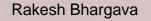


Inventory of Hazardous Materials Implications from EU Regulations



PROFESSION LIKE YOU.

Part of Wilhelmsen Maritime Services, a Wilh. Wilhelmsen group company

Professional. Like you.



AGENDA

WHAT IS IHM
WHY IS IT IMPORTANT
IHM FOR EXISTING VESSELS, NEW BUILDS AND MAINTENANCE
HOW WSM HANDLES IHM



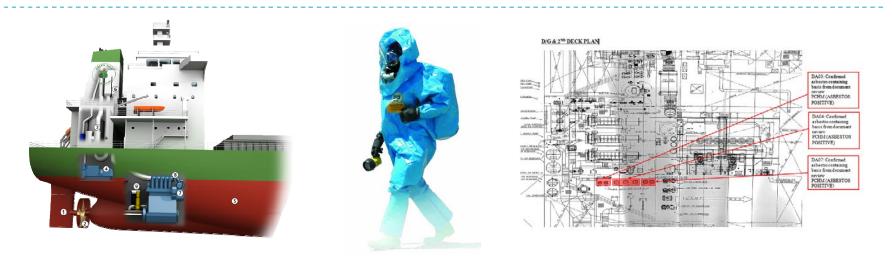
AGENDA

	WHAT IS IHM	
Image:		
	HOW WSM HANDLES IHM	



A detailed document outlaying all potentially hazardous material onboard a vessel

- Hazardous material is any substance that can pose a risk to the health and safety of people or to the environment as identified and listed by the Hong Kong Convention (2009)
- Inventory of Hazardous Material (IHM) is a document in which all potentially hazardous material onboard a vessel is identified, located and quantified and follows IMO Resolution MEPC.197(62) guidelines.





Hazardous material in table A is mandatory for all ships

No.		Materials		nventor	у	Threshold lovel
NO.		Materials	Part I	xno threshold levelxno threshold levelx		
A-1	Asbestos		х			no threshold level
A-2	Polychlorinated Biphenyls ((PCBs)	х			no threshold level
		CFCs	х			
		Halons	х			
		Other fully halogenated CFCs	х			
		Carbon Tetrachloride	х			
A-3	Ozone Depleting Substances	1,1,1-Trichloroethane (Methyl chloroform)	х			no threshold level
	Oubstances	Hydrochlorofluorocarbons	х			
		Hydrobromofluorocarbons	х			
		Methyl bromide	х			
		Bromochloromethane	х			
A-4	Anti-fouling systems containing organotin compounds as a biocide		x			2500 mg total tin/kg

TABLE A* Materials Listed in Appendix 1 of the Convention



Hazmat in table B is voluntary for existing vessels

TABLE B* Materials Listed in Appendix 2 of the Convention

No.	Materials		Inventor	у	Threshold level
NO.	iviale rais	Part I	Part II	Part III	Threshold level
B-1	Cadmium and Cadmium Compounds	Х			100 mg/kg
B-2	Hexavalent Chromium and Hexavalent Chromium Compounds	х			1 g/kg
B-3	Lead and Lead Compounds	х			1 g/kg
B-4	Mercury and Mercury Compounds	х			1 g/kg
B-5	Polybrominated Biphenyl (PBBs)	х			1 g/kg
B-6	Polybrominated Diphenyl Ethers (PBDEs)	х			1 g/kg
B-7	Polychlorinated Naphthalenes (more than 3 chlorine atoms)	х			no threshold level
B-8	Radioactive Substances	х			no threshold level
B-9	Certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, chloro)	х			10g/kg
	aterials in this Table with no threshold level, quantities occuring as unintention I Declarations and in the Inventory	onal trace o	contamina	ants shou	Ild not be listed in



Table C is included in the final stages of IHM at the end of a vessel lifecycle

TABLE C: Potentially Hazardous Items (to be listed in IHM Part II or III)

Nie	No. Properties		Goods	I	nventor	y	C-29			Bunkers: Fuel Oil		x
INO.	F	roperties	Goods	Part 1	Part 2	Part 3	C-30			Grease		х
C-1			Kerosene			х	C-31		Oiliness	Waste Oil (Sludge)	х	
C-2		Oillingage	White Spirit			х	C-32			Bilge	х	
C-3		Oliness	Lubricating Oil			х	C-33	Liquid		Oily Liquid Cargo Tank Residues	х	
C-4			Hydraulic Oil			х	C-34			Ballast Water	х	
C-5	-		Anti-seize Compounds			х	C-35			Raw Sewage	х	
C-6			Fuel Additive			х	C-36			Treated Sewage	х	
C-7		Colliness Oiliness Explosives/ Inflammables Green House Gases	Engine Coolant Additives			х	C-37			Non-Oily Liquid Cargo Residues	х	
C-8			Antifreeze Fluids			х	C-38	Gas	Explosibility/	Fuel Gas		v
C-9	Liquid		Boiler and Feed Water Treatment and Test			х		Gas	Inflammability	Fuel Gas		х
C-10			Re-agents De-ioniser Regenerating Chemicals	┝───		х	C-39			Dry Cargo Residues	х	
C-10			Evaporator Dosing and Descaling Acids			x	C-40			Medical Waste/Infectious Waste	X	\square
C-12			Paint Stabilisers/Rust Stabilisers			x	C-41			Incinerator Ash ¹⁾	х	
C-13			Solvents/Thinners			x	C-42			Garbage ¹⁾	Х	
C-14			Paints			x	C-43			Fuel Tank Residues	Х	
C-15			Chemical Refrigerants			х	C-45			Oily Solid Cargo Tank Residues	Х	
C-16			Battery Electrolyte			х	C-45			Oily/Contaminated Rags	Х	
C-17			Alcohol, Methylated Spirits			х	C-46			Batteries (incl. Lead Acid Batteries)		х
C-18			Acetylene			х	C-47		Solid	Pesticides / Insecticide Sprays		х
C-19		Explosives/	Propane			х	C-48		50110	Extinguishant		х
C-20			Butane			х	C-49			Chemical Cleaner (inc. Electrical Equipment		x
C-21			Oxygen			х	C-50			Cleaner, Carbon Remover) Detergent/Bleacher (could be a liquid)		
C-22	~		CO2			х	C-50			Miscellaneous Medicines		X
C-23	Gas		Perfluorocarbons(PFCs)			х	C-51			Fire fighting closing, equipment		x x
C-24		Green House	Methane	C-32			Dry Tank Residues	x	- ^			
C-25		Gases	Hydrofluorocarbon(HFCs)			х	C-54			Cargo Residues	X	
C-27			Nitrous Oxide(N2O)			х				Spare Parts which contain materials listed in	~	
C-28			Sulfur Hexafluoride(SF6)			х	C-55			Table A or Table B		х

1) Definition of Garbage is identical with that of MARPOL Annex V. However, incinerator ash is classified separately because it may include hazardous substances or heavy metals.



Table D covers "Exceptions" and is covered in part III

TABLE D[•] Regular consumable goods potentially containing Hazardous Materials

No.	Properties	Example	Inventory						
NO.	Fropenties	Example	Part I	Part II	Part III				
D-1	Domestic and accommodation appliances	Computers, refrigerators, printers, scanners, television sets, radio sets, video cameras, video recorders, telephones, consumer batteries, fluorescent lamps, filament bulbs, lamps			x				

• This Table does not include ship specific equipment integral to ship operations, which has to be listed in Part 1 of the Inventory



Thresholds levels under discussions

- A threshold level of 0.1% for asbestos with a relaxation clause allowing 1% was agreed
- A 5 year time limit was agreed
- Asbestos containing materials is determined by 0.1%, but 1% is allowed to use within 5 years after the Convention entry into force
- 50 mg/kg should be used as the threshold, as established under the Basel and Stockholm Conventions referring to the low persistent organic pollutants (POPs) content
- In accordance with regulation 4 of the Convention, for all ships, new installation of materials which contain PCBs shall be prohibited.
- It was generally agreed to establish a threshold level of 50 mg/kg for PBBs.
- No threshold value' is in accordance with the Montreal Protocol for reporting ODS.



Thresholds levels under discussions

Agreements and open issues - Cadmium, Chromium, Lead, Mercury, and PBDEs

No.	Materials		Inventor	Threshold level	
	Waterrais	Part I	P art II	P art III	
B-1	Cadmium and cadmium compounds	Х			100 mg/kg
B-2	Hexavalent chromium and hexavalent chromium compounds	х			1,000 mg/kg
B-3	Lead and lead compounds	х			1,000 mg/kg
B-4	Mercury and mercury compounds	Х			1,000 mg/kg
B-6	Polybrominated diphenyl ethers (PBDEs)	Х			1,000 mg/kg

- It was generally agreed to have a list of items containing radioactive materials, which will be included in the IHM Guidelines. – No threshold values
- Depends on the outcome of the correspondence with IAEA (International Atomic Energy Agency)



AGENDA

WHAT IS IHM	
WHAT IS IHM WHY IS IT IMPORTANT IMM FOR EXISTING VESSELS, NEW BUILDS AND MAINTENANCE HOW WSM HANDLES IHM	
HOW WSM HANDLES IHM	



IHM is mandatory

IHM (Hong Kong Convention 2009)	EU Regulation 1257/2013
Adopted at Diplomatic Conference in HK May 2009	Signed and approved by EU parliament and in force from Dec 2013. Earliest application Dec 2015
Aimed at regulating ship recycling	Aimed to facilitate early ratification of the Hong Kong Convention 2009 (within EU and outside EU countries)
Main items to be listed (asbestos, PCBs, ODS, TBT) from Table A, and others materials from Table B (heavy metals & radioactive substances)	Additional 2 new hazardous materials to be sampled (PFOS and HBCDD) apart from items in Table A and Table B.
Signed by 6 nations: Norway (ratified), Congo (ratified), France (ratified), Italy, The Netherlands, Saint Kitts & Nevis and Turkey	In line with HKC requirements with specifics for the EU region and EU-flagged vessels. Will be implemented without waiting for HKC ratification
Demands IHM for all vessels within 5 years of ratification and immediate for all vessels going for recycling	EU-flagged vessels of 500GT and over will be required to carry an IHM
States that vessel recycling should: "not pose any unnecessary risk to human health and safety or to the environment"	When calling EU ports, vessels from non-EU countries will also required to carry IHM onboard



The New HazMats

PFOS – Perfluorooctane Sulfonic Acid

- Use in Marine Industry
 - No specific investigation of PFOS-related chemicals' usage in marine industry is found. Based on survey out come of their general usage, their possibility of on board appearance is presumed low.
 - They are most probably found in interior textiles like apparel and leather, upholstery, carpet, curtains.
 - High concern could be paid on the following items regarding onboard materials and equipment - Rubber and plastic materials, i.e. cable sheath, PVC flooring, gaskets, seals, Coatings, i.e. paintings



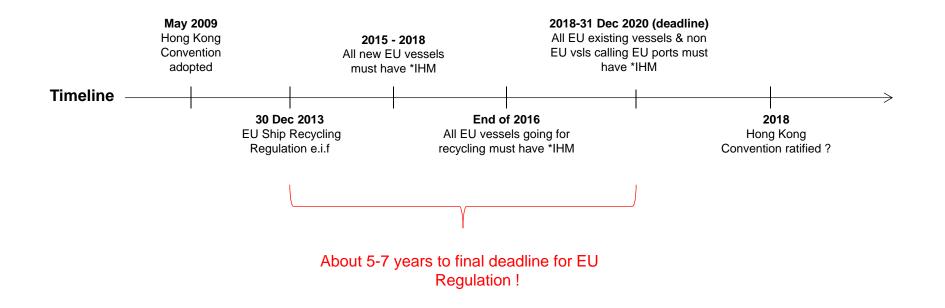
The New HazMats

HBCDD – Hexabromocyclododecane

- Use in Marine Industry
 - No specific investigation of HBCDD usage in marine industry is found. Based on survey out come of their general usage, high concern could be paid on the following items regarding onboard materials and equipment: They are most probably found in interior textiles like apparel and leather, upholstery, carpet, curtains.
 - High concern could be paid on the following items regarding onboard materials and equipment - Thermal insulation boards, in particular, foam materials. Rubber and plastic materials, i.e. cable sheath, PVC flooring, gaskets, seals. Coatings, i.e. paintings



IHM and EU Regulation timeline





IHM replaces Green Passport

Inventory of Hazardous Material

- Based on the IMO Hong Kong Convention (HKC)
- Focuses on 13 categories of HMs
- Requires survey, sampling and laboratory tests
- All HMs is identified, located and quantified
- Will be mandatory for all vessels



Green Passport

- Based on the Basel Convention which is being replaced by the HKC
- Focuses on 64 types of HMs
- Requires no sampling, surveys or tests
- Only states if a vessel has certain HMs or not
- Replaced by IHM soon





Enhanced control, higher sales value and compliance with CSR

Control & Commercial Interests

- Gives knowledge to what kind, where and how much of potential hazardous materials there is onboard your vessel
- Allows for proper safety measures and isolation
- Plan for removal at docking and increase sales price
- Higher ship value with controlled and certified vessel
- Avoid rush once the new regulation enters into force



Corporate Social Responsibility

- Mitigate environmental risks
- Show care for crew and other people working with the vessel
- Early compliance with new regulation
- Avoid negative publicity and NGO attention
- Necessary preparation for green recycling





AGENDA

WHAT IS IHM	
WHY IS IT IMPORTANT	
HOW WSM HANDLES IHM	



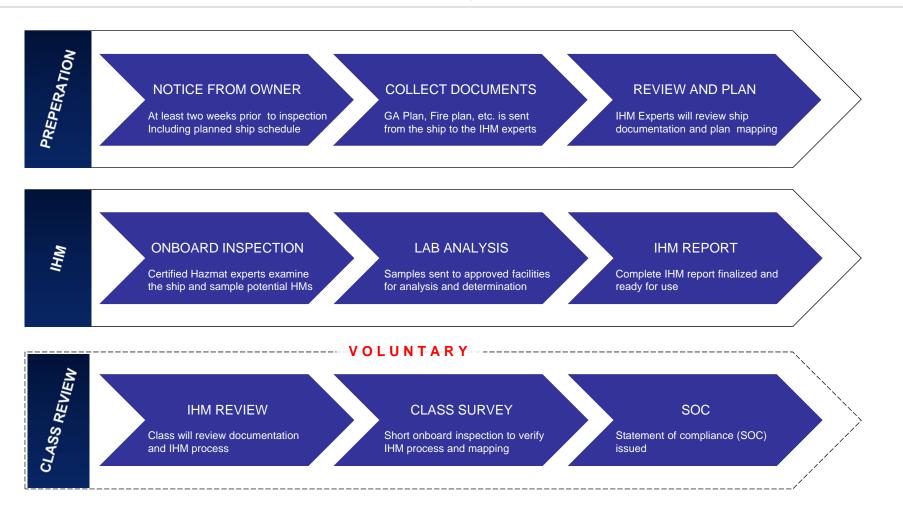
An inventory of hazardous materials in the ship structure and equipment is first priority for all vessels

- IHM is divided in three parts:
 - I. Ship's structure and equipment
 - *II.* Operationally generated wastes
 - III. Stores
- Part I is handled either during the construction for new vessels or during operation for existing vessels
- Part II and III are developed at the end of the vessel life shortly before it is recycled
- Table A is mandatory for all existing and new vessels while table B is only compulsory for new buildings
- Table C and D are only required for part II and III

Scope of the inventory of hazardous materialsTable A MaterialsAsbestos, PCBs, Ozone depleting substances and organotin compoundsTable B MaterialsHeavy Metals (i.e. Lead, Mercury, Radioactive substances)Table C MaterialsLiquids, Gases, SolidsTable D Materials	Shipbuilding & operating	Preparation prior to recycling					
	Part I Structure and Equipment	Part II Operative waste	Part III Stores				
Table A Materials							
depleting substances and							
Table B Materials							
Mercury, Radioactive							
Table C Materials							
Liquids, Gases, Solids			\checkmark				
Table D Materials							
Regular consumer goods potentially containing hazardous materials	List of exclusions						



IHM for existing vessels takes 3-6 weeks depending on vessel schedule and availability



VSCP SAMPLE



Detailed Visual Sampling Check Plan (VSCP) for onboard inspection requiring a minimum of 80+ samples

Pice Pice Control Cont															ΠГ					
company		Visual / Sampling Check Plan		List of equipment, system an	nd/or area for Visual Check					List of paints, equipment, see	stem and/or area of Sameling Cherk					List of equipment, system and/or a	area classed as PCHM			
	Name of ship					ck and confirm the items of attached Asset	ament of col	elected information		Location	Paints, equipment, Machinery and/	for Name of parts	Materials	Result of Doc.		Location Eq.	upment, Machinery and/or zon	e Name of parts		Checking
	Fieg	PANAMA		for "XXXXXX" and refer to atta	ached Location diagram of Hazardous	Materials for "000000". Particularly about	following uni	nknown items,			2008			Checking						_
	Type of Ship	SINGLE DECK TYPE LPG/ AMMONIA CARRIER		check and confirm its spare	e parts of gaskets and packing, and se	earch the unknown locations.						Exheust gas pipe lagging (engine side)	Astestos	Unknown		Defects attached Accessed of	enterted information for WWW	Of and I confirm discourse of Marine	the state of the s	-
	IMO Number			Location	Environment Machinery and/or zone	Name of natis	Materials	Result of Doc.			Main Engine	Exhaust gas pipe lagging (yard side)	Asbestos	Unknown		Nere to execting Assessment of	contrasts morning on 2000	or and consolition diagram of Plaza		10
	Gross Tonnege	47,048 GT									Hyundei - Men B&W (6880MC-C)		Ashering	Helmon						
	Lpp x Bmid x Dmid	215.00 x 36.60 x 22.00 MTS									Marine Diesel Engine Equipped with							e development of the inventory of		
	Date of Delivery	16TH. OCT. 2008		ER 2hd Dk (Engine control						Engine room 3rd Dk	Exhaust Gas Turbo-Charger	Turbocharger legging material (yard side	Asbestos)	Unknown		Hazardous Materials (MEPC.179)	(62))			
	Ehipbuilder	HYUNDAI HEAVY INDUSTRIES CO., LTD., ULSAN, SOUTH KOREA		(ball)								Fuel pipe legging material	Asbestos	Unknown						en the
	Ship Owner	CAMONILE MARITIME S.A., PANAMA.		Engine room		Insulation	Asbestos	Unknown											contract day is ne	
					Main Transformer						DE Generator	Exhaust pipe legging (engine side)	Asbestos	Unknown						Convention
												Exhaust pipe legging (yard side)	Asbestos	Unknown						
	Contact Point (TEL,FAX, E-Mail, Address)			Emergency Generator	Emergency Transformer	Insulation Oil				-		to an effect of the second second		Halanaa						
				Boet Deck	Lifeboat	Bettery	Lead	Unknown			Aux Boiler	Legging (Engine side)	ABORNES	Unknown		Damared by - Mr. Armen Abdul &	kale			
						Insulation				Engine room 2nd Dk		Legging (Yard side)	Asbestos	Unknown		Prepared by : Mr. Acrian Abdul A	402			
	Check Schedule			Throughout accommodation	water coolers	Cooling agent, Refrigerants	HOFCICEO	C Unknown			Dulithead adjacent to 900	In the first	A . h	Halanaa				-		
				Nevigation Bridge Deck	Battery Room	Battery	Lead	Unknown			Concerns adjected to DUR					E-Mail : Azmen Abdul-Aziz@with	eimsen.com	-		
					Emergency Generator Room	Battery	Lead	Unknown				Gesket, pecking	Asbestos	Unknown				-		
						Compass bowl				ER casing	Incherator	Insulation	dahaat	Unknown						
Comp of point Comp of			1 1										-			Preparation date of Plan	: 05th August 2013 / Wilhelm	sen Ship Management Malaysia.		
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	Chemical analyst										Air Con. Compressor	Gasket and packing	Asbestos	Unknown						
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										Main Deck	-									
Randpart Standpart Standpart <th< td=""><td>Chemical analysis method</td><td></td><th></th><td></td><td></td><td></td><td></td><td></td><td>Providen Refty, Cong Ar Con Compresson Hose Hunding Chine Providen Comp Ceops pilping Windles and windhes</td><td>Provision Crane</td><td>Brake lining</td><td>Asbestos</td><td>Unknown</td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Chemical analysis method								Providen Refty, Cong Ar Con Compresson Hose Hunding Chine Providen Comp Ceops pilping Windles and windhes	Provision Crane	Brake lining	Asbestos	Unknown							
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Visual documentation obtained here from the bridge and the accommodation area





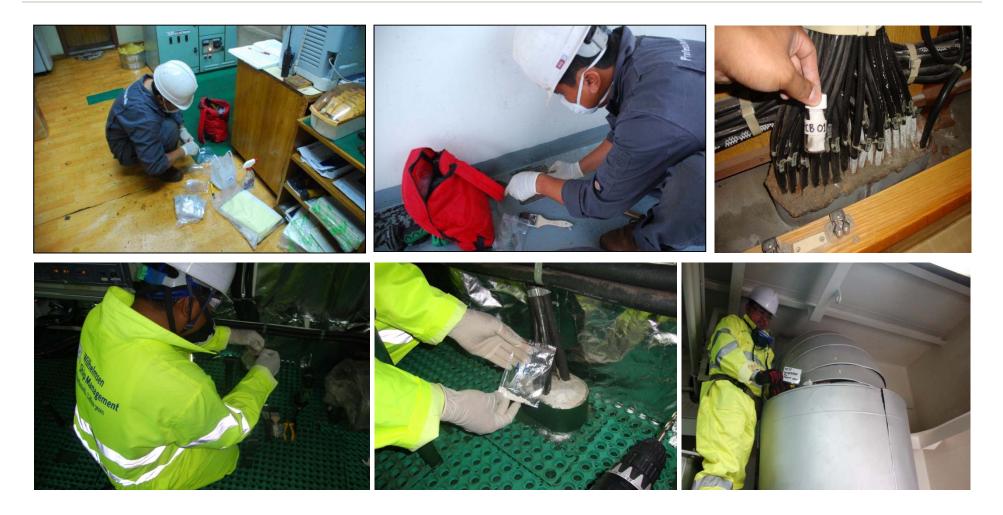




ONBOARD INSPECTION II



Samples are gathered and clearly marked, here from the ECR, ER and Main Deck



ONBOARD INSPECTION III

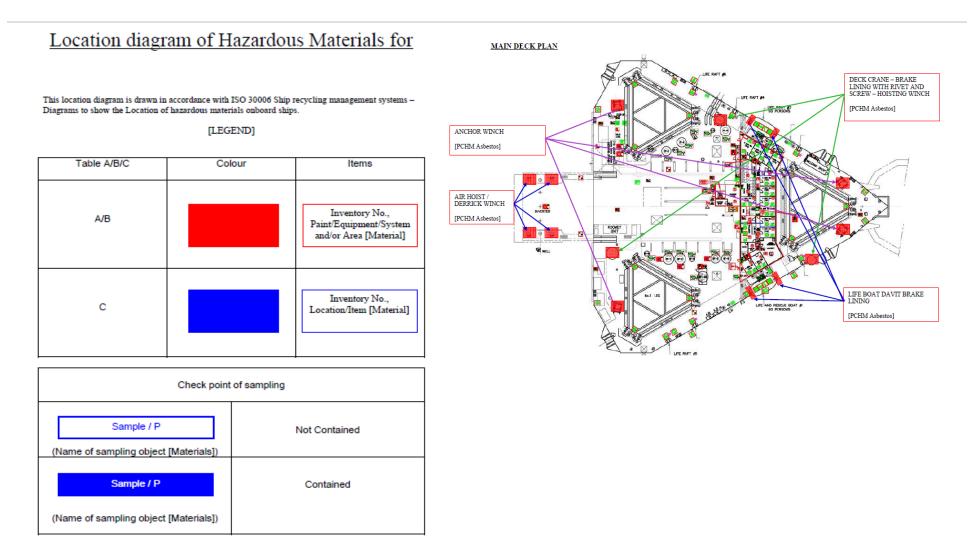


Equipment types and models are verified against original documentation, here from the Engine Room





IHM Report – Sample of Location Diagram





IHM Report – Sample of the report content

WILHELMSEN SHIP MANAGEMENT



PICTURES FROM THE ASBESTOS SURVEY

Sampling





 Figure 3. Sample A03: Mess room. Deck floor
 Fit

 covering. Grey soft powder material
 ins

 Thickness: 30mm.(NO ASBESTOS)
 Th

Figure 4. Sample A04: Hospital. Wall panel insulation. Yellow soft fibres material. Thickness: 15mm. (NO ASBESTOS) WILHELMSEN SHIP MANAGEMENT



PICTURES FROM PCB SURVEY

Sampling



SOC / SOF



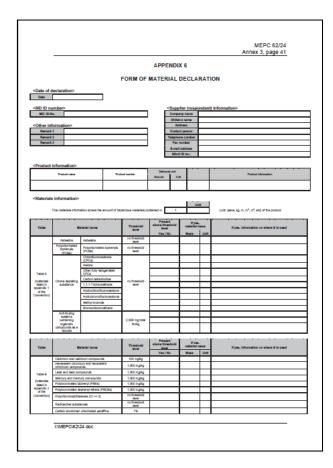
We work with all the major classification societies and will offer free liaison until SoC completion

RAIJ/	Form 130 SR/ES/60F
Classie	NIPPON KAIJI KYOKAI
Statement of Fact	
No.KC11N3-040	Date: 4 Aug. 2011
THIS IS TO CERTIFY that NIPPON KAIJI KYOKAI did, at the request of examine the report of "INVENTORY OF HAZARDAOUS MATERIALS Part I" of the following vessel:	
-	
Signal Letters Port of Registry Gross Tonnage IMO Number IMO registered owne IMO company ID nu Date of Construction Name and address o	mber : n : 15 May 2006
in accordance with paragraph 4.2 of IMO Resolution MEPC 179(59) "GUIDELINES FOR THE DEVELOPMENT OF THE INVENTORY OF HAZARDOUS MATERIALS", and found satisfactory.	
	Nippon Kaiji Kyokai
	T. Nagatome
	General Manager of Marine & Industrial Service Department
Attachment: Inventory of Hazardous	s Materials for
whatever to be held responsible for any inacca	tes in in endentende alle apped part tell her his Society nor any of its Contra these is under any concentrations may a my segment and another than the society mis Society of its Xeropolis of it any only only in the Recent or other largement, default or negligance of its Officiers, Sarreyous or Agents.



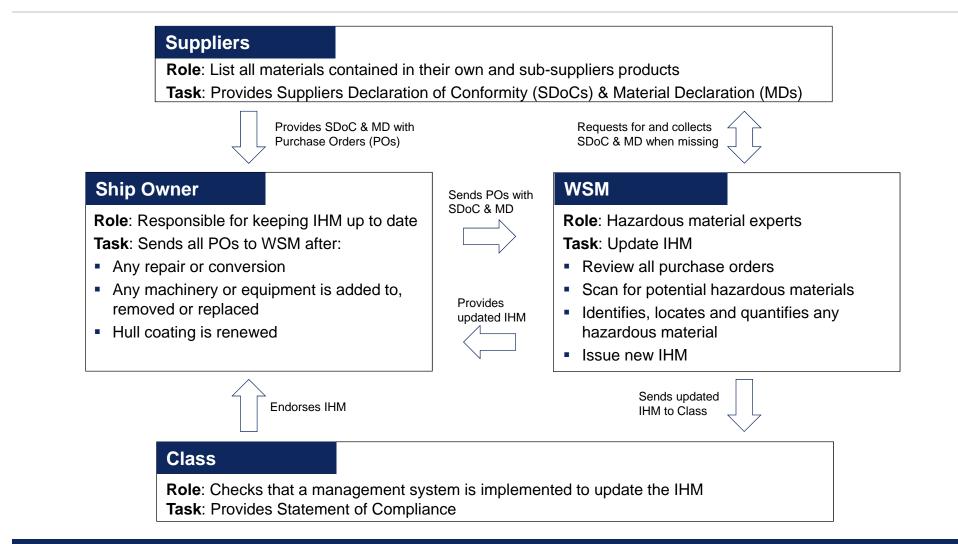
Suppliers provide detailed material declarations providing necessary input to prepare IHM

- IHM process while vessel is being built:
 - 1. Identify all suppliers
 - 2. Request for and collect Suppliers Declaration of Conformity (SDoC) and Material Declaration (MD) for all products
 - 3. Screen the products containing Hazardous Materials above threshold level
 - 4. Identify the location of these products and calculate the mass of Hazardous Materials at each location
 - 5. Prepare IHM in the standard format
- Using a software, we are able to simplify data collection and enhance efficiency in the IHM process
- If suppliers are unable to produce MD and SDoC, WSM provides analysis to verify the contents of your equipment





WSM Hazmat experts ensures proper IHM maintenance





AGENDA

WHAT IS IHM
WHY IS IT IMPORTANT
IHM FOR EXISTING VESSELS, NEW BUILDS AND MAINTENANCE
HOW WSM HANDLES IHM



WSM is part of the Wilhelmsen group, one of the worlds largest maritime networks

Who we are

- Wilhelmsen Ship Management (WSM) is a subsidiary of Wilhelmsen Maritime Services, a Wilh. Wilhelmsen group company
- One of the largest third party ship managers with more than 450 vessels on crew and technical management
- 7 Ship management offices and 19 crew offices worldwide

Our range of services

- Full technical management
- Crew management
- Vessel inspections and audits
- IHM / Green Passport
- Green recycling
- Lay-up
- Dry Docking
- Insurance services
- Maritime training











WSM is an experienced and certified IHM expert working with all the major classification societies

What we do

- Wilhelmsen Ship Management (WSM) can offer IHM and IHM maintenance for all vessels anywhere in the world
- We have worked with all the large classification societies and vessels varying from traditional bulkers and tankers to more advanced specialised ships and offshore installations

What makes WSM different

- WSM has a strong IHM team with many certified experts, allowing us to handle IHM in an efficient, flexible and economical manner
- We offer a fixed competitive price for our services and should you decide for a Statement of Compliance from your classification society, we will facilitate and offer free liaison with class until completion



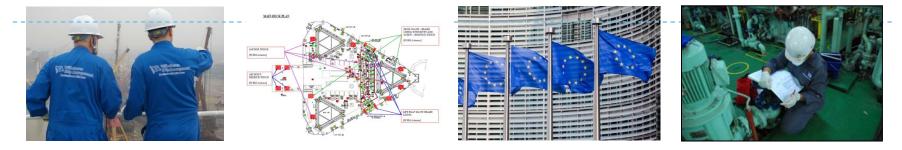


WSM has provided IHM for a wide variety of traditional and more advanced vessels and offshore installations



WSM – a class certified expert providing IHM - all types of vessels (existing and new) anywhere in the world

- Inventory of Hazardous Material (IHM) is a document in which all potentially hazardous material onboard a vessel that can pose a risk to the health and safety of people or to the environment is identified, located and quantified
- IMOs Hong Kong Convention (2009) will make IHM mandatory for all vessels once ratified over the next few years while new EU regulation makes IHM compulsory for all new and vessels visiting European ports from 2015 – 2018
- Wilhelmsen Ship Management (WSM) is a certified IHM expert with a strong team in place allowing us to handle IHM for both new and existing vessels in an efficient, flexible and economical manner
- Existing vessels require on board inspection and laboratory analysis and can be completed in 3-6 weeks depending on vessel schedule and availability
- WSM provides an easy and reliable procedure to make sure your IHM maintains up to date
- WSM has worked with all the large classification societies especially with Class NK and vessels varying from traditional bulkers and tankers to more advanced specialised ships and offshore installations.



Wilhelmser

Ship Management



Part of Wilhelmsen Maritime Services, a Wilh. Wilhelmsen group company

Professional. Like you.