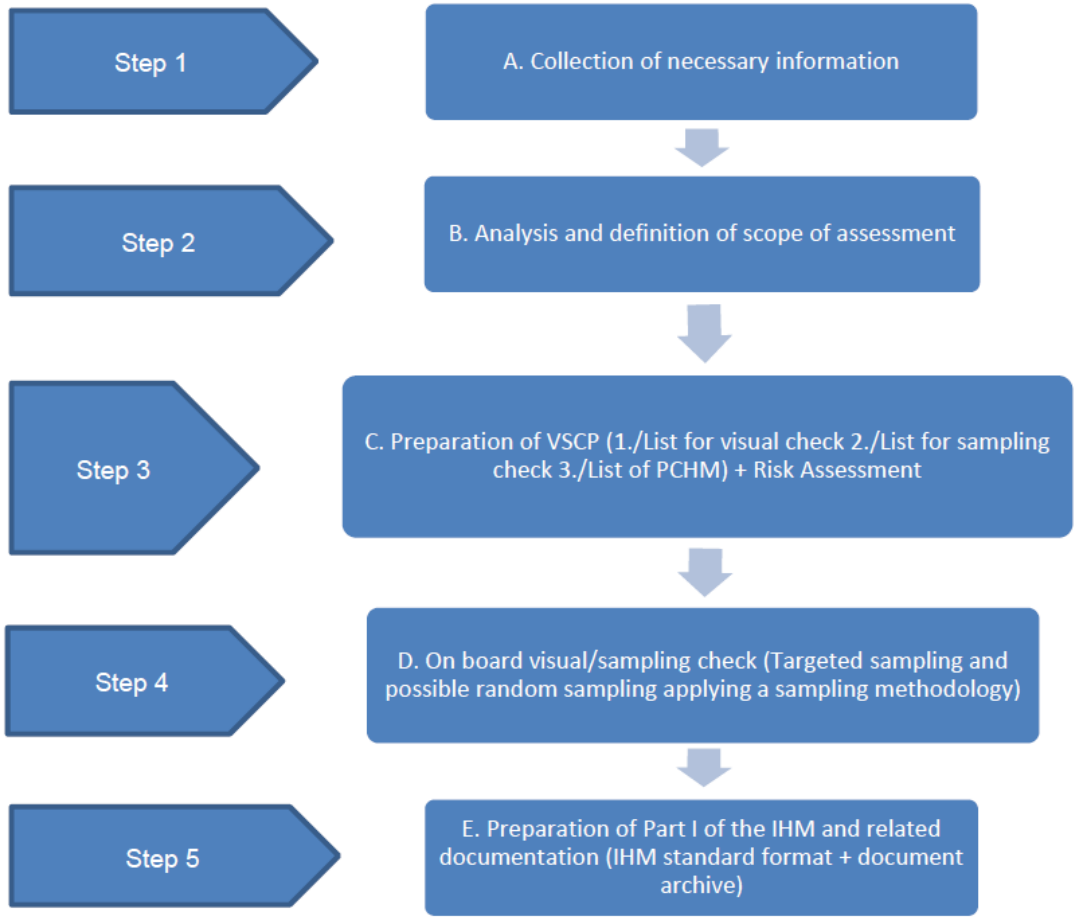
Roles and responsibilities for the IHM work



Preparation of IHM for new buildings



Preparation of IHM for ships in operation



Preparation of IHM for Existing Ships

Preparation of IHM Part I

1.1 Paints and Coating Systems another Processed Materials containing materials listed in Table A and B of Appendix 1of the Guidelines

No.	Application of Paint	Name of Paint	Location	Materials (Classification in Appendix 1)	Appx. Quantity		Remarks
1	Deck Paint	Epoxy primer	Accommodation Deck Outside	Lead	30	kg	

1.2 Equipment and Machinery containing materials listed in Table A of Appendix 1 of the Guidelines

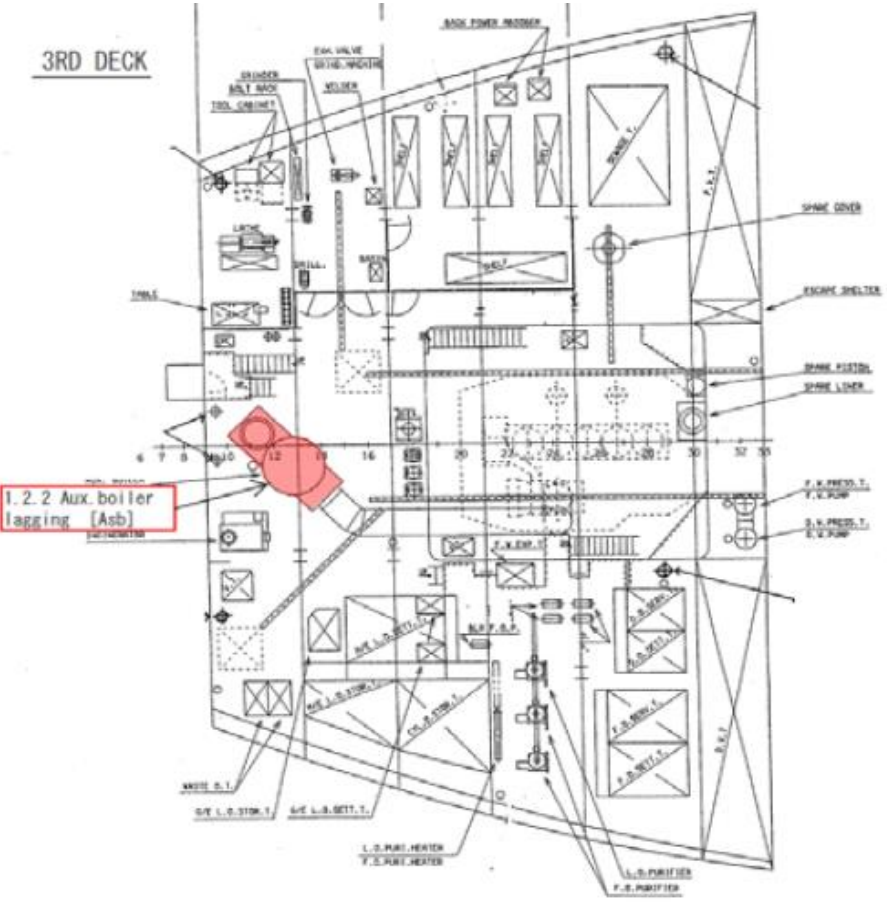
No.	Name of Equipment and Machinery	Location	Materials (Classification in Appendix 1)	Parts of Use	Appx. Quantity		Remarks
1	Exhaust Gas System	Engine Room	Asbestos	Lagging for Exhaust gas pipe	500	kg	
2	Propeller Shafting	Stern Tube	Asbestos	Packing with Hydraulic Piping	5	kg	PCHM, no access, relevant for ship operation

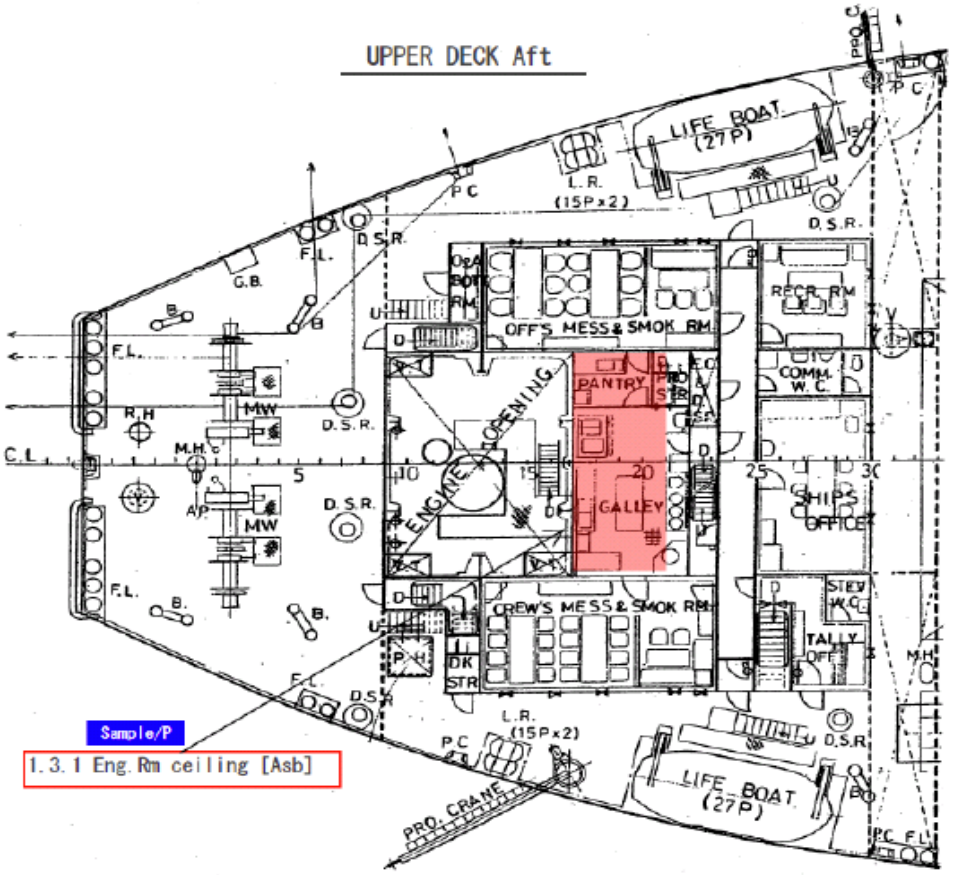
1.3 Systems containing materials listed in Table A of appendix 1 of the Guidelines

No.	Name of Structural Element	Location	Materials (Classification in Appendix 1)	Parts of Use	Appx. Quantity		Remarks
1	Ceiling Panel	Bridge / Ceiling	Asbestos	Panelling	3000	kg	
2							

Preparation of IHM for Existing Ships

Location Plan of HazMats in IHM



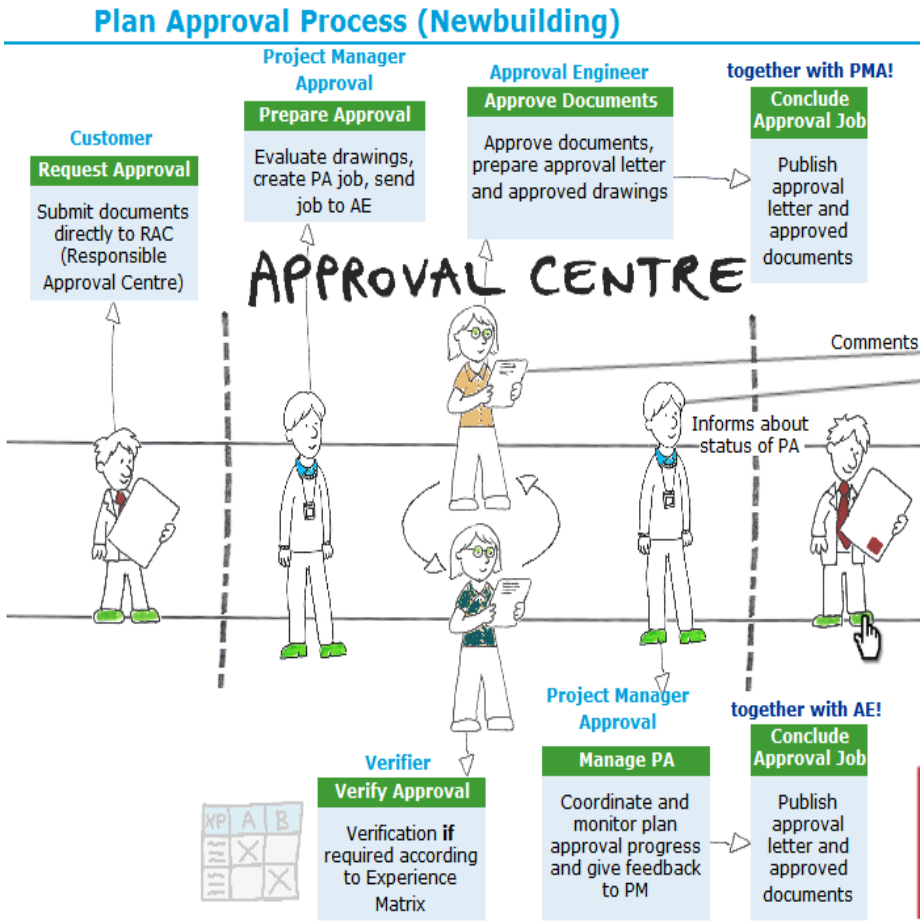


IHM part II & III

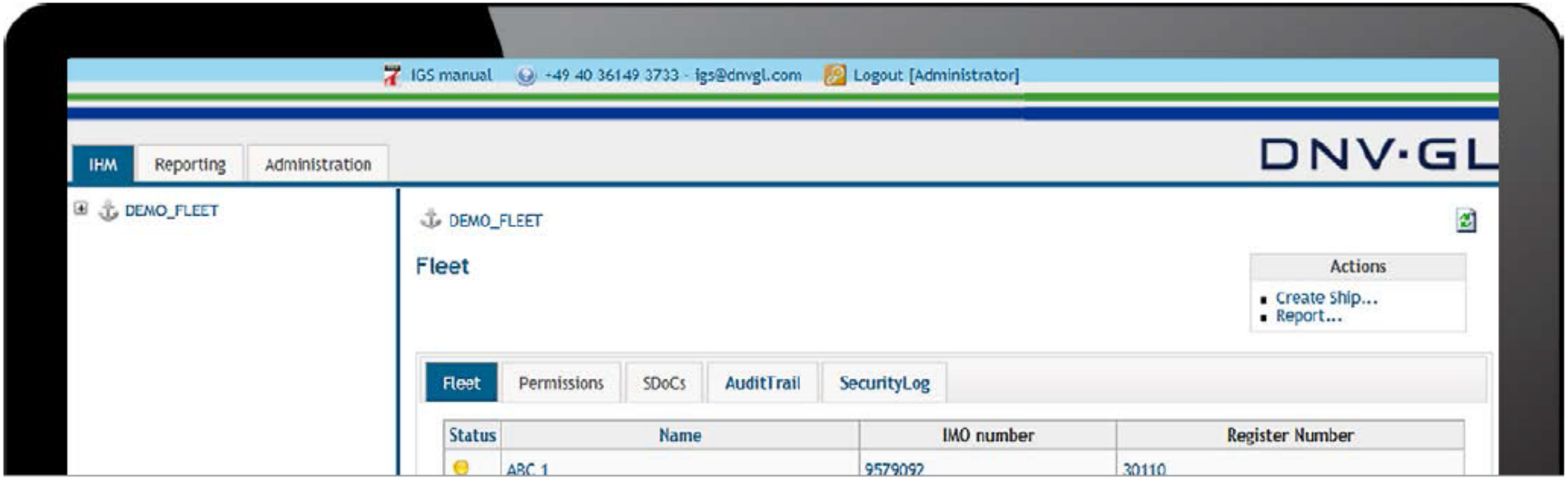
Item No.	Location	Name of item	Approximate quantity		Remarks (N/A if not applicable)
1	No. 4 sludge tk (Fr 59-82) Sludge tk S (Fr 74-78) Dirty LO tk #2 (Fr 47-58)	Waste oils, sludge	10	MT	
2	Bilge tk #5 (Fr 42-46) OWS tk (Fr 62-71)	Oily bilge	30	MT	
3	-	Oily liquid cargo tank residues	-	-	N/A
4	WATER BALLAST TANKS NAME / LOCATION FORE PEAK TANK — FR 147 – STEM BALLAST TANK #4 (P) — FR 102 – 118 BALLAST TANK #4 (S) — FR 102 – 118 BALLAST TANK #5 (P) — FR 106 – 118 BALLAST TANK #5 (S) — FR 102 – 118 BALLAST TANK #6 (P) — FR 82 – 102 BALLAST TANK #6 (S) — FR 86 – 102 BALLAST TANK #8 (P) — FR 46 – 60 BALLAST TANK #8 (S) — FR 46 – 60 BALLAST TANK #9 (P) — FR 46 – 60 BALLAST TANK #9 (S) — FR 46 – 60 BALLAST TANK #10 (P) — FR 26 – 42 BALLAST TANK #10 (S) — FR 26 – 42 BALLAST TANK #11 (P) — FR 11 – 26 BALLAST TANK #11 (S) — FR 11 – 26 BALLAST TANK #12 (P) — STERN – FR 26 BALLAST TANK #12 (S) — STERN – FR 26 BALLAST TANK #13 (C) — STERN – FR 11	Ballast water	2225	m^3	Dependent on conditions upon delivery to recycling yard

DNV GL IHM approval process and survey

- Integrate digitised solution for IHM Green Server (IGS). DNV GL have developed software solution: the IHM Green Server (IGS) to support all aspects of IHM preparation, certification and maintenance. The IGS enables our customers to manage the enormous amounts of information required to meet future challenges.
- VSCP, IHM and HazMat Report will be checked and approved after the HazMat Expert has finished his work and submitted the documents to DNV GL
- Initial IHM Survey will be conducted after the documents are approved and stamped
- The Surveyor uses unified checklists for the on-board verification



DNV GL IHM life-cycle concept



IGS is a web based software application which enables shipowners to manage their IHMs for the fleet during the life cycle of the ships. IGS provides integrated and transparent IHM processing for shipyards and hazmat experts.

- Records results of document analysis
- Lists ship-specific material assumptions
- Includes the structuring ship systems
- Defines location, system, etc.
- Prepares Visual/Sampling Check Plan
- Documents sample and analysis results
- Prepares Part I of the IHM
- Provides a smooth certification process
- Gives access to all related data and its management
- Maintains the IHM throughout the ship's life
- Utilises data for ship recycling preparations

What does DNV GL offer?

- Practical experience of over 3500 issued certificates
- Training for Clients and HazMat Experts & Company approval scheme
- Software solution for easy IHM preparation & maintenance
- Global availability of DNV GL surveyors

List of approved HazMat expert companies						
	1	2	3	4	5	6
Group	AoSS	AoSS	AoSS	AoSS	AoSS	AoSS
Approval/Cert.no	AOSS0000BDN	AOSS0000DTB 5958712 HH	AOSS0000D7E	AOSS0000DTV	1395615 HH	5957912 HH
Company	Environmental Protection	Centre Testing International	Oesterbaai B.V.	Grieg Green AS	SGS-CSTC Standards Technical	Fortune Stone (FLZS) Co., Ltd.
Country	Greece	China	Netherlands	China	China	China
City	Piraeus	Shanghai	Rotterdam	Shanghai	Shanghai	Shanghai
Service	IHM preparation	IHM preparation and laboratory services	IHM preparation	IHM preparation	Laboratory services	IHM preparation
Contact	f.ploumitsakos@epe.gr; j.kondylis@epe.gr	pengyong@cti-cert.com	clemens.smits@kiwaoesterbaai.nl maritiem@kiwaoesterbaai.nl	allan.gao@grieggreen.com	rocco.hua@sgs.com	frank@sevensea.com.cn guangzhi.qian@f-stone.cn
	7	8	9	10	11	12
Group	AoSS	AoSS	AoSS	AoSS	AoSS	AoSS
Approval/Cert.no	3775312 HH	AOSS0000BGA	AOSS0000BGC	AOSS0000BGJ	AOSS0000C0S	AOSS0000CKB
Company	Wilhelmsen Ship	AB - Dr. A. Berg GmbH	Maritime Asbestos Solution B.V.	Poly NDT Pte. Ltd.	Metizoft Asia Pte. Ltd.	Suzhou FALAB Test Technology Co. Ltd.
Country	Malaysia	Germany	Netherlands	Singapore	Singapore	China
City	Kuala Lumpur	Hamburg	Rotterdam	Singapore	Singapore	Suzhou
Service	IHM preparation	IHM preparation	IHM preparation	IHM preparation	IHM preparation	Laboratory services
Contact	rick.power@wilhelmsen.com	berg@buero-drberg.de	iopstal@ma-solutions.nl	rendi@cti-cert.com	clement.chang@metizoft.com	yang.chen@falab.cn

	13	14	15
Group	AoSS	AoSS	AoSS
Approval/Cert.no	AOSS0000DDH	AOSS0000DSR	AOSS0000DFF
Company	Sea Sentinels Pte. Ltd.	Sanitas Milieukundig Adviesbureau B.V.	SGS Search Ingenieursbureau B.V.
Country	Singapore	Netherlands	Netherlands
City	Singapore	Barendrecht	Heeswijk-Dinther
Service	IHM preparation	IHM preparation	IHM preparation
Contact	rakesh@sea-sentinels.net	AC@sanitas-groep.nl	Wouter.Hagens@sgs.com

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Important steps towards sustainable ship recycling

Step 1 – Contract for ship recycling
In addition to the clause to meet the requirements as per the IMO HKC and/or the EU SRR and its guidelines, the IHM, SRFP, SRP, SoC and class survey statement (IRRC) should be listed above all. Moreover, an SRF monitoring programme should be mentioned.

Step 2 – Inventory of hazardous materials (IHM) preparation
The IHM needs to be ship-specific, should be prepared by a qualified expert and cover all 13 or 15 substances listed.

Step 3 – Ship recycling plan (SRP) development
The SRP should be developed acc. to MEPC.196(62), refer to a specific SRF, reflect the specific IHM and provide licensed disposal and recycling solutions for all materials listed in the IHM.

Step 4 – SRP approval process
The SRP requires Competent Authority (Recycling State) approval, explicit approval shall be with written notice of result and tacit approval shall specify the end date of a 14-day review period. An expert assessment of the SRP is recommended until the regulations are fully applicable.

Step 5 – Approved SRP
The SRF forwards the approved SRP to the ship owner. The SRP should contain the final version of the IHM.

Step 6 – Final survey by class
The final survey shall be conducted before the recycling activity starts. The survey guidelines (MEPC. 222[64]) should be followed. After the successful survey, an IRRC can be issued. The documents to be submitted for the survey include: the IHM (Parts I, II and III), the approved SRP and a copy of a valid SRF document of authorization of ship recycling (DASR).

Step 7 – Report and start of ship recycling
The SRF launches the start of the ship recycling with the submission of the IRRC to the CA. The process should be monitored by an independent expert if the SRF is not on the EU list of approved SRFs.

Step 8 Statement of Completion (SoC)
After completion, the SRF issues an SoC together with a report on accidents damaging human health and the environment and reports this to its client and CA. All involved stakeholders receive a copy of the SoC.

The benefits

- ✓To be in line with current and future Regulations
- ✓Prepare for compliance to regional requirements
- ✓Realize a higher resale value of the vessel
- ✓Maintain/Boost your image as a Green Company
- ✓Avoid the rush after entry into force
- ✓Integration to ISO Management System (ISO 14001)
- ✓Support onboard health and safety work
- ✓Enhancement of ship building quality - Asbestos and ODS free status

Questions from seminar

1. **What is regarded as a new build (need IHM from 190101)**

   Answer Effectively the keel laying date is dictating so if keel laying after 181231 a IHM is mandatory.

2. **How does the transition rules look like for ships currently with green passport.**

   Answer There is no standard solution here, but a reduction can be expected as a lot of work has been done. Generally 50% reduction.

3. **What is the situation at new building yards, are they aware of and have procedures for IHM?**

   Answer Based on DNV GL experience most yards have processes sin place for handling IHM requirements. Need to be careful to specify EU IHM.

4. **Can a company resource be assigned as hazmat expert**

   Answer Yes, it is not mandated to use approved provider. No requirement from DNV GL at least.

Thanks for Attention

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