大连船舶重工集团有限公司
DALIAN SHIPBUILDING INDUSTRY CO., LTD.

Inventory of Hazardous Materials

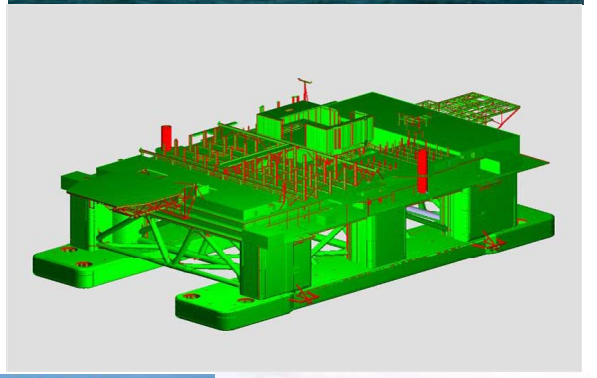
Dalian Shipbuilding Industry Co. Ltd
-- Guan Yinghua

Dalian Shipbuilding Industry Co. Ltd

- Over 110 year's history
- Nowadays Consists of Nos 1-3 Yards and offshore Yard
- Capacity: delivery of about 40 vessels with production turnover of 5-6 million DWT

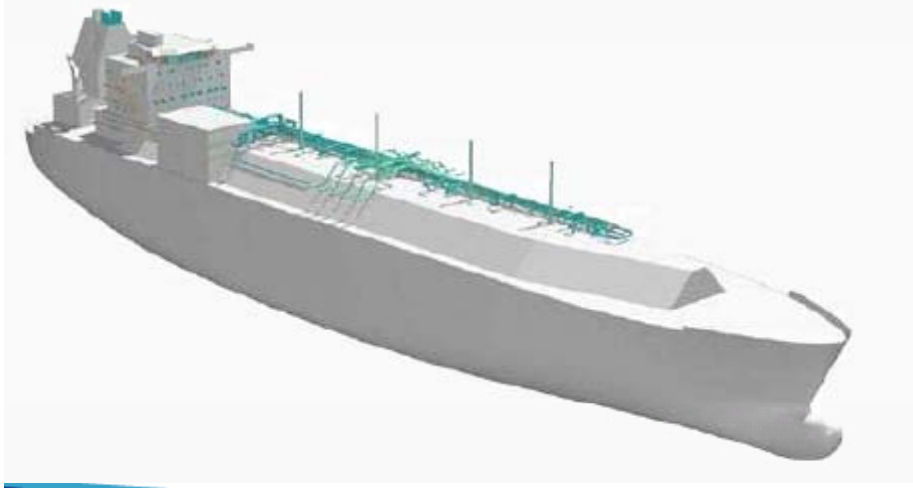
Dalian Shipbuilding Industry Co. Ltd

- **Products**
  - commercial vessels
    - Oil tankers
    - Bulk carriers
    - Container ships
  - Offshore products
    - Jack-up
    - Semi-Submersible
    - FPSO & Offshore Service Vessels
  - Navy Ships



Subjects

1. Ship’s recycling development
2. Work’s Partition of IHM Part I
3. How to complete IHM Part I
4. Influence on Chinese shipbuilding



1. Ship's recycling development

Background of Ship's Recycling

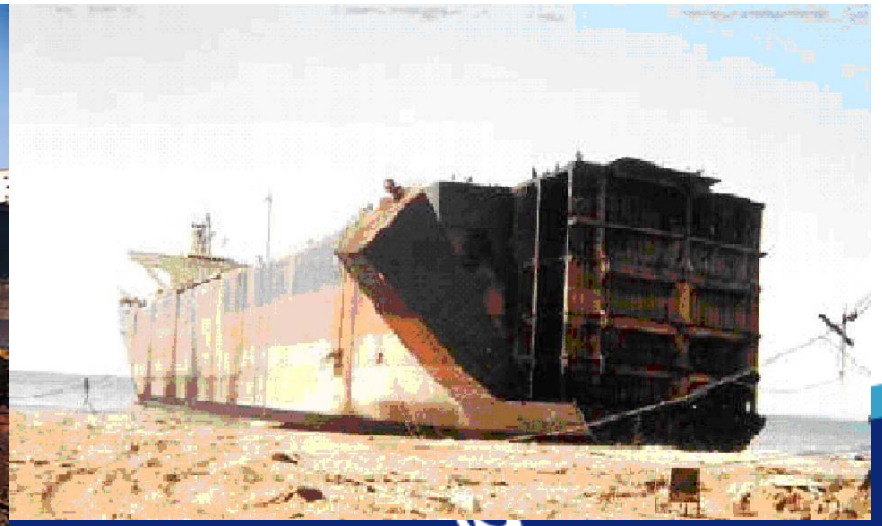
- Ship scrapping industry shifted to Asia in particular to India and Pakistan etc,
- Low cost primitive conditions

- Little regard to health & safety of workers
- Worst safety records
- Massive environmental pollution

1. Ship’s recycling development

Background of Ship’s Recycling

- Awareness in media and the general public
- Increased number of ships to be scrapped
- Take a responsible stand to environmental issues



1. Ship's recycling development

- ✓ IMO guidelines On Ship's Recycling Resolution A962(23) was adopted on 5th Dec. 2003

  Green passport

- ✓ The International Convention for the Environmentally Sound Recycling of Ships was adopted in Hong Kong May 2009

1. Ship's recycling development

- ✓ This Convention shall enter into force 24 months after the date on which the following conditions are met:
  - not less than 15 States have either signed it without reservation as to ratification, acceptance or approval, or have deposited the requisite instrument of ratification, acceptance, approval or accession in accordance with Article 16;
  - the combined merchant fleets of the States mentioned in paragraph 1.1 constitute not less than 40 per cent of the gross tonnage of the world's merchant shipping; and
  - the combined maximum annual ship recycling volume of the States mentioned in paragraph 1.1 during the preceding 10 years constitutes not less than 3 percent of the gross tonnage of the combined merchant shipping of the same States.
- ✓ As part of the requirements for ship yards and owners, the Inventory of Hazardous Materials (IHM) must be developed.

1. Ship's recycling development

- ✓ MEPC179(59) Guidelines for The Developments of The Inventory of hazardous Materials was adopted on 17th July 2009.
- ✓ The Inventory is a report summarizing prohibited and restricted materials used and quantifies and locates hazardous materials onboard the ship.
- ✓ Many states and industry are involved including flag states, ship's recycling states, shipbuilding industry, Ship's repair industry, Shipping industry, ship recycling industry and equipment suppliers.
- ✓ There are over 1000 kinds of maritime products which may present various types of hazardous material that should be calculated/estimated and recorded.
- ✓ It is hoped the convention will enter into force around 2013-2016.

1. Ship's recycling development

Green Passport (IMO Resolution A.962(23))	Resolution MEPC.179(59))
Threshold values were available for PCB. As long as equipment contained <50 mg PCB/kg, the maker could declare 0 haz. materials	Asbestos, PCB, Ozone depleting substances are PROHIBITED!
The manufacturer had to declare all plastics as hazardous materials	Plastic is removed from the Hazardous Materials list unless it contains certain Brominated flame retardants (PBBs)
No surveys is necessary	includes enforcement tools such as surveys, sampling etc
Statement of Compliance was issued directly after review and verification of the Inventory Report	An initial survey is required *before* Statement of Compliance is issued
No requirements for the Recycling Facility	The Recycling Facility (shipyard) must meet strict requirements to ensure that the environment and the health of the workers are maintained

1. Ship's recycling development

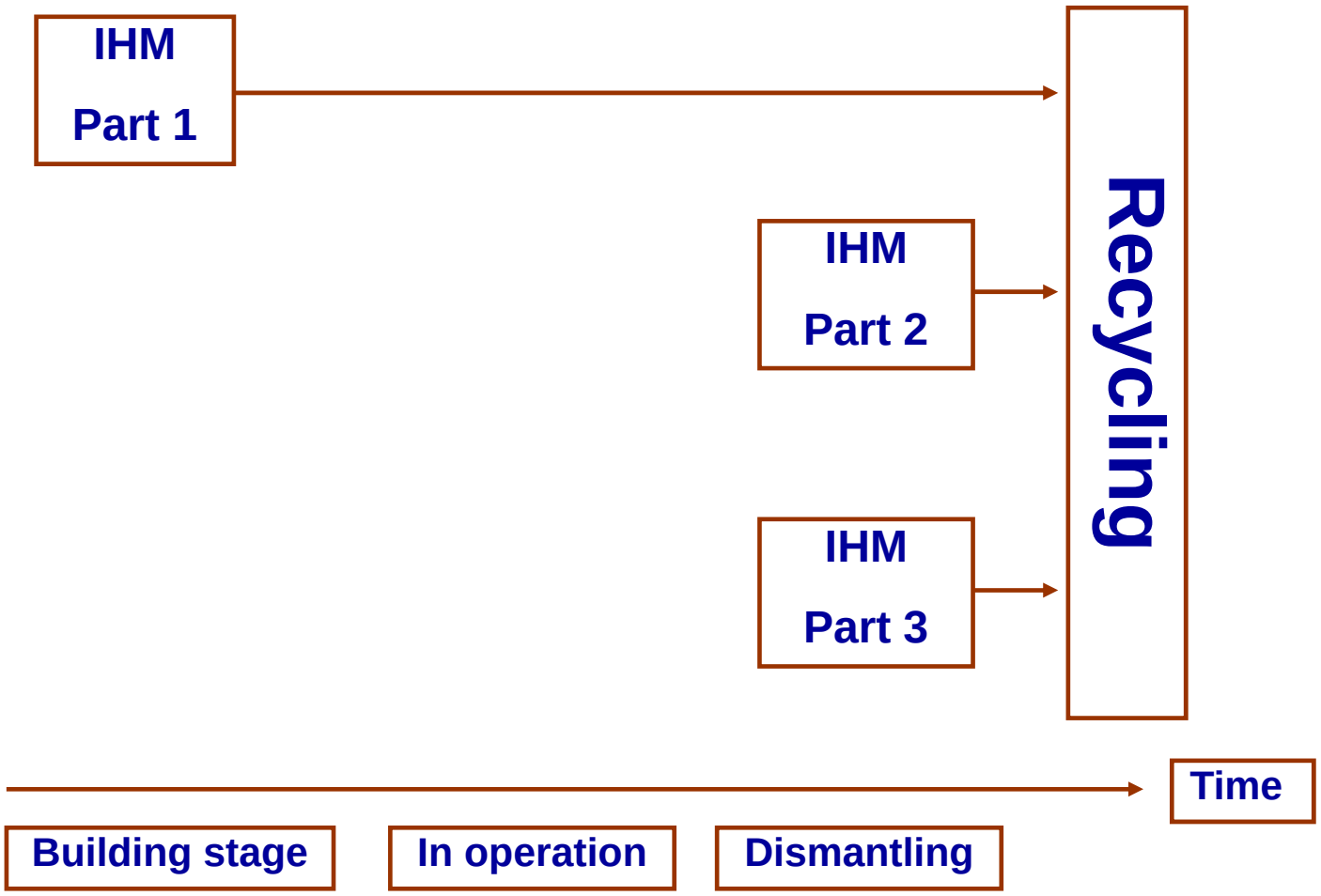
Scope of the Inventory

- Part 1:
  - Identify Hazardous Materials listed in Table A and B contained in ship's structure and equipment, their location and approx. quantities
- Part 2:
  - Operationally generated wastes,

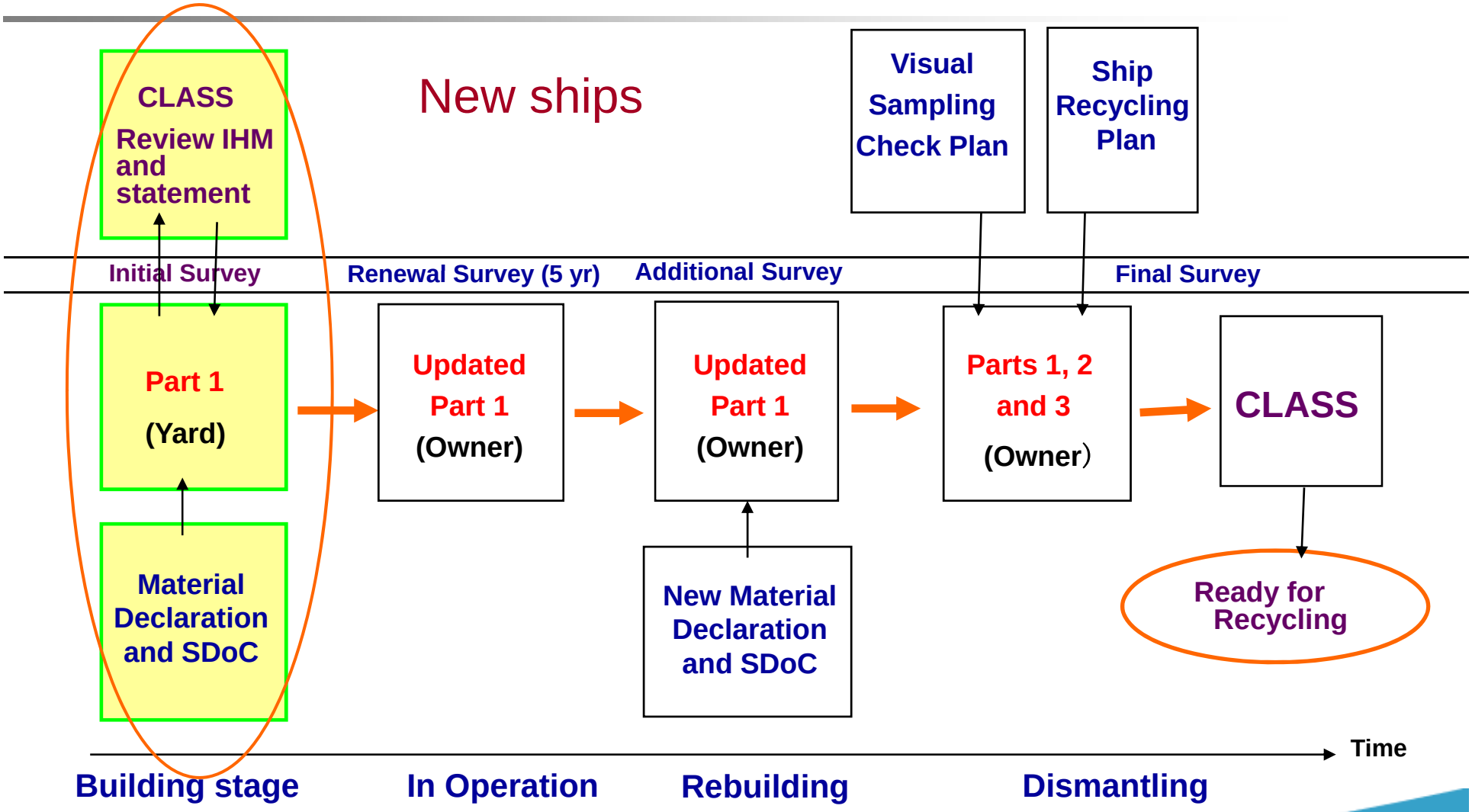
    inluding potential hazardous items which were listed in Table C
- Part 3:
  - Stores

    Including accom. applicances ,regular consumable goods like TV sets, refrigerator, lamps etc.

1. Ship's recycling development



1. Ship's recycling development



2. Work's Partition of IHM Part I

Yard

Submit

Supplier prepare:

1. Supplier Declaration of Conformity (SDoC)
2. Material Declarations (MD)
   - List of hazardous materials in a component or a equipment
   - Quantity
   - Location
3. Supplier may also request from their suppliers if necessary

2. Work's Partition of IHM Part I

Yard prepare:

1. Requests to maker for MD and SDoC when purchasing equipment or system
2. List of MD and SDoC from Suppliers
3. Summary for Inventory of Hazardous Materials Onboard
4. Location Diagram
5. Send IHM + associated document to Class for review (or approval)

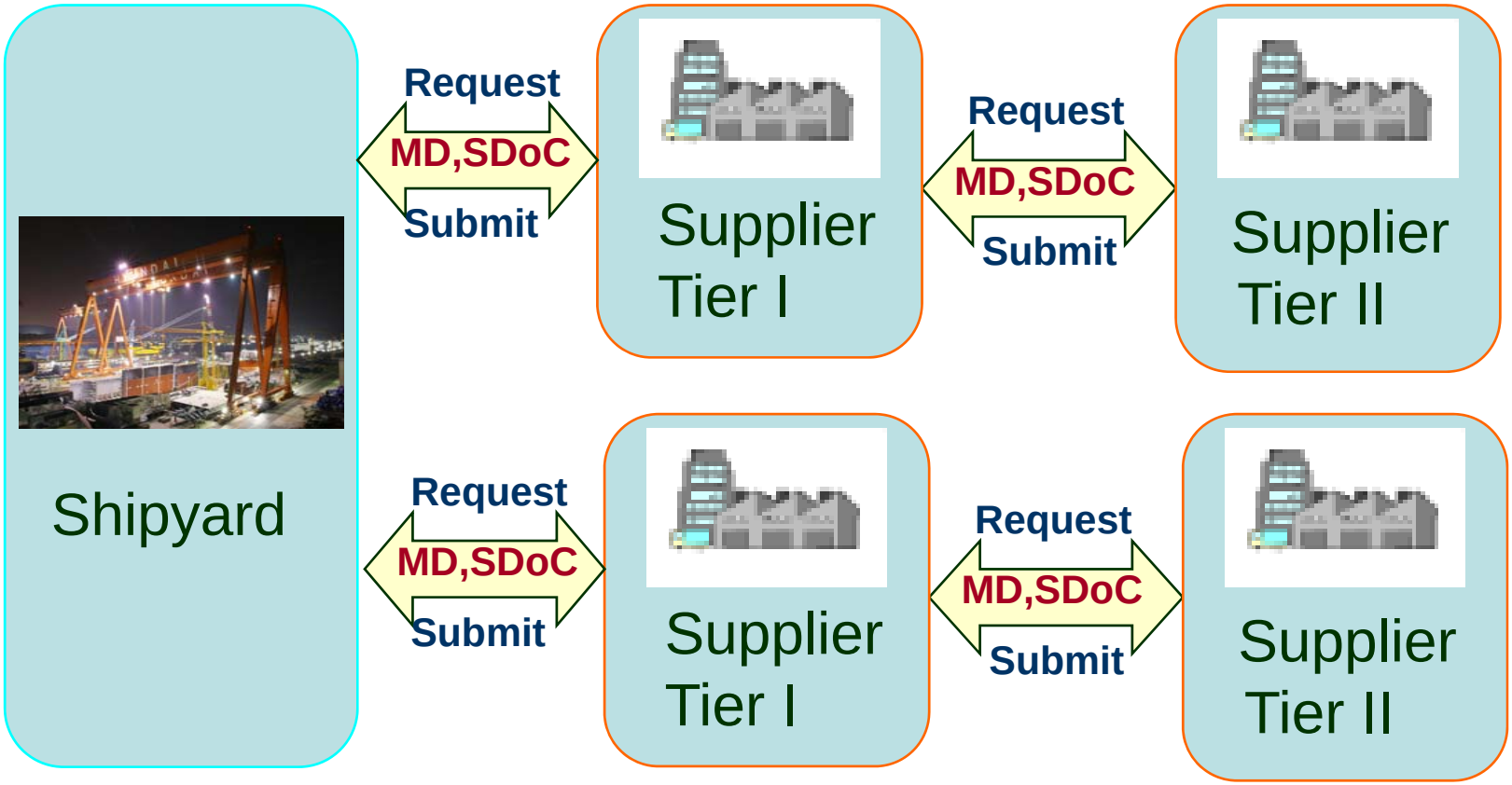
Enclosed

Supplier

MD

SDoC

2. Work's Partition of IHM Part I



2. Work's Partition of IHM Part I

Class will:

- Provide assistance when creating the IHM
- Review or approve the relevant document
- Prepare Technical Report for IHM
- Initial Survey
- Issue CLASS Statement (or certificate) of Compliance at ship's delivery

2. Work's Partition of IHM Part I

- Manufacturer's declaration should be included in the submitted drawing.

YARD

- Requesting
- Data Collection
- IHM (part 1) Preparation

Data request (by POS) →

← Declaration document

Manufacturer

- Material information
- Materials Declaration
- Supplier's Declaration of Conformity

Submission of IHM (part 1) and manufacturer's declaration documents →

← Approval

CLASS

- Review & approval
- Initial survey
- Issue Statement or Cert.

2. Work's Partition of IHM Part I

TABLE A* Materials listed in appendix 1 of the Annex to the convention

NO	Materials		Inventory			Threshold level
			Part I	Part II	Part III	
A-1	Asbestos		x			Prohibited
A-2	**Polychlorinated biphenyls(PCBs)**		x			Prohibited
A-3	**Ozone Depleting Substances**	CFCs	x			Prohibited
		Halons	x			
		Other fully halogenated CFCs	x			
		Carbon tetrachloride	x			
		1,1,1-Trichloroethane (Methyl chloroform)	x			
		Hydrochlora fluorocarbons	x			
		Hydrochlora fluorocarbons	x			
		Methyl bromide	x			
		Bromochloromethane	x			
A-4	**Anti-fouling systems containing organotin compounds as biocide**		x			2500mg total tin/kg

2. Work's Partition of IHM Part I

TABLE B* Materials listed in appendix 2 of the Annex to the convention

NO.	Materials	Inventory			Threshold level
		Part I	Part II	Part III	
B-1	Cadmium and cadmium compounds	X			100 mg/kg
B-2	Hexavalent chromium and hexavalent chromium compounds	X			1000 mg/kg
B-3	Lead and lead compounds	X			1000 mg/kg
B-4	Mercury and mercury compounds	X			1000 mg/kg
B-5	Polybraminated biphenyl(PBBs)	X			1000 mg/kg
B-6	Polybromlnated diphenyl ethers (PBDEs)	X			1000 mg/kg
B-7	Polychlorinated naphthalenes(more than 3chiorine atoms)	X			No threshold level
B-8	Radioactive substances	X			No threshold level
B-9	Certain shortchain chlorinated paraffins(Alkanes,C10-C13,chloro)	X			1 %

2. Work's Partition of IHM Part I

- ✓ Table C Potentially hazardous items shall be listed in Part II or Part III
- ✓ Table D* Regular consumable good potentially containing hazardous materials Shall be listed in Part III
- ✓ Part II or Part III shall be carried out by ship owner before ship's dismantling.

IHM part I for existing ships (shipowner):

- Collection of necessary information
- Assessment of collected information
- Preparation of visual/sampling check plan
- Onboard visual check and sampling check; and
- Preparation of part I of IHM

2. Work's Partition of IHM Part I

Not to be Listed in IHM:

- Materials listed in Table B that are inherent in solid metals or metal alloys such as hull/superstructure steel, pipes or housing for equipment
- Mess gear, dishes, beddings etc.

3. How to complete IHM Part I

A: MD – Prepard by supplier:

- Name of company, contact person and signature
- Date and identification no.
- 1 sheet for 1 ”facility”
- For the Materials which are less than the limit, it is no need to list in IHM, but some class recommend to list in the IHM, then enter “0” on all elements in the form.
- Only hazardous materials in Table A and Table B shall be listed.
- Use ISO standard for quantity (kg, m^3, etc.).
- Quantity and Location information shall be included.
- Paint: can use paint specification (used on hull, deck, tanks and superstructure) as basis.

3. How to complete IHM Part I

MEPC179(59)

Material Declaration

<Date of declaration>

Date	

<Supplier Information>

Company Name	
Division Name	
Address	
Contact Person	
Telephone No.	
Fax No.	
E-mail Address	

<Product Information>

Product Name	Product Number	Product Total Mass		Product Information
		Mass	Unit	

<Material Information>

Table	Material Name		Threshold Level	Intentionally added above threshold level	If yes, Material Mass		If yes, Detailed Material Information
				Yes/No	Mass	Unit	
Table A (Materials Listed in Appendix 1 of the Convention)	Asbestos	Asbestos	no threshold level				
	Polychlorinated Biphenyls (PCBs)	Polychlorinated Biphenyls (PCBs)	50 mg/kg				
	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					
	Organotin compounds	Tributyl Tins	2,500 mg/kg				
		Triphenyl Tins					
		Tributyl Tin Oxide (TBTO)					

Table	Material Name	Threshold Level	Intentionally added above threshold level	If yes, Substance Mass		If yes, Detailed Substance Information
			Yes/No	Mass	Unit	
Table B (Materials Listed in Appendix 2 of the Convention)	Cadmium and Cadmium Compounds	100 mg/kg				
	Hexavalent Chromium and Hexavalent Chromium Compounds	1,000 mg/kg				
	Lead and Lead Compounds	1,000 mg/kg				
	Mercury and Mercury Compounds	1,000 mg/kg				
	Polybrominated Biphenyl (PBBs)	1,000 mg/kg				
	Polybrominated Diphenyl ethers (PBDEs)	1,000 mg/kg				
	Polychloronaphthalenes (CNs)	no threshold level				
	Radioactive Substances	no threshold level				
	Certain Shortchain Chlorinated Paraffins	1%				

EXAMPLE

MATERIAL DECLARATION

Type 1: SELF DECLARATION

<Date of declaration>

Date:	2009-5-23

<IMO ID Numbers> (DNV will assign a unique number to each MD)

MD-ID-No.	

<Other Information (e.g. ship/builder, hull NO if applicable.)>

Remark 1	When new Dive without Cadmium batteries
Remark 2	are launched, updated MD will be submitted.
Remark 3	

Is product already Type approved by DNV? Yes: X No:

<Supplier (Respondent) Information>

Company name	Best Marine Equipment Supplies Co. Ltd
Division name	Propulsion Division
Adress	235 Production street, East Industrial Area, London
Contact person	Peter Andersson
Telephone no	123.456.789.870
Fax no	123.456.789.871
E-mail adress	petersson.p@best-marine-supplies.com
SDoC ID no	1

<Product Information>

Product Name	Product Number	Product Total Mass		Product Information
		Mass	Unit	
Propulsion converter	BD-PC-800A-LW	3450	kg	Lightweight version

This material information shows the amount of hazardous materials contained in: 1 kg

<Material Information>

Table	Material Name		Threshold level	Present above threshold level Yes or No	IF YES Material Mass		IF YES Information on where it is used
					Mass	Unit	
Table A Materials listed in appendix 1 of the Convention	Asbestos	Asbestos	No threshold level	No			
	PCBs	Polychlorinated Biphenyls (PCBs)	No threshold level	No			
	Ozone depleting substances	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 components as a biocide		2,500 mg total tin/kg				

Table	Material Name	Threshold level	Present above threshold level Yes or No	IF YES Material Mass		IF YES Information on where it is used
				Mass	Unit	
Table B Materials listed in appendix 2 of the Convention	Cadmium & Cadmium Compounds	100 mg/kg	Yes	2.5	kg	Backup batteries for control unit
	Hexavalent Chromium and Hexavalent Chromium Compounds	1,000 mg/kg	No			
	Lead and Lead Compounds	1,000 mg/kg	Yes	22	kg	Accumulator battery
	Mercury and Mercury Compounds	1,000 mg/kg	No			
	Polybrominated Biphenyl (PBBs)	1,000 mg/kg	Yes	0.01	kg	Used as flame retardant in plastic cover for control unit
	Polybrominated Diphenyl Ethers (PBDEs)	1,000 mg/kg	No			
	Polychloronaphthalenes (CNs)	No De Minimal	No			
	Radioactive substances	No De Minimal	No			
	Certain Shortchain Chlorinated Paraffins	1%	No			

The object of declaration described above is in conformity with the Guidelines for the development of Inventory of Hazardous Materials Resolution MEPC.179(59) Adopted on 17 July 2009

/ / .....

(Date, Signature and Company Stamp)

IMPORTANT NOTICE: Any significant change in material content may render this declaration invalid.
Validity date relates to the DNV internet publication of declaration.

3. How to complete IHM Part I

B: SDoC - Prepard by supplier

- Identification no.
- Name of company, contact person and address of the issuer
- Date and place of issue
- The subject of the Declaration of Conformity (such as name, type, model no. etc.)
- 1 sheet for one supplier
- Statement of conformity
- Signature (or equivalent sign of validation), name and function of the authorized person(s) acting on behalf of issuer

3. How to complete IHM Part I

MEPC179(59) ANNEX 2

Example Form of Supplier's Declaration of Conformity

Supplier's declaration of conformity for Material Declaration Management

1) No. _____

2) Issuer's name: _____

Issuer's address: _____

3) Object of the declaration: _____

_____

_____

4) The object of the declaration described above is in conformity with the requirement of the following documents :

	Document No.:	Title:	Edition/Date of issue
5)	_____	Guidelines for the development of the Inventory of Hazardous Materials	_____

6) Additional Information : _____

_____

Signed for and on behalf of:

_____

_____

(Place and date of issue)

7) _____ _____

(Name, function) (Signature)

SUPPLIERS DECLARATION OF CONFORMITY for Material Declaration Management

(Please refer to IMO Resolution MEPC.179(59))

EXAMPLE

1) SDoC No: 1

2) Issuers name: Best Marine Equipment Supplies Co. Ltd

Issuers adress: 236 Production street, East Industrial Area, London

3) Object(s) of the declaration:
1) Propulsion converter, Lightweight version
2) Propulsion converter, Standard version
3) Thruster converter, 500-series
4) Thruster converter, 800-series
5)
6)
7)
8)
9)
10)

4) The object of declaration described above is in conformity with the requirement of the following documents:

5) Document No.:	Title:	Edition	Date of issue:
BMEQ QM-P	Best Marine Equipment Quality Management system Part 1: Production	Rev.3.2	2009-2-12
BMEQ QM-SC	Best Marine Equipment Quality Management system Part 2: Sales and contract	Rev.2	2009-2-15

6) Additional Information: Best Marine Equipment Supplies is preparing for ISO 14001 Environmental Management system certification within 2009.

Signed for and on behalf of:

Peter Andersson, Managing Director

London (Place of Issue) 2009-2-15 Date of Issue

7) Chris Brown , QA Manager (Name, function) (Signature)

3. How to complete IHM Part I

C: List of MD and SDoC (Prepared by shipyard):

- Add this list inside the class approval drawing list
- Collect all the MD and SDoC from the suppliers
- Make a onboard system or equipment list and attached MD and SDoC in the list.
- Complete list
- Send to class for review or approval

3. How to complete IHM Part I

Example

PLAN HISTORY

DATE	REV.	PAGE	DESCRIPTION	DWN.	CHKD.	MGR.
2010.02.26	0		PREPARED FOR GREEN PASSPORT			

REVIEWED

(541)SHEETS WITH A COVER

HULL NO. [redacted]

TYPE [redacted]

TITLE [redacted]

SUPPLIER'S DECLARATION LIST OF CONFORMITY
FOR MATERIAL DECLARATION MANAGEMENT

DEPT	SCALE	DATE	DWG NO.	REV. NO.
[redacted]	NONE	2010-02-26		0

[redacted] Co.,Ltd.

F-N-1D2016-DECLARATION LIST1

3. How to complete IHM Part I

SUPPLIER'S DECLARATION LIST OF CONFORMITY
FOR MATERIAL DECLARATION MANAGEMENT

PAGE 2 / 3
MODEL NO. [redacted]
Hull No. [redacted]

INDEX

Example

SUPPLIER'S DECLARATION LIST OF CONFORMITY
FOR MATERIAL DECLARATION MANAGEMENT

PAGE 3 / 3
MODEL [redacted]
Hull No. [redacted]

3. How to complete IHM Part I

D: Executive Summary (Prepared by shipyard):

- Add this list inside the class approval drawing list
- Collect all the data from MDs which provided by suppliers
- Make a summary for all the hazardous material.
- Send to class for review or approval

3. How to complete IHM Part I

STANDARD FORMAT OF THE INVENTORY OF HAZARDOUS MATERIALS

Part I HAZARDOUS MATERIALS CONTAINED IN THE SHIP'S STRUCTURE AND EQUIPMENT

I-1 Paints and coating systems containing materials listed in Table A and Table B of appendix 1 of the Guidelines

No.	Application of paint	Name of paint	Location	Materials (classification in appendix 1)	Approx. quantity		Remarks
1	Anti-drumming compound	Primer, xx Co., xx primer #300	Hull part	Lead	35.00	kg	
2	Anti-fouling	xx Co., xx coat #100	Underwater parts	TBT	120.00	kg	

I-2 Equipment and machinery containing materials listed in Table A and Table B of appendix 1 of the Guidelines

No.	Name of equipment and machinery	Location	Materials (classification in appendix 1)	Parts where used	Approx. quantity		Remarks
1	Switch board	Engine control room	Cadmium	Housing coating	0.02	kg	
			Mercury	Heat gauge	<0.01	kg	less than 0.01kg
2	~~Diesel engine, xx Co., xx #150~~	~~Engine room~~	~~Cadmium~~	~~Bearing~~	~~0.02~~	~~kg~~	
3	Diesel engine, xx Co., xx #200	Engine-room	Cadmium	Bearing	0.01	kg	Revised by XXX on Oct. XX, 2008
4	Diesel generator (x 3)	Engine-room	Lead	Ingredient of copper compounds	0.01	kg	

I-3 Structure and hull containing materials listed in Table A and Table B of appendix 1 of the Guidelines

No.	Name of structural element	Location	Materials (classification in appendix 1)	Parts where used	Approx. quantity		Remarks
1	Wall panel	Accommodation	Asbestos	Insulation	2,500.00	kg	
2	Wall insulation	Engine control room	Lead	perforated plate	0.01	kg	cover for insulation material
			Asbestos	Insulation	25.00	kg	under perforated plates
3							

3. How to complete IHM Part I

Inventory of Hazardous Materials

Part 1 HAZARDOUS MATERIALS CONTAINED IN THE SHIP'S STRUCTURE AND EQUIPMENT

1.1 Paints and Coating systems containing materials listed in table A and table B of appendix 1 of the Guidelines

No.	Application of Paint	Name of paint	Location*	Material (Classification in appendix 1)	Approx quantity		Remarks
						Unit:	
1							
2							
3							
4							
5							

1.2 Equipment and Machinery containing materials listed in table A and table B of appendix 1 of the Guidelines

No.	Name of quipment and Machinery	Location*	Material (Classification in appendix 1)	Parts where used	Approx quantity		Remarks
						Unit	
1							
2							
3							
4							
5							

1.3 Structure and Hull containing materials listed in table A and table B of appendix 1 of the Guidelines

No.	Name of quipment and Machinery	Location*	Material (Classification in appendix 1)	Parts where used	Approx quantity		Remarks
						Unit:	
1							
2							
3							
4							
5							

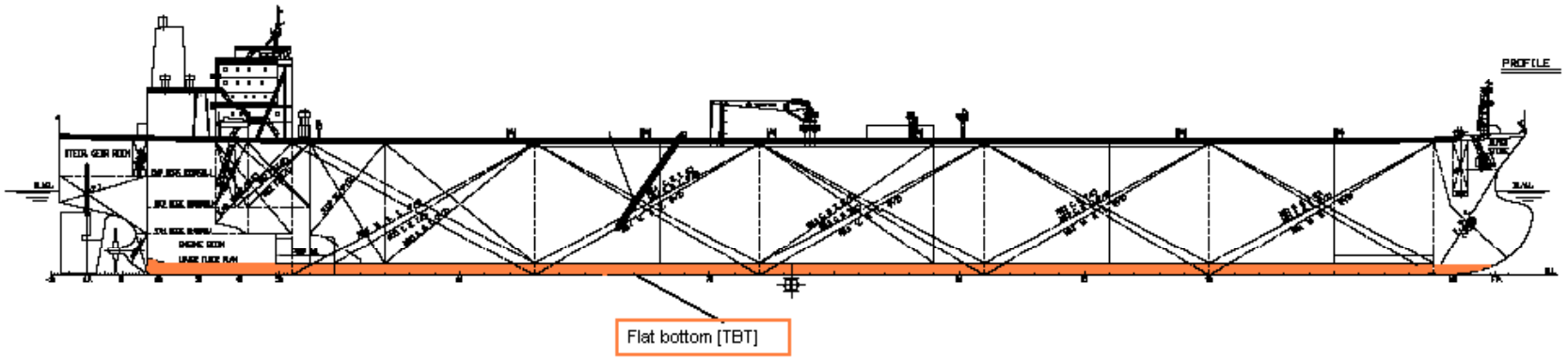
ch item should be entered in order based on its location, from a lower level to an upper level and from a fore part to an aft

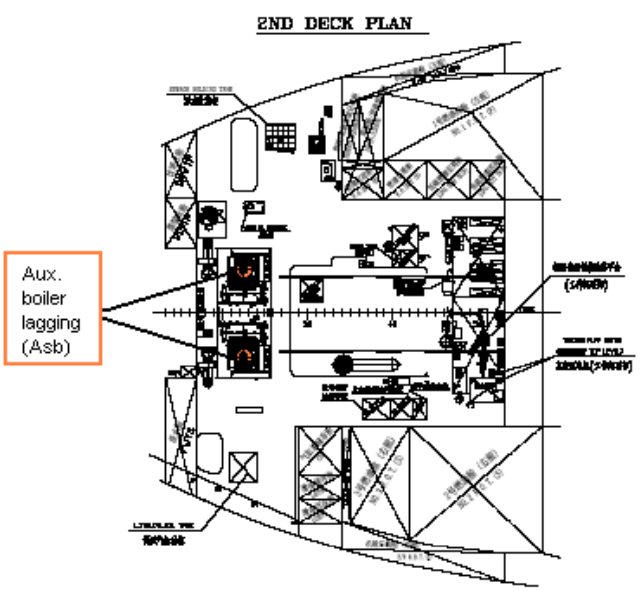
3. How to complete IHM Part I

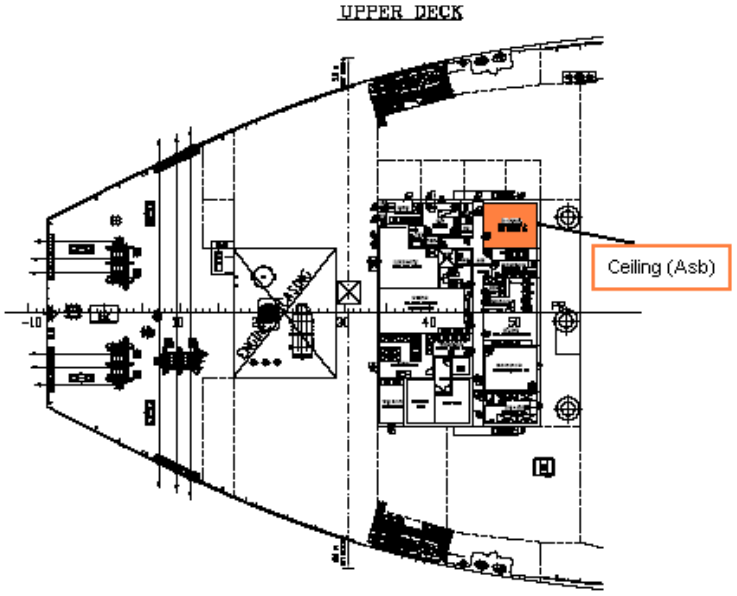
E: Location Diagram (Prepared by shipyard):

- Possible drawings can be used:
  - General arrangement drawings
  - Fire Control and Safety Plan
  - E/R Arrangement Plan
  - P/R Arrangement Plan
  - Arrangement of Accommodation
- Add this list inside the class approval drawing list
- Mark the location of hazardous material in the selected drawing based on the summary.
- Complete and send to class for review or approval

3. How to complete IHM Part I







4. Influence on Chinese Shipbuilding

Supplier situlation in China:

Small or middle company

Pay more attention on the function, not on reducing the usage of hazardous material.

Influence On Suppliers:

① Suppliers need to ensure that the equipment or systems which they produce do not contain the hazardous materials listed in table A. If the present equipment contains these prohibited materials, they shall develop new material to replace it.

② Suppliers need to investigate new technology to fulfill the updated restricted requirement by IMO.

③ Cost increase because of the prohibited and restricted threshold level.

4. Influence on Chinese Shipbuilding

Influence On Shipyards:

① Shipyards need to collect MD, SDoC from suppliers; make the summary of the IHM, and send them to class for review or approval.

② Check the MD and SDoc which submitted by suppliers, ensure the equipment on board fulfills the resolution requirement. If the equipment contains the prohibited materials, the equipment can not be used onboard ship.

③ Tracking the development of the ship's recycling resolution, and updating their designs.

④ Selected green materials to compete in the shipbuilding market

4. Influence on Chinese Shipbuilding

Influence on Recycling Industry:

① New guidelines are under development for authorization of Ship Recycling Facilities, ship recycling plan etc. from this year until Oct. 2012.

Ship's recycling Industry will become safer and more environmentally protecting through these guidelines.

② Many small yards may be eliminated from this industry due to the restricted authorization of Ship Recycling Facilities.

③ This industry may develop and have better benefits in the future.

gyh1

gyh1 Thank you for your attention and quesitons?
guan_yinghua, 2010/11/11