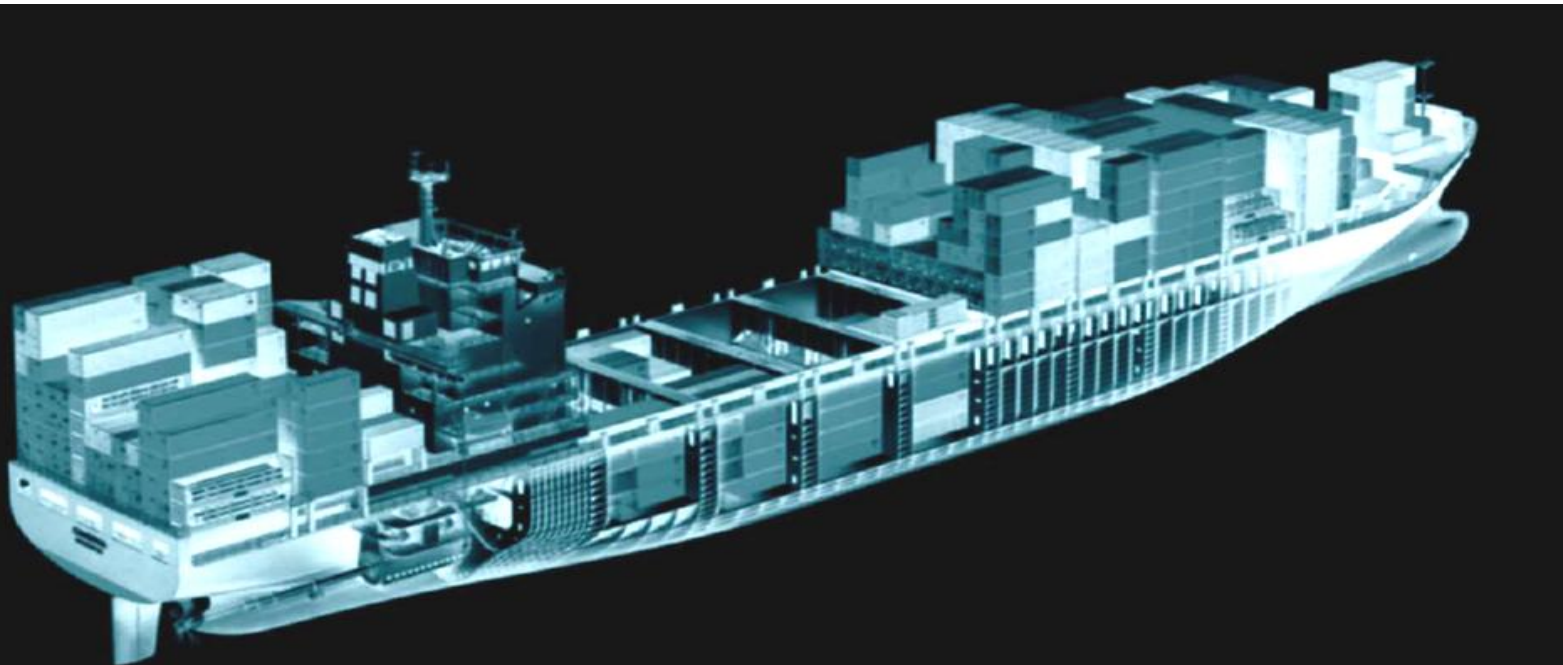


Germanischer Lloyd



**Challenges for the shipping industry out of upcoming IMO convention
Preparation of the Inventory of Hazardous Materials on board of existing and
new building ships**



Know what's inside your ship!

Content

Introduction

Hong Kong Convention

Inventory of Hazardous Materials (IHM)

Preparation of IHM for New Ships

- Tasks for Shipyards
- Tasks for Suppliers

Preparation of IHM for Existing Ships

Summary

Introduction

Ships are likely contain hazardous materials

- e.g. Asbestos, PCB, Ozone Depleting Substances, Organotin Compounds

Lack of proper SRY practices

- Mostly low Occupational Health & Safety and Environment conditions in main SRY countries
- Documentation of HazMat presence **is not regulated today!**

Increasing public and political pressure

Development of legally binding instrument

- Joint Working Group (IMO/ILO/Basel Convention, 2005-08):
“International Convention for the Safe and Environmentally Sound Recycling of Ships“

Hong Kong Convention

legally binding as like SOLAS, MARPOL, etc.

- Adoption: May 2009
- Start of ratification: September 2009
- Final IHM-Guideline: July 2009
- Entry into force*: ~ 5 years (?)

* entry into force conditions: 40% of world merchant fleet represented by at least 15 flag states plus 3% of ship recycling capacity of signing merchant fleet (~10mio. GT)

Facility Guideline under development, adoption by IMO estimated to take place at MEPC.62, July 2011



Hong Kong Convention

The only available ship recycling specific legislation

Applicable to

- New* & existing ships** > 500GT
- New installations on ships > 500GT
- Ship recycling facilities

Exclusions

- Government ships in non-commercial service
- domestic vessels >500 GT
(Art. 16.6, depending on flag state decision)



* New ship: building contract on/after EiF, or keellaying 6 months after EiF
or delivery 30 months after EiF

** Existing ship: not a new ship

Inventory of Hazardous Materials (IHM)

- **Part I: hazardous materials in structure & equipment**
 - existing ships: Preparation by HazMat expert on behalf of shipowner
 - new ships: Preparation by ship building yard
- Maintenance required in case of changes by shipowner/designated person
- To be certified min. every 5 years by Recognized Organisation (RO)
- Part I to be checked by PSC frequently

- **Part II (wastes) & III (stores)** required only prior to recycling
- Major source of information for ship recycling plan and selection of ship recycling facility



Inventory of Hazardous Materials (IHM)

For new ships Table A and Table B have to be considered for the IHM

Scope of the inventory of hazardous materials	Shipbuilding and operating	Preparation prior to recycling	
	Part I Structure and Equipment	Part II Operative Wastes	Part III Stores
Table A Materials Mandatory for new/existing ships and new installations	✓		
Table B Materials Mandatory for new ships/installations; voluntary for existing ships	✓		
Table C Materials Potentially hazardous items		✓	✓
Table D Materials Regular consumer goods potentially containing hazardous materials	List of exclusions		✓

Inventory of Hazardous Materials (IHM)

Table A: Hazardous Materials (mandatory for all ships)

TABLE A* Materials Listed in Appendix 1 of the Convention

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

Inventory of Hazardous Materials (IHM)

Table B: Hazardous Materials (mandatory for new ships and new installations, voluntary for existing ships)

TABLE B* Materials Listed in Appendix 2 of the Convention

No.	Materials	Threshold level
B-1	Cadmium and Cadmium Compounds	100 mg/kg
B-2	Hexavalent Chromium and Hexavalent Chromium Compounds	1 g/kg
B-3	Lead and Lead Compounds	1 g/kg
B-4	Mercury and Mercury Compounds	1 g/kg
B-5	Polybrominated Biphenyl (PBBs)	1 g/kg
B-6	Polybrominated Diphenyl Ethers (PBDEs)	1 g/kg
B-7	Polychlorinated Naphthalenes (more than 3 chlorine atoms)	no threshold level
B-8	Radioactive Substances	no threshold level
B-9	Certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, chloro)	10g/kg

* For materials in this Table with no threshold level, quantities occurring as unintentional trace contaminants should not be listed in Material Declarations and in the Inventory

Preparation of IHM for New Ships

Ship Yards:

- Acquiring, Collecting and Structuring of information
- Preparing ship specific Inventories (Table A & B)

Manufacturer / Supplier:

- Providing information
(Suppliers Declaration of Conformity
& Material Declarations)
- *“Shipowner shall consider IHM preparation in ship building contract with the shipyard”*



Preparation of IHM for New Ships

Tasks for the Suppliers:

Providing information on presence of Hazardous Materials contained in their components in form of MD and SDoC to shipyards
evaluation of their products in a detailed way

Own data / knowledge

- responsibility lies with the “first writer”

Using external knowledge for own products:

- involvement of supply chain (Tier 2 to Tier n suppliers)

Supplier's Declaration of Conformity for Material Declaration Management

1) SDoC No.: _____

2) Issuer's name: _____
Issuer's address: _____

3) Object(s) of declaration: 1) _____
2) _____
3) _____
4) _____

4) The object(s) of the declaration described above is/are in conformity with the following documents:

5) Applicable Regulations or other stipulated requirements and documents

Document No.	Title	Edition	Date of issue

6) Additional Information:

Signed for and on behalf of: _____

Place of issue: _____

Date of issue: _____

7) Name, function: _____ Signature: _____

Material Declaration

<Date of declaration>: _____
Date: _____

<MD ID number>: _____

<Supplier independent information>

Company name	_____
Street address	_____
City	_____
Telephone number	_____
Fax number	_____
E-mail address	_____
Web site	_____

<Other information>

Material name	_____
Material number	_____
Material description	_____
Material quantity	_____
Material unit	_____

<Product information>

Product name	_____	Product number	_____	Delivery unit	_____	Product information	_____
Material group	_____	Material code	_____	Material code	_____	Material code	_____

<Material information>

This material information shows the amount of hazardous materials contained in _____

Type	Material name	Threshold value	Amount above threshold value			If yes, information on where it is used
			kg	liters	l	
Page 1: Hazardous materials	Asbestos	<0.1 mg/m³	Yes	0.0	0	0001
	Polychlorinated biphenyls (PCBs)	<0.1 mg/kg	Yes	0.0	0	0001
	Chlorinated paraffins (CPs)	<0.1 mg/kg	Yes	0.0	0	0001
	Polycyclic aromatic hydrocarbons (PAHs)	<0.1 mg/kg	Yes	0.0	0	0001
	Other heavy metals	<0.1 mg/kg	Yes	0.0	0	0001
	Other light metals	<0.1 mg/kg	Yes	0.0	0	0001
	Other organic substances	<0.1 mg/kg	Yes	0.0	0	0001
	Other inorganic substances	<0.1 mg/kg	Yes	0.0	0	0001
	Other hazardous materials	<0.1 mg/kg	Yes	0.0	0	0001
	Other hazardous materials	<0.1 mg/kg	Yes	0.0	0	0001
Page 2: Hazardous materials	Explosives	<0.1 mg/kg	Yes	0.0	0	0001
	Flammable liquids	<0.1 mg/kg	Yes	0.0	0	0001
	Flammable solids	<0.1 mg/kg	Yes	0.0	0	0001
	Flammable gases	<0.1 mg/kg	Yes	0.0	0	0001
	Flammable aerosols	<0.1 mg/kg	Yes	0.0	0	0001
	Highly flammable	<0.1 mg/kg	Yes	0.0	0	0001
	Corrosive	<0.1 mg/kg	Yes	0.0	0	0001
	Other hazardous materials	<0.1 mg/kg	Yes	0.0	0	0001
	Other hazardous materials	<0.1 mg/kg	Yes	0.0	0	0001
	Other hazardous materials	<0.1 mg/kg	Yes	0.0	0	0001

Legend: Yes: The material is present in the product. No: The material is not present in the product. 0.0: The amount of the material is below the threshold value. 0: The amount of the material is zero.

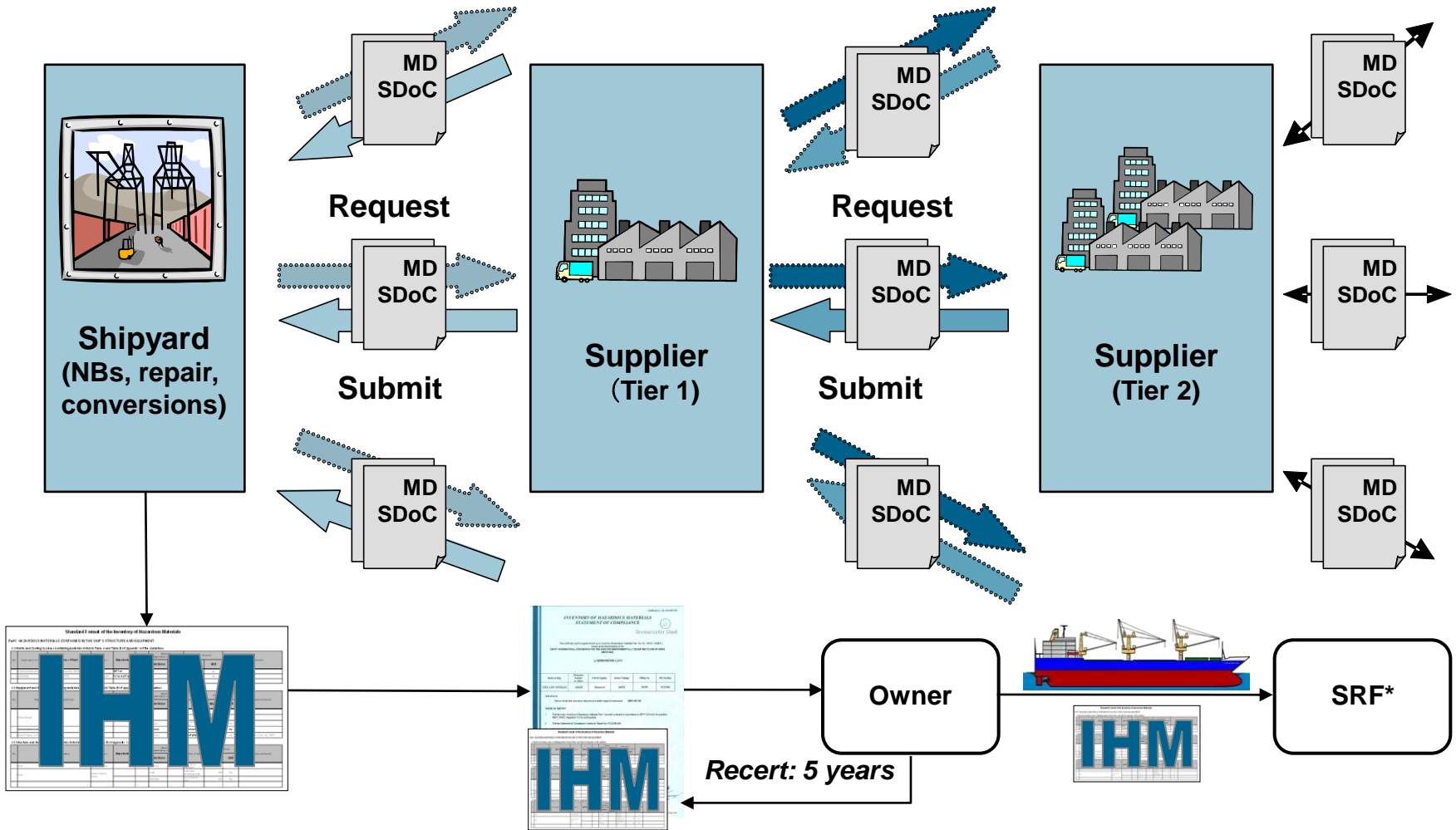
SDoC - Form

MD - Form



Preparation of IHM for New Ships

Information from Supply Chain (MD SDoC)



Suppliers Declaration of Conformity (SDoC)

- legal statement prepared by Supplier
- specifies object of MD declaration
- lists organizational measures assuring correct MD-preparation (e.g. ISO Certification)
- if applicable SDoC of supplier should contain statement on RoHS* conformity, MD still has to be provided!
- The SDOC must be valid as long as “the product lives on board”
- **No handwritten SDoCs**

**Supplier's Declaration of Conformity
for Material Declaration Management**

1) SDoC No.: _____

2) Issuer's name: _____
Issuer's address: _____

3) Object(s) of declaration: 1) _____
2) _____
3) _____
4) _____

4) The object(s) of the declaration described above is/are in conformity with the following documents:

5) Applicable Regulations or other stipulated requirements and documents

Document No.	Title	Edition	Date of issue
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

6) Additional Information:

Signed for and on behalf of: _____

Place of issue

Date of issue

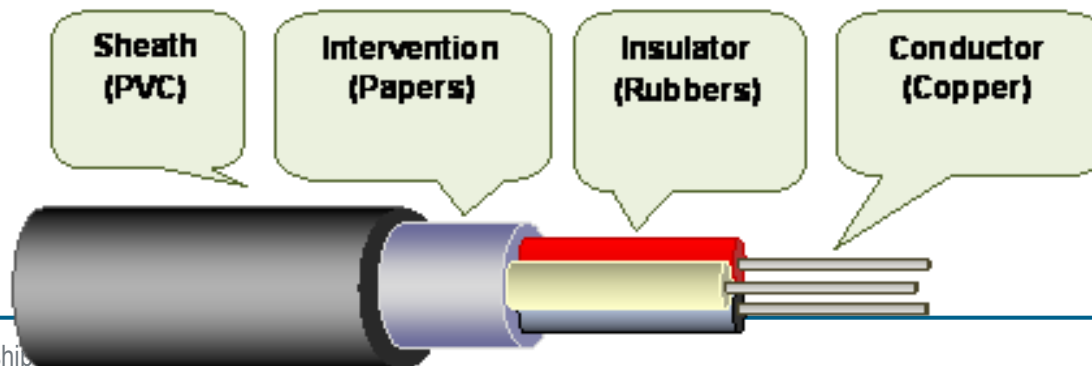
7) _____

Name, function Signature

Material Declaration (MD)

(for new ships and new installations)

- Documentation of presence of Hazardous Materials from table A and B
 - homogenous material criteria for threshold levels
 - “RoHS-conform” electronic components
 - Materials of B1-B6 restricted by RoHS-documentation has to be at hand
 - Materials of B7-B9 to be investigated in detail
 - if YES: mass of the HazMats and “location / part of use” and its “mass” is required
 - if NO: MD still has to be prepared and provided to customer



Material Declaration (MD)

(for new ships and new installations)

- To be prepared by Tier 1 Supplier
- Documentation on presence of Hazardous Materials in supplied components
- content of MD impacts the ships IHM
- “homogenous material” criterion for threshold levels
- **No handwritten MDs**

Material Declaration

<Date of declaration>
 Date: 2008-02-25

<MD ID number>
 MD-ID-No.: 0035-2008

<Supplier (respondent) information>

Company name	Suppliercompany Ltd.
Division name	Manufacturing Line Machines
Address	Musterstrasse 99
Contact person	Peter Muelemann
Telephone number	0049-123456789
Fax number	0049-987654321
E-mail address	peter.muelemann@suppliercompany.td.com
SDS-C ID-No.	NAM-002-2008

<Other information>

Remark 1	
Remark 2	
Remark 3	

<Product information>

Product name	Product number	Delivered unit		Product information
		Amount	Unit	
Motorengine Type 44-10	99909-2008-01	10,000	kg	

<Material information>

This materials information shows the amount of hazardous materials contained in

1	piece
---	-------

 Unit

Table	Material name	Threshold level	Present above threshold level		If yes, material mass	If yes, information on where it is used	
			Yes/No	Mass			Unit
Table A (available listed in appendix 1 of the Convention)	Asbestos	no threshold level	No				
	Polychlorinated biphenyls (PCBs)	no threshold level	Yes	100	g	cables	
	Ozon depleting substance	Chlorofluorocarbons (CFCs)	no threshold level	No			
		Halons		No			
		Other fully halogenated CFCs		No			
		Carbon tetrachloride		No			
		1,1,1-Trichloroethane		No			
		Hydrochlorofluorocarbons		No			
		Hydrobromofluorocarbons		No			
	Methyl bromide	No					
Bromochloromethane	No						
Anti-fouling systems containing organotin compounds as a biocide	2,500 mg total tin/kg	No					

Table	Material name	Threshold level	Present above threshold level		If yes, material mass	If yes, information on where it is used
			Yes/No	Mass		
Table B (available listed in appendix 2 of the Convention)	Cadmium and cadmium compounds	100 mg/kg	Yes	200	g	
	Hexavalent chromium and hexavalent chromium compounds	1 g/kg	No			
	Lead and lead compounds	1 g/kg	Yes	5,000		
	Mercury and mercury compounds	1 g/kg	No			
	Polybrominated biphenyl (PBBs)	1 g/kg	Yes			
	Polybrominated diphenyl ethers (PBDEs)	1 g/kg	No			
	Polychlorinated biphenyls (PCBs) (CI >= 3)	no threshold level	No			
	Radioactive substances	no threshold level	Yes	50		
	Certain short-chain chlorinated paraffins	10 g/kg	No			

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Relationships between Material Declaration (MD) and Suppliers Declaration of Conformity (SDoC)

	SDoC covers 1 <u>purchase</u>	SDoC covers 1 <u>product</u>	SDoC covers 1 <u>company</u>
	A supplier shall submit a SDoC for every delivery (at the 1st, 2nd and 3rd purchase).	A supplier shall submit a SDoC when he supplies products that aren't covered by the previously submitted SDoC.	A supplier shall submit a SDoC at start of business (with 1st purchase). The SDoC covers all future purchases incl. 1st purchase.
1st purchase	<p>MD covers SDoC Product A X 50 pieces</p>	<p>MD covers SDoC Product A X 50 pieces</p>	<p>MD covers SDoC Product A X 50 pieces</p>
2nd purchase	<p>MD covers SDoC Product A X 30 pieces</p>	<p>MD covers SDoC Product A X 30 pieces</p>	<p>MD covers SDoC Product A X 30 pieces</p>
3rd purchase	<p>MD covers SDoC Product B X 20 pieces</p>	<p>MD covers SDoC Product B X 20 pieces</p>	<p>MD covers SDoC Product B X 20 pieces</p>

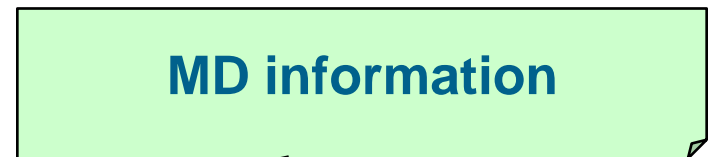
This is the current status of the SDoC system in electronic and automotive industry.

Background Information for Preparation of IHM for new ships

Input of MD for IHM

Shipyards have to prepare ship specific IHM for newbuilds > 500GT

- on basis of suppliers information (MD & SDoC)
- by assignment of locations / systems



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

No.	Name	Location*1	Manufacturer	MD-ID No.	Materials (classification in Appendix 1)	Appx. Quantity		Parts of Use	Remarks
						Mass	Unit		
1	Switchboard	Engine control room	Ozea Switch Co. Ltd	14-2009	Cadmium	0.02	Kg	Housing coating	Less than 0.01kg
					Mercury	<0.01	Kg	Heat gauge	
2	Diesel Engine, xx Co, xx #200	Engine room	City Engine Corp.	03112008-01	Cadmium	0.01	kg	Bearing	
3	Diesel generator (x3)	Engine room	City Engine Corp	03112008-02	Lead	0.01	kg	Ingredient of copper compounds	

IHM for Existing Ships

Documentation is not systematically available

Basis is a investigation on the as-build basis

Substances listed in Table A

Challenge:

Costs of IHM are not considered during building and operational phase of a ship

Information needed for the recycling of the ship

Experience shows HazMat in many unexpected components/ areas

Development process for IHM Part I

Preparation of an Inventory Part I for existing ships

- **documents of the individual ship**
- **general knowledge of ship technology and equipment**

Close attention should be paid to:

- **the variations of each type of ship (consider conversions)**
- **the age of ship**

Experience:

- **Hazardous Materials on a ship varies heavily from ship to ship**

Conducting the right Steps

Step1: Collection of necessary information, Utilization of Indicative List

Step2: Assessment of Collected Information

Step3: Preparation of Visual/Sampling Check Plan

Step3a: Approval / amendment of Visual/Sampling Check Plan by Recognised Organisation (Class) prior to step4

Step4: Onboard Visual/ Sampling Check
Samplings have to analysed in a recognised laboratory

Step5: Preparation of IHM Part I and related Documentation

Step5a: R.O. to certify / request amendment to the IHM

Step5b: Delivery of IHM Part I (to customer)

Summary: Preparation of IHM

- IHM preparation will be mandatory soon
- IHM and MD requirements clearly defined by IMO
- IHMs more often ordered today (FiS & NB)
- suppliers receive requests in an non-standardized manner
- Electronical solution needed
- IHM entries depend solely on suppliers MDs
- each IHM requires hundreds / thousands of MDs
- Existing Ships get different IHM (Table A, prepared sample/ laboratory basis)

Thank you!



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Know what's inside the ship

