

Ship Recycling Convention

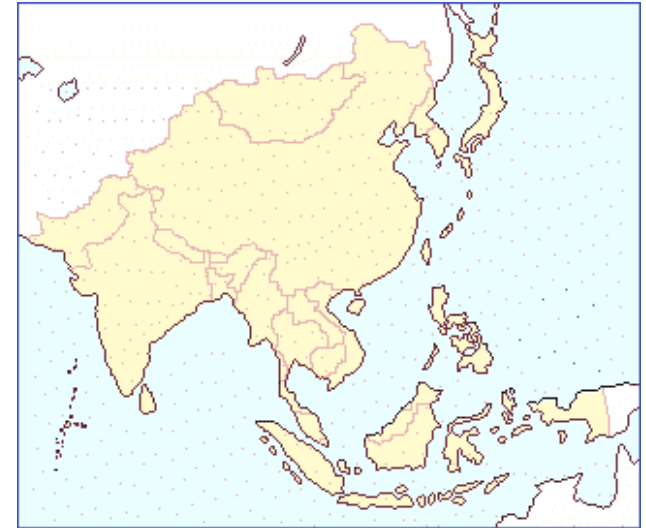
- What does it require shipbuilders to do? -

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Research Association*



- Background
- IMO Ship Recycling Convention
- How To Develop Inventory
 - New Ships
 - Existing Ships
- Conclusion



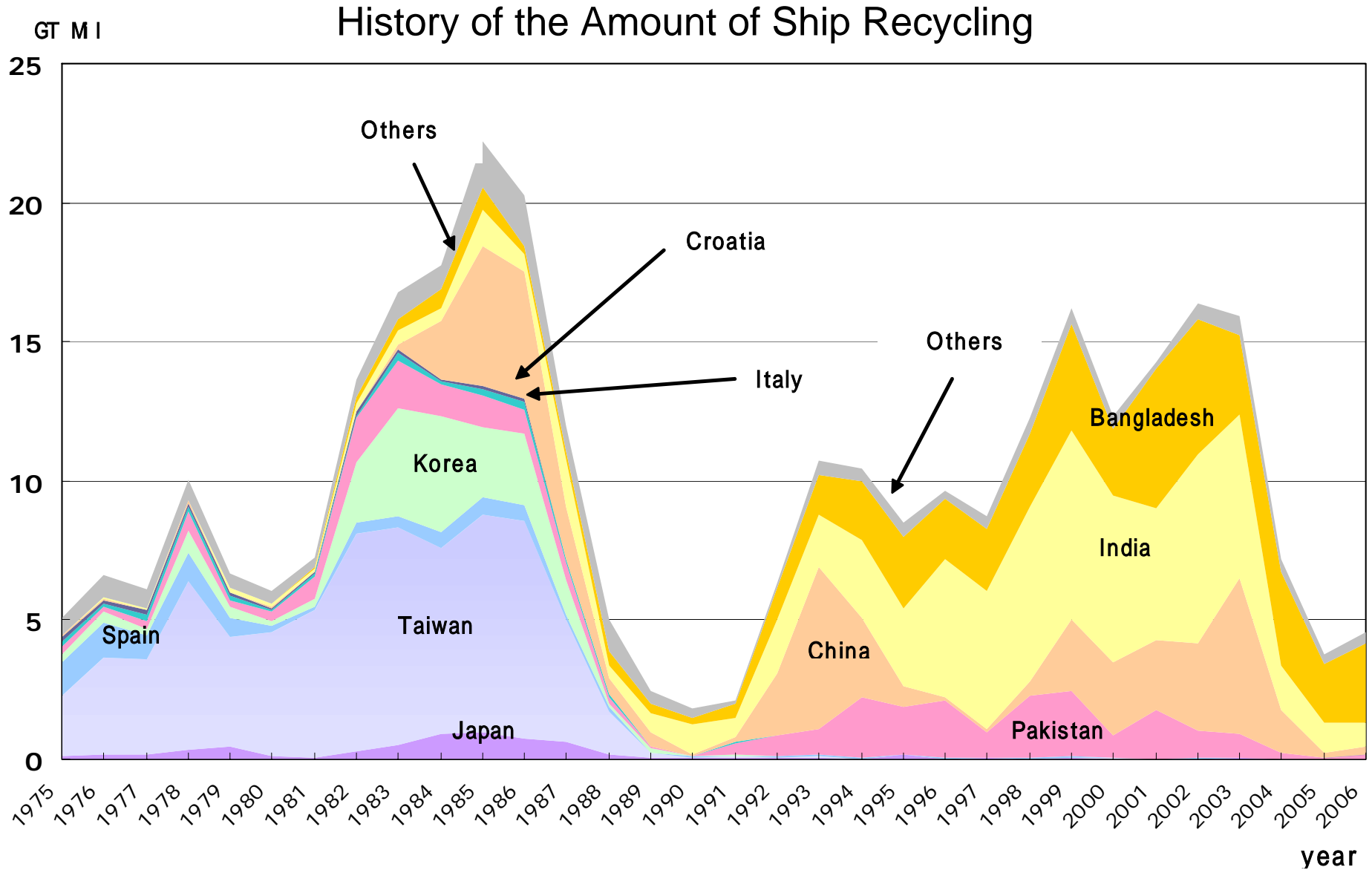
- **Ship Recycling** is.....
valuable source of materials such as steel, equipment and wood
- **Issues** associated with ship recycling include.....
 - **Basel Convention** on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
 - **Marine Pollution** by oil spill
 - **Occupational health and safety** in recycling facilities



International Approach is needed



Background





Background

IMO, UNEP, ILO developed the Guidelines each other

UNEP : Status as the environmentally sound management of Recycling facilities

- Technical guidelines for the environmentally sound management of the full and partial dismantling of ships (Adoption date : Dec.2002)

ILO : Status as safety and health of labor

- Guidelines on safety and health in shipbreaking (Adoption date : Oct. 2003)

IMO : Status as both of them (refer to Next Slide)

- IMO GUIDELINES ON SHIP RECYCLING (A.962) (Adoption date: Dec.2003)
(Non-mandatory guidelines)



The IMO New Convention on Ship Recycling covers all stages (from Construction to Recycling of Ship).



IMO Ship Recycling Convention

➤ Application

- International ships of 500 GT and above
- Recycling facilities

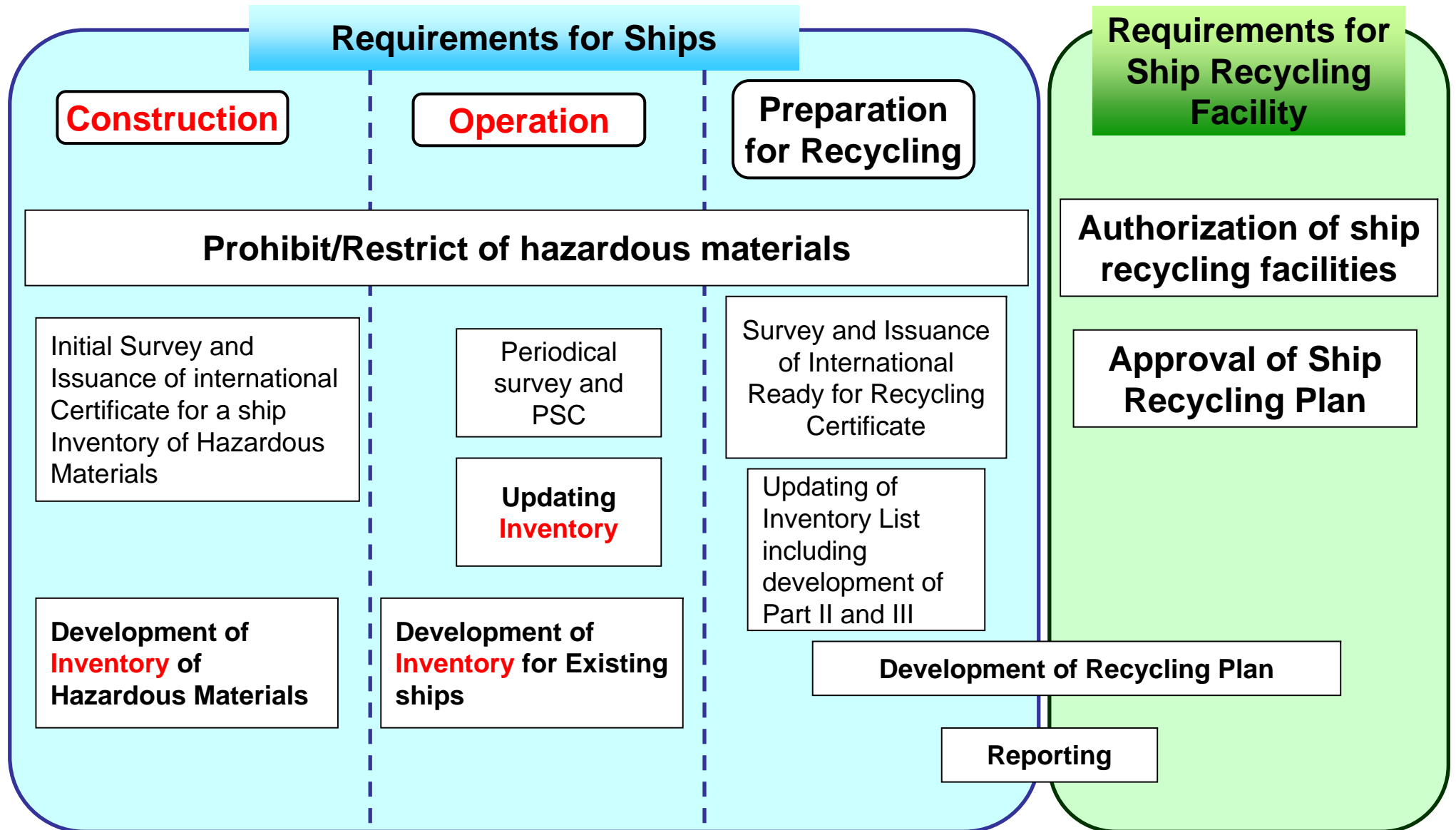


➤ Regulations

- Survey and certification of ships
 - ✓ Prohibition/restriction of the installation/use of hazardous materials
 - ✓ Inventory of Hazardous Materials onboard
 - ✓ Preparation before recycling
- Authorization of ship recycling facilities
 - ✓ Occupational health and safety
 - ✓ Proper treatment/disposal of hazardous materials



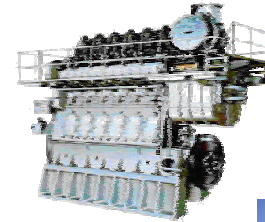
Requirements of Ship Recycling Convention



Responsibilities of Industry Partners

➤ Parts Manufacturers

- Development / Provision of *Material Declaration*



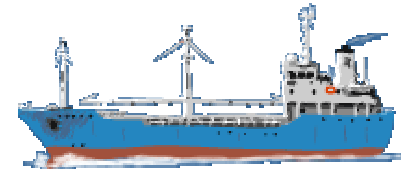
➤ Shipbuilders

- Development of *Inventory of Hazardous Materials* based on Material Declaration



➤ Ship-owners

- *Updating Inventory* of Hazardous Materials
- Development of *Ship Recycling Plan* in cooperation with ship recycling facility



➤ Recycling Facilities

- *Necessity of being authorized* by the Administration
- Preparation of *Ship Recycling Facility Management Plan*
- Development of *Ship Recycling Plan* for each ship





Inventory of Hazardous Materials (Reg.5)

- Development of Part I of Inventory
- Verification by the Administration or RO.
- Maintenance and update of Part I
- Incorporation Part II and Part III prior to recycling

Part I	Materials contained in structure and equipment of the ship	At Initial Survey
Part II	Operationally generated wastes	At Final Survey
Part III	Stores	At Final Survey



Which materials must you identify in Part I ?

NEW SHIPS

- The Inventory shall identify as Part I, hazardous materials listed in Appendix 1 (is same as Table A materials in GL) and Appendix 2 (is same as Table B materials in GL).

EXISTING SHIPS

- The Inventory shall identify as Part I, at least, hazardous materials listed in Appendix 1 (is same as Table A materials in GL)



Inventory Guideline Materials to be listed

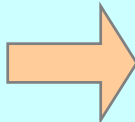
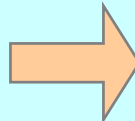
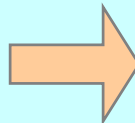
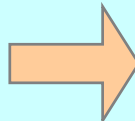
Table A (=Apex. 1)	Prohibited and/or Restricted Hazardous Materials		Part I
Table B (=Apex. 2)	Chemical substances to be listed in the Inventory		Part I (For new ships and new installations)
Table C	Potentially Hazardous Goods		Part II and III
Table D	Regular Consumable Goods		Part II and III



Table A (Prohibited/Restricted Hazardous Materials)

The materials listed in Appendix 1 of the Convention

No.	Hazardous Materials	Referred Legislation
A-1	Asbestos	SOLAS
A-2	Ozone Depleting Substances	MARPOL, Montreal Protocol
A-3	Polychlorinated Biphenyls (PCBs)	Stockholm Convention
A-4	Tributyl Tins, Triphenyl Tins	AFS Convention
	Tributyl Tin Oxide (TBTO)	



Table B (Chemical substances to be listed in the Inventory)

The materials listed in Appendix 2 of the Convention

No.	Materials
B-1	Cadmium and Cadmium Compounds
B-2	Hexavalent Chromium Compounds
B-3	Lead and Lead Compounds
B-4	Mercury and Mercury Compounds
B-5	Polybrominated Biphenyl (PBBs)

No.	Materials
B-6	Polybrominated Diphenyl ethers (PBDEs)
B-7	Polychlorinated Naphthalenes (Cl=>3)
B-8	Radioactive Substances
B-9	Certain Shortchain Chlorinated Paraffins



Standard format of the Inventory

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	Materials (Classification in Appendix 1)	Appx. Quantity	Remarks
1	Anti-drumming compound	Primer, x xCo., xxprimer #300	Hull part	Lead	35.00 kg	
2	Antifouling	xx Co., xx coat #100	Underwater parts	TBT	120.00 kg	

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

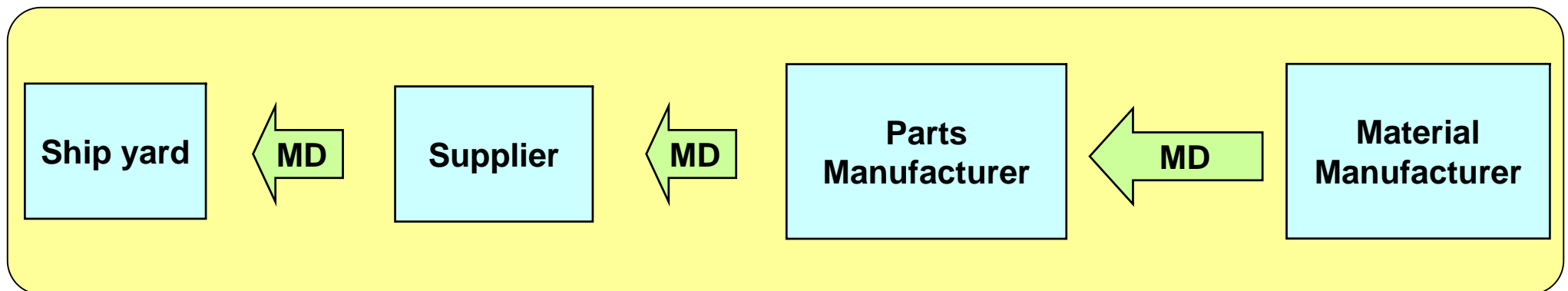
No.	Name of Equipment and Machinery	Location	Materials (Classification in Appendix 1)	Parts of Use	Appx. Quantity	Remarks
1	Switch Board	Engine Control Room	Cadmium	Housing coating	0.02 kg	
			Mercury	Heat gauge	<0.01 kg	less than 0.01kg
2	Diesel Engine, xx Co., xx #150	Engine room	Cadmium	Bearing	0.02 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	

The Inventory should be developed by using the standard format.



How to develop Inventory Part I for New Ships

- Inventory part I should be developed at design and construction stage.
- Suppliers on ship building supply chain should be identified and declare that their supplied products (e.g., machinery, equipment, materials and paints) contain substances listed in Table A and Table B.
- Developer of Inventory Part I should check the substances listed in table A and B based on “**Material Declaration**” (MD).





Declaration of specific chemical substances information

Material Declaration

Following data are required

1. Date of declaration
2. Suppliers name
3. Product name
4. Product number
5. Product total mass
6. Declaration of presence of the materials
7. Mass of the materials

Example Form of 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 Substance	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	
	Cadmium and Cadmium Compounds		100 mg/kg				
	Hexavalent Chromium and Hexavalent Chromium		1,000 mg/kg				



Trial of development of Inventory for New Ships

- Japan Ship Technology Research Association has conducted the following trial project.
- Purpose: Confirmation of the appropriateness of the draft GL.
- Procedure : The draft GL for Development of the Inventory. (MEPC56/3/2) .
- Trial Period: Oct 2007 – Feb 2008
- Trial Ships: Oil Tanker, Bulk Carrier, Ro/ro Carrier
- Participants: 3 major shipbuilders and many suppliers (over 500 companies)



Sample of Inventory for new ship (1)

Inventory of Hazardous Materials (New ship)

Particulars of the "N2 Ship"

Type of Vessel	Roll On/Off Type Vehicle Carrier
Gross Tonnage	abt 60,200
Date of Delivery	March 2008

This Inventory was prepared in accordance with the Inventory Guidelines (the draft Guidelines for the Development of the Inventory of Hazardous Materials (MEPC56/3/2)). This Inventory shows interim results of the trial on the development of the Inventory, subject to the completion of the trial and further check of its contents.



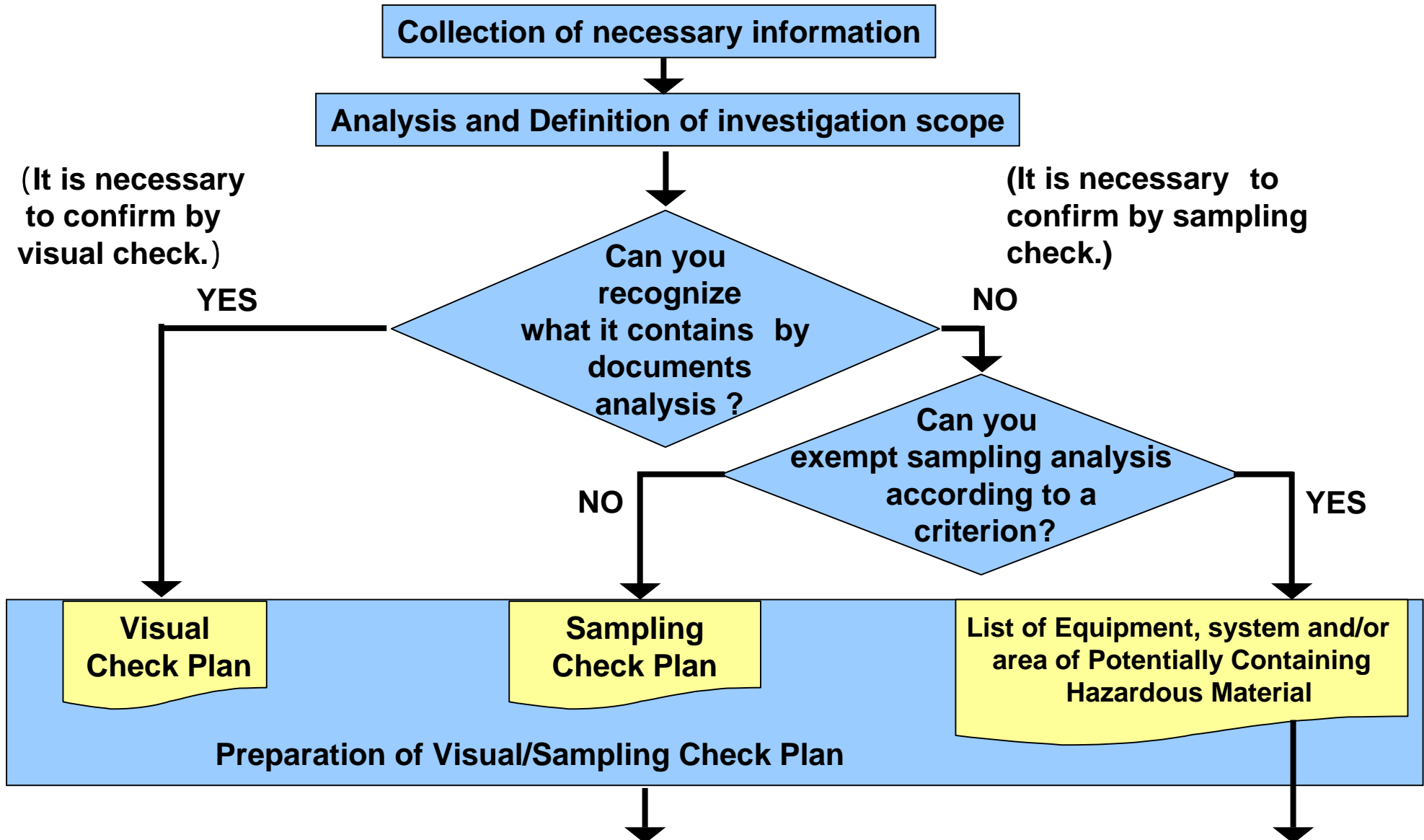
Sample of Inventory for new ship (2)

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

No.	Name of Equipment and Machinery	Location	Materials (Classification in Appendix 1)	Parts of Use	Appx. Quantity	Remarks
1	Pressure Switch	Engine room	Cadmium and Cadmium Compounds	Electric contact	0.00	kg
			Hexavalent Chromium and Hexavalent Chromium Compounds	Plating of body	0.00	kg
			Lead and Lead Compounds	coupling, solder	0.00	kg
2	Chart Weight	Wheelhouse	Lead and Lead Compounds	Weight	13.20	kg
3	FC Valve and FCD Valve	Engine room	Lead and Lead Compounds	Body, Seat, Stem	47.00	kg
4	Aux. Diesel Engine	Engine room	Lead and Lead Compounds	LO cooler, Impeller of pump	1.50	kg
		Engine room	Mercury and Mercury Compounds	Thermometer	0.02	kg
5	Bilge Separator	Engine room	Cadmium and Cadmium Compounds	Pressure Gauge	0.00	kg
			Lead and Lead Compounds	Paint, Solder	0.00	kg
6	Horse Power Meter	Engine room	Cadmium and Cadmium Compounds	Housing	0.00	kg
			Lead and Lead Compounds	Solder	0.09	kg
7	Independent Tank	Engine room	Cadmium and Cadmium Compounds	Filter	0.00	kg
8	Funnel	Engine room	Cadmium and Cadmium Compounds	Trap, stage, Pipe	0.00	kg
9	Dipped Galvanized Bolt & Nut	Engine room	Cadmium and Cadmium Compounds	Zn plating	0.00	kg
			Lead and Lead Compounds	Zn plating	0.00	kg
10	U Bolts & Nuts for Pipe support	Whole pipe line onboard	Cadmium and Cadmium Compounds	Zn plating	0.00	kg
11	Anemometer	Compass Deck	Hexavalent Chromium and Hexavalent Chromium Compounds	Chromate plating	0.00	kg
		Wheelhouse	Lead and Lead Compounds	Solder in Indicator	0.10	kg
12	Emergency Air Compressor	Steering gear room	Cadmium and Cadmium Compounds	Zn plating	0.00	kg
			Hexavalent Chromium and Hexavalent Chromium Compounds	Plating of body	0.01	kg
			Lead and Lead Compounds	Bearing metal, Zn plating	0.02	kg
13	H.F.O. TRANS.PUMP	Engine room	Lead and Lead Compounds	Bearing Metal	0.97	kg
14	Pressure Transmitter	Engine room	Lead and Lead Compounds	Support, Coupling, Joint	0.00	kg
15	Burning Unit in Incinerator	Engine room	Cadmium and Cadmium Compounds	Electric contact	0.00	kg
16	Galvanized steel plate	Engine room	Lead and Lead Compounds	Cover for	200.00	kg

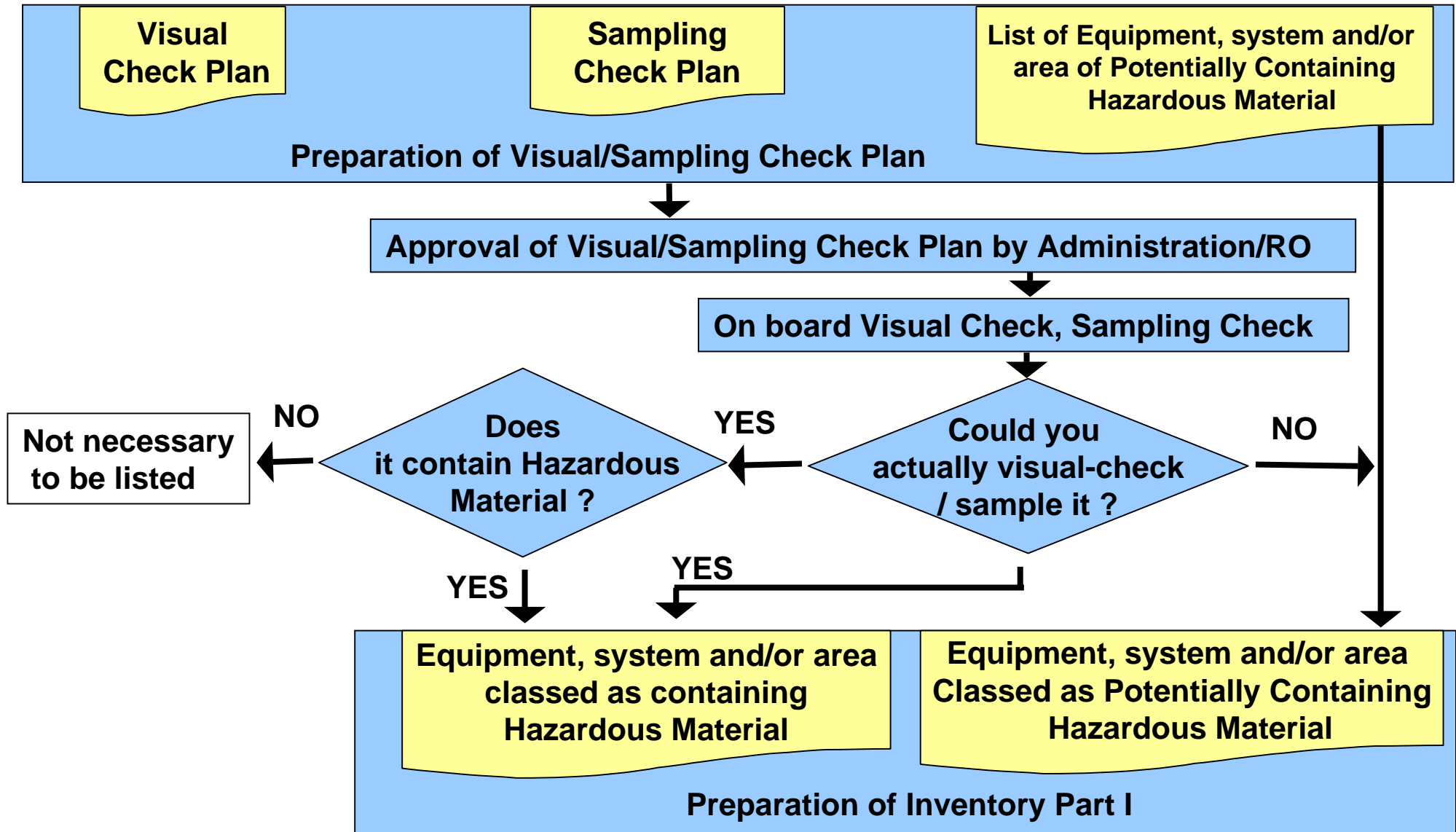


How to develop Inventory Part I for Existing Ships (1)





How to develop Inventory Part I for Existing Ships (2)





Trial of development of Inventory for Existing Ships

- Japan Ship Technology Research Association has conducted the following trial project.
- Purpose: Confirmation of the appropriateness of the draft GL.
- Procedure: the draft GL (MEPC56/3/2) .
- Trial period: April 2007 – June 2008
- Trial Ships: Oil Tanker, Bulk Carrier, LPG Carrier, LNG Carrier, PCC, Passenger Ferry, Government own ship.



Sample of Inventory for existing ship (1)

Inventory of Hazardous Materials (Existing ship)

Particulars of the M.V. "A Ship"

Type of Vessel	LPG Carrier (Low Tem. Type)
Gross Tonnage	ab. 42,00GT
Date of Delivery	MM.DD.1983

This Inventory was developed in accordance with the Draft Guidelines for the Development of the Inventory of Hazardous Materials (MEPC56/3/2).



Sample of Inventory for existing ship (2)

Inventory of Hazardous Materials : MV "A Ship "

Part I 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 I of the Guidelines

No.	Location	Name of Paint	Materials (Classification in Appendix 1)	Appx. Quantity		Remarks
1	Flat bottom	NKM Coatings Coated TBT based LLL 2 GOU in May 1991, then coated sealer coat, Sea Clean 16AP, on June 1995.	TBT	100	kg	Estimated weight of remaining TBT based paints before sealer coating on June 1995. Coated Tin free paints in docking at SSK on April, 2007
2						

1.2 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 of Use	Appx. Quantity	Remarks
1	Mooring winch & Windlass	Upper deck & Lowered Upp.deck	Asbestos	Brake lining Gasket/packing	36.0 kg 1.4 kg	
2	Air winch	Upper deck	Asbestos	Brake lining	3.0 kg	
3	Boat davit winch		Asbestos	Brake lining & brake shoe	0.8 kg	
4	Air conditioning refrigerated machine	Lowered Upp. deck	Asbestos	Compressor	0.1 kg	
5	Provision refrigerated machine		Asbestos	Compressor	0.1 kg	
6	Main engine	Double bottom	Asbestos	Exh.pipe FW cylinder cock Charging air cooler casing gasket Woodward governor gasket NA48 type turbocharger oval gasket Super spool valve gasket Lagging	4.7 kg 0.1 kg 11.9 kg 0.5 kg 7.4 kg 0.2 kg 500.0 kg	Potentially Containing Hazardous Material(PCHM)
7	Reduction gear		Asbestos	Clutch	1.4 kg	
8	CPP valve		Asbestos	Cylinder valve	1.2 kg	
9	Auxiliary turbine		Asbestos	Control valve Sight glass LO regulator Turning gear Lagging	0.3 kg 0.1 kg 0.1 kg 0.1 kg 200.0 kg	PCHM
10	FO adjective injection pump		Asbestos		0.3 kg	
11	Heavy FO transfer pump		Asbestos		less than 50 g	



Sample of Check List for development of Inventory for existing ship

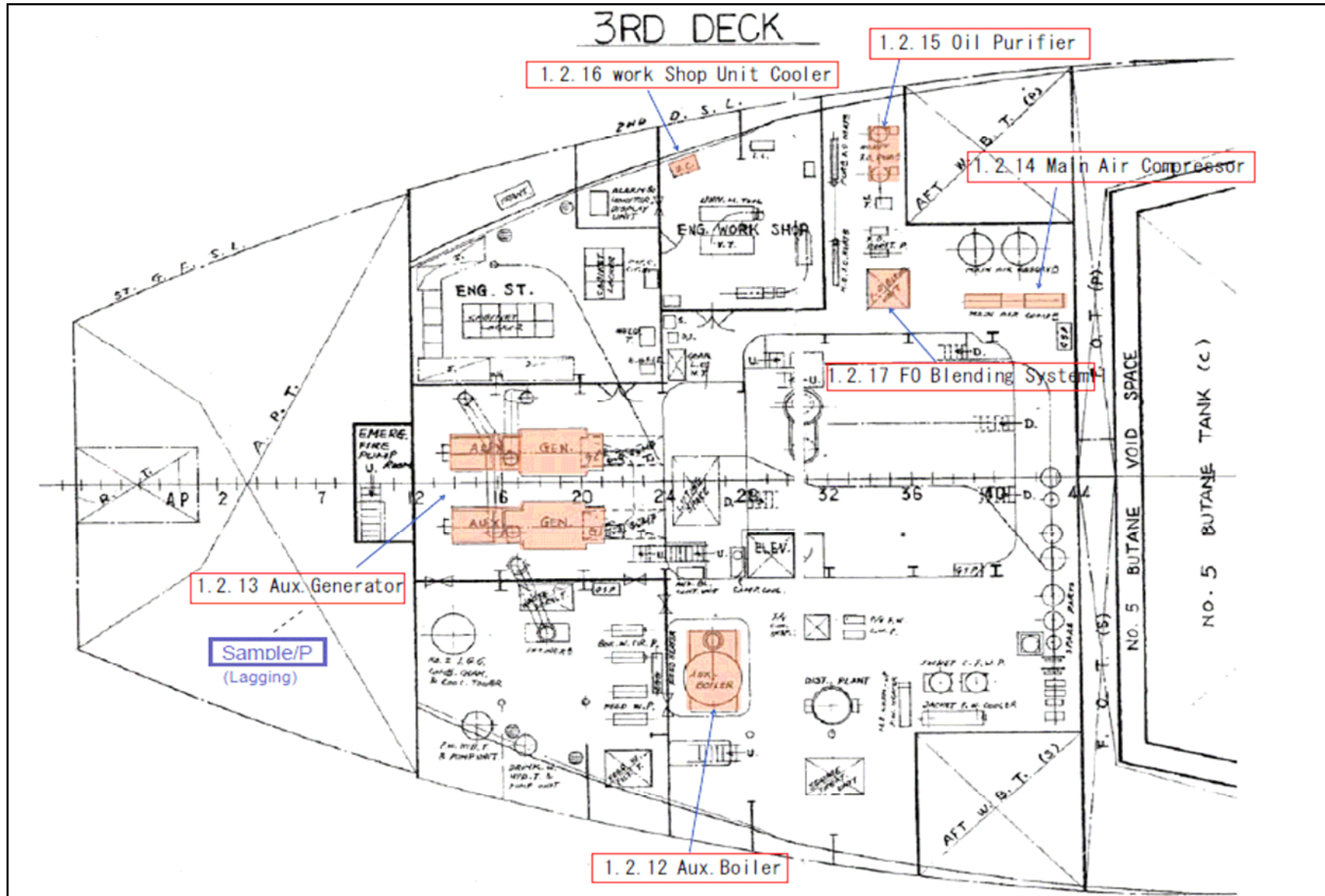
(Attachment 4)

The Check List: Analysis and Definition of the Scope of the Investigations for MV "A Ship"

No.	TBL A/B	Hazardous Materials #1	Location	Name of Equipment	Component	Quantity(kg)			Manufacturer/Brand name	Result of Document Check #2	Check of Procedure #3	Check Result #2	Reference Number of Document			
						Unit	No.	Total								
[Inventory Part I-1.1]																
1	A	TBT	Top side	Painting & Coating	---				NKM Coatings -Jotamastic 87 Red -Jotamastic 87 Grey -Jotamastic TC Grey 10GY	N	V	N	H14, H39 & Application History of A/F paints			
2	A	TBT	Boat top						NKM Coatings -Jotamastic 87 Grey -QD A/C HB Silver -Takata Quantum Plus LB	N	V	N				
3	A	TBT	Vertical Bottom						NKM Coatings Coated TBT based LLL 2 GOU, but full sand-blasting to VB on June 1995.	N	V	N				
4	A	TBT	Flat Bottom		0.02 (kg/m ³)	5000 (m ³)	100.0		NKM Coatings Coated TBT based LLL 2 GOU in May 1991, then coated sealer coat, Sea Clean 16AP, on June 1995.	Y	V	Y				
[Inventory Part I-1.2]																
1	A	Asbestos	Upp.Deck & Lowered Upp. Deck	Windlass&Mooring winch	Brake lining			36.0		Y	V	Y	H-221			
2	A	Asbestos			Gasket/packing			1.4		Y	V	Y				
3	A	Asbestos	Upper deck	Air winch	Brake lining			3.0	Ueda iron Works Co.	Y	V	Y	H-221			
4	A	Asbestos		Boat davit winch	Brake lining & brake shoe			0.8	Sekigahara Seisakusho Ltd.	Y	V	Y				
5	A	Asbestos	Lowered Upp. Deck	Air conditioning refrigerated machine	Compressor			0.1	Taisho Kinzoku Kogyosho	Y	V	Y	H-221			
6	A	Asbestos		Provision refrigerated machine	Compressor			0.1	Taisho Kinzoku Kogyosho	Y	V	Y				
7	A	Asbestos	Double bottom	Main engine MAN 14V52/55A	Exhaust pipe packing			4.7	brand unknow	Y	V	Y	M-181			
8	A	Asbestos			Fresh water cylinder outlet	cock gasket			0.1	Nippon Pillar/P5000	Y	V		Y		
9	A	Asbestos			Charging air cooler casing	gasket			11.9	Valqua/V224	Y	V		Y		
10	A	Asbestos			Woodward governer gasket				0.5	brand unknow	Y	V		Y		
11	A	Asbestos			NA48 type turbocharger oval				7.4	Valqua/V1500	Y	V		Y		
12	A	Asbestos			Super spool valve gasket				0.2	Nippon Air Brake	Y	V		Y		
13	A	Asbestos			Lagging				500.0	KHI	PCHM	V		PCHM		
14	A	Asbestos			Reduction gear	Clutch			1.4	KHI/Valqua/V1500	Y	V		Y	M-183	
15	A	Asbestos			CPP valve	Cylinder valve			1.2	KHI/Nippon Pillar/P2000&315	Y	V		Y	M-184	
16	A	Asbestos			Auxiliary turbine	Control valve			0.3	Shinko Kinzoku Ind.	Y	V		Y	M-189	
17	A	Asbestos			Shinko Kinzoku Industries	Sight glass			0.1	Shinko Kinzoku Ind.	Y	V		Y		
18	A	Asbestos				LO regulator				0.1	Shinko Kinzoku Ind./Valqua/V1500	Y		V		Y
19	A	Asbestos				Turning gear				0.1	Shinko Kinzoku Ind.	Y		V		Y
20	A	Asbestos	Lagging					200.0	KHI	PCHM	V	PCHM				
21	A	Asbestos	Heavy FO transfer pump			less than 50g		Heisin Pump/Nippon Pillar/P6501L	Y	V	Y	M-192				
22	A	Asbestos	FO adjective injection pump				0.3	Sakura Seisakusho /Valqua/V1500&2630	Y	V	Y					
23	A	Asbestos	Shafting	Gland packing				NIL		N	V	N	M-185			
24	A	Asbestos	CPP control system	Gasket				NIL	KHI	N	V	N	M-184			



Sample of location map for Inventory for existing ship





Conclusion (1)

➤ **Increasing demand for ship recycling facilities**

- ✓ **The average age of ships dismantled has been increasing for the past 10 years from 25 years to 34 years.**
- ✓ **For the coming 10 years, it is expected that aged ships of approximately 30 million DWT - equivalent to 6 million tons of steel - will exit from the market.**
- ✓ **The number of ship recycling facilities that meet the requirements of the Convention is limited.**
- ✓ **Insufficient recycling capacity has been concerned, and it is necessary to establish supporting mechanism for developing countries.**



Conclusion (2)

➤ **Prompt implementation of the Convention**

- ✓ **International cooperation is indispensable for prompt implementation of the Convention.**
- ✓ **All countries are strongly encouraged to ratify the Convention as early as possible.**

➤ **Role of the relevant industries**

- ✓ **It is important that relevant industries fulfill their obligations.**
 - **Shipbuilders: Development of Inventory at the construction stage**
 - **Operators: Updating Inventory and development of Ship Recycling Plan**
 - **Manufacturers: Development/provision of Material Declaration**
 - **Recycling facilities: Obtain authorization by the Administration, proper management of facilities, and development of ship recycling plan**