Current Situation on Ship Recycling in Korea
- Matters related with shipbuilders -

2007. 11. 15

KSA (DSME)

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Main Topics

- IMO Activities
  - IMO Guidelines
  - Development of international Convention
- Activities in Korea
Ship recycling

Ship Scrapping, Breaking Industry

- Typical 3-D job
- Low cost, very poor environment
- Disregard of health & safety of workers
- Dangerous
- Environmental Pollution
Growing concerns about environmental safety, health and welfare matters in the ship scrapping industry

MEPC 42(1998), Ship recycling was first brought to the attention of the IMO

MEPC 44(2000), Agenda was renamed as Ship recycling from scrapping and establish Correspondence Group

MEPC 49(2003), finalized “IMO Guidelines on Ship Recycling”

Adopted at 23rd session of the Assembly (2003) by resolution A.962(23)
The concept of a 'Green Passport' for ships has been included in draft guidelines on ship recycling currently under discussion at IMO. It is envisaged that such a document, containing an inventory of all materials potentially hazardous to human health or the environment used in the construction of a ship, could accompany the ship throughout its working life. Produced by the shipyard at the construction stage and passed to the purchaser of the vessel, the document would be in a format that would enable any subsequent changes in materials or equipment to be recorded. Successive owners of the ship would maintain the accuracy of the Green Passport and incorporate into it all relevant design and equipment changes, with the final owner delivering it, with the vessel, to the recycling yard.

Draft IMO Guidelines on ship recycling were discussed in detail at the 48th session of the Marine Environment Protection Committee in October, with a view to producing a final draft for adoption by the next IMO Assembly in 2003.

The draft guidelines note that, in the process of recycling ships, virtually nothing goes to waste. The materials and equipment are almost entirely reused. Steel is reprocessed to become, for instance, reinforcing rods for use in the construction industry or as corner castings and hinges for containers. Ships' generators are reused ashore. Batteries find their way into the local economy. Hydrocarbons on board become reclaimed oil products to be used as fuel in rolling mills or brick kilns; light fittings find further use on land etc. Furthermore, new steel production from recycled steel requires only one third of the energy used for steel production from raw materials. Recycling makes a positive contribution to the global conservation of energy and resources and, in the process, employs a large, if predominantly unskilled, workforce. Properly handled, ship recycling is, without question, a "green" industry.

However, the guidelines recognize that, while the principle of ship recycling may be sound, the working practices and environmental standards in the yards often leave much to be desired. While ultimate responsibility for conditions in the yards has to lie with the countries in which they are situated, other stakeholders must be encouraged to contribute towards minimizing potential problems in the yards.

The guidelines have been developed to give advice to all stakeholders in the recycling process, including administrations of ship building and maritime equipment supplying countries, flag, port and recycling states, as well as intergovernmental organizations and commercial bodies such as shipowners, ship builders, repairers and recycling yards.
Voluntary Guidelines

To encourage recycling as the best means to dispose of ships at the end of their operating lives

Major Contents
- Identification of potentially hazardous materials
- Green Passport
- Procedures related to Ship Recycling
- Preparations for Ship recycling
A document providing information with regard to materials known to be potentially hazardous used in the construction of the ship, equipment and systems.

To reduce environmental and safety risks and health and welfare

Maintain the accuracy of the Green Passport throughout its operating life

Final owner deliver the document to the recycling facility with the ship
GP consists of mainly two categories:
Ship information and Inventory of Potentially hazardous materials on Board

I. Ship details
   - Flag, Port,
   - Registered & de-registered Dates,
   - Ship’s identification number (IMO number), Hull number,
   - Ship name, Type of the ship,
   - Ship owner,
   - Class, Shipbuilder,
   - Ship’s main particulars
II. Inventory of Potentially hazardous materials:
with Location and approximate quantity/volume

- Part 1 - Potentially hazardous materials in the ship’s structure and equipment (Construction & Conversion)
- Part 2 - Operationally generated wastes
- Part 3 - Stores

Preparation & update:
- Part 1 usually prepared by Ship yard
- Part 2 & 3 should be prepared by the ship owner prior to the final voyage
**Definition**: harm to human health or the environment identified in the IMDG Code, the Basel Convention, or other international authorities or instruments.

**List of hazardous materials by Recycling industry Code (Appendix 2 of IMO Guidelines)**

A. Operational Substances and Consumables (30 categories)

- Cargo & Dry tank Residues,
- Fuel oil, L.O, Greases & Anti-seize Compounds
- Evaporator Dosing and Descaling Acid
- Paints and Rust Stabilizers
- Refrigerants (R12 or R22), HALON, CO2

-continued-
Acetylene, Propane and Butane
Lead-acid Batteries
PCB and/or PCT and/or PBB
Mercury
Radio-active Material i.e. liquid level indicators
Miscellaneous Medicines & Chemicals
Plastics as covered by MARPOL
Perfluorocarbons (PFCs)

B. Toxic Materials (as part of the ship’s structure)
1. Asbestos
2. Lead-based Paint Coatings on Ship’s Structure
3. Tin-based Anti-fouling Coatings on Ship’s Bottoms
4. Others
### Appendix 3 of IMO Guideline

#### Inventory of Hazardous Materials

**PART 1 - POTENTIALLY HAZARDOUS MATERIALS IN THE SHIP’S STRUCTURE AND EQUIPMENT**

**1A. Asbestos**

(Note: All asbestos containing materials (ACMs) or presumed asbestos containing materials (PACMs) should be prominently labelled as such.)

<table>
<thead>
<tr>
<th>Type of Asbestos Materials (Board, Pipe lagging, Contained)</th>
<th>Location</th>
<th>Approximate quantity/volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Room/Machinery Rooms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam supply piping and hangers (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam exhaust piping and hangers (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relief &amp; safety valves (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous piping outer covering and hangers (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water pipes and hangers (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP Turbine Insulation (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiler drums &amp; casings (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heaters, Tanks etc. (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Machinery Locations e.g. Pump Room, Boiler Room</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitary &amp; Commissary spaces (General)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior decks – including underlay (General)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Caution!! Asbestos containing material (ACM) may be found underneath materials that do not contain asbestos.
# Inventory of Hazardous Materials

## IB. Paint (on vessel’s structure) - Additives

<table>
<thead>
<tr>
<th>Additive (Lead, Tin, Cadmium, Organotins (TBTs), Arsenic, Zinc, Chromium, Strontium, Other)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## IC. Plastic Materials

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Approximate quantity/volume</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## ID. Materials containing PCBs, PCTs, PBBs at levels of 50mg / kg or more

<table>
<thead>
<tr>
<th>Material</th>
<th>Location</th>
<th>Approximate quantity/volume</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Inventory of Hazardous Materials

## 1E. Gases sealed in ship’s equipment or machinery

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Approximate quantity/volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerants (R12/R22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HALON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetylene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 1F. Chemicals in ship’s equipment or machinery

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Approximate quantity/volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-seize Compounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine Additives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antifreeze Fluids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerosene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Spirit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiler/Water Treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>De-ioniser Regenerating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporator Dosing and Descaling Acids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint/Rust Stabilisers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solvents/Thinners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Refrigerants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery Electrolyte</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hotel Service Cleaners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1G. Other Substances inherent in ship’s machinery, equipment or fittings

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Approximate quantity/volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lubricating Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead Acid Batteries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methylated Spirits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epoxy Resins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mercury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radioactive Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part 1. completed by          Date


23rd Assembly, When adopting Guidelines, the issue making Guidelines mandatory was raised

MEPC 51(2004), Establish C.G on Ship recycling

MEPC 53(2005), Agreed develop a new mandatory instrument on recycling

Assembly 24th(2005), Adopted resolution A.981(24) on New Legally Binding Instrument on Ship Recycling

With this Res. MEPC was requested to develop a mandatory instrument

MEPC 54(2006), Draft text submitted by Norway
MEPC 54, 55 & 56 Working Group on ship recycling discussed and further developed the draft text.

Proposed title of the Convention is the “International Convention for the Safe and Environmentally Sound Recycling of Ships”.

Target completion date is year of 2008 and will be adopted 2009 by diplomatic conference.

100th Council (2008) will endorse data for diplomatic conference.
Convention will consists of Articles, Annex & Appendix

- **Articles : 21 Articles**
- **Annex (Regulation)**
  - Chapter 1: General Provisions
  - Chapter 2: Requirements for Ships
    - 1 Part A: Design, Construction, Operation and Maintenance of Ships
    - 2 Part B: Preparation for Ship recycling
    - 3 Part C: Surveys and Certification
  - Chapter 3: Requirements for Ship Recycling Facilities
  - Chapter 4: Reporting Requirements
- **Appendix**
.2 Definition:
-Hazardous material: liable to create hazards to human health and the environment
-Ship: a vessel of any type whatsoever operating or having operated in [an international voyage in] the marine environment

.3 Application:
-Ships, ship recycling facilities
- Shall not apply to any ships less than 500 GT [and solely engaged in domestic voyages and recycled in the state]

.8 Inspection of ships:
-Verifying that there is onboard a valid International Certificate for on Inventory of Hazardous Materials

.17 Entry into force:
-No text is presented because should reflect the total content of a Convention
- **New ship (Reg. 1):**
  - Contracted on or after the entry into force of the Convention
  - Delivery on or after [30][12] months after the entry into force of the Convention

- **Inventory of Hazardous Materials (Reg. 5):**
  - New ship shall have onboard an Inventory
  - Approved by the Administration
  - Specific to each ship
  - Identify as Part1, hazardous materials listed in Appendix 1 & 2, their location and approximate quantities
  - Prior to recycling incorporate Part II, Part III and be verified
  - Existing ships shall prepare Part 1 as far as practicable not later than 5 years after the entry into force of the Convention
Preparation for ship recycling (Ch II, Part B)
- Only be recycled at authorised recycling facilities
- Minimize the amount of cargo residues, bunker residues and wastes
- Complete the Inventory
- Provide all available information to the recycling facility for the development of the ship recycling plan
- Ship recycling plan must be developed (by the recycling facility)
- Certified as ready for recycling by the Administration
Surveys and certification (Ch II, Part C)
- Initial, Periodical, Additional and Final survey

- Initial survey
  - Before the ship is put in service
  - Verify Part 1 of Inventory
  - International Certificate on Inventory of Hazardous Materials shall be issued

- Periodical survey: Verify Part I of inventory at intervals not exceeding 5 years

- Final Survey:
  - Verify that the Inventory of Hazardous materials and Ship recycling plan
  - International Ready for Recycling Certificate shall be issued after a final survey
Activities in Korea

General Status

- **Involved Organization**
  - Legal matters: Korea Coast Guard, Ministry of Marine Affairs & Fisheries
  - Ship builder: Korea Ship builders’ Association
  - Ship Owner: Korea Ship Owners’ Association
  - Vendors: Marine Equipment research institute
  - Recycling Facility: No Recycling Facility in Korea

- **Major Activities**
  - IMO Working Group participation
  - ISO TC8 Working Group 1
  - New ship Owners’ request on Green passport
  - Korea ship yards’ TFT on Ship Recycling & DSME preparation
Activities in Korea - Ship Recycling TFT

**TFT Members**
- DSME (Leading Company), SamSung, HanJin, Hyundai MiPo, Hyundai SamHo, HHI, STX, DSEC, KSA, KR
- Leader: Mr. W.H. Shin (DSME)
- Secretary: Mr. I.G. Lee (DSME)
- E-mail Communication, Work Shop

**TFT Target / Goals**
- Standard Format of Green passport
- Review of Ship Recycling Plan
- Monitoring & Understanding of Mandatory IMO Convention
- Job Procedure & Process
Outcome of TFT

- Review and Understanding of IMO Guideline (A962.(23)) & New IMO Convention
- Review and Understanding of Ship Recycling Plan
- Develop Standard Green Passport format – applicable for all Korean ship yards
- Green Passport Job Procedure & Process review:
  - Set up Ship recycling related works, Role of each party, Vendor involvement
- Detail Provision for application: Vendor request Letter, Requesting Format, Involved cost, Key person
**Standard Green Passport Format**
- Based on Appendix 3 of IMO Guideline A.962(23)
- Reflected output from IMO MEPC
- Set up documents contents: Vessel Identification, Introduction, Ship Executive Summary, Inventory, History

**Green Passport Job Procedure & Process**
Set up various ship recycling related works
- Key person, Specification description
- Design Consideration
- Role of each party: Yard, Owner, Vendor
- Vendor involvement
- Detail Provision for preparation: Vendor request Letter, Vendor requesting Format, Internal guideline (procedure, activities and time)
- Involved cost evaluation: M/H, Classification fee
Activities in Korea

Green passport Statistics

- Number of ships prepared Green Passport in Korea: about 65 vessels
- Ship Owners: KOTC, WALLENIUS, EXMAR, VELA, T&H, ANANGEL, AP MOLLER, BERGESEN, SHELL, KRISTEN, BWSHIPPING, TEEKAY, NITC, STARTANKER, LAURITZEN KOSAN A/S, OLDENDORFF, GEM, GEDEN, SAMCO, THENAMARIS, OOCL, EURONAV, ...
- Type of vessels: Crude Oil Tanker, Product Carrier, Ro-Ro, LPGC, LNGC, Container, Bulk Carrier
- Number of ships applying GP, DSME
  - Completed: 23 vessels
  - On going & near future: 26 vessels
Remarks on preparation GP

- PCB: Polychlorinated biphenyl, not Print Circuit Board
- Some vendor record Asbestos as used material: to be checked whether misunderstanding or SOLAS permitted cases
- Some sub-contractor’s sub-contract may refuse to inform used material. They consider it is kind of business confidential
- DNV CLEAN notation: DNV environmental notation CLEAN requires Green passport (Contracted after Jan, 2006)
- Classification fee is different from each Classes, to be checked. Fee for series vessel is different from first vessel.
Activities in Korea - DSME

Remarks on preparation GP

- Starting time of making Inventory: Keel laying – 2 months
- Completion of draft inventory: K/L – 1 month
- Volume of Inventory: about 25~30 page, 300~350 items
- Problem and unclear aspect of preparing GP
  - Minimum contents of material to be reported is not clear (MEPC 56/3/2 may be referred to, but materials are different)
  - List of material to be listed in Part 1 is not clear in the IMO guidelines.
- The first GP in the world approved by class(LR) is MV GRANATINA built in DSME for SHELL (2004)
- Quality of inventory need to be improved and getting improving due to experience of vendors.
Introduction of TFT result incl. GP format to outside
Application of Standard Green passport format
Feedback & Improvement of involved works
Enhance involvement of Vendor & improve quality
Make GP as routine usual work
Continuous monitoring and review IMO activity
Participation of IMO WG if necessary
Readily applicability before Convention adoption
Reasonable & Acceptable service to clients at early stage
The House of Wisdom & Innovation

The End – Q&A
Ship Recycling TFT – Task of Parties

- Identification of Hazardous material
- Minimize the use of Hazardous materials
- Preparation of the Green passport (Part I)
- Ensure reliable Inventory of hazardous materials
- Deliver “International Certificate for on Inventory of Hazardous Materials” (After Convention)
- Design facilitating removal of Hazardous materials & recycling*
- Limiting the use of materials difficult to recycle*
- Enhance involvement of Vendor

*It is not clear those design requirements will be included in the Convention
Ship Recycling TFT – Task of Parties

Ship Owner

- Updating & Preparation of Green passport (Especially Part II, III of the Inventory)
- Carrying “International Certificate on Inventory of Hazardous Materials” (After Convention)
- Update Certificate according to rule requirement
- Minimization of the use of potentially hazardous substances
- Minimization of waste generation
- Selection of the recycling facility & Contracting
- Provide ship information to the recycling facility
- Preparation of Recycling & Recycling Plan
- Preparations to prevent pollution
- Get the “International Ready for Recycling Certificate” (After Convention)
Identification of Hazardous material
Minimize the use of Hazardous materials
Design facilitating removal of Hazardous materials & recycling *
Limiting the use of materials difficult to recycle*
Preparation of Inventory of hazardous materials used in the equipment and include it in the V/D DWG
Ensure reliable Inventory of hazardous materials
Enhance involvement of sub-contractor
List up all used materials in the drawing
Declaration of conformity for Hazardous materials
* Unclear in the Convention
- Standard Spec. description: “Green Passport (Inventory of Potentially hazardous materials on board) according to IMO Res. A.962(23)”
- Cost evaluation: Classification fee, M/H
- Restrict use of hazardous materials prohibited in the MARPOL & other IMO convention such as Asbestos, TBT, PCB and ODS
- Key Man: Project Leader (Design)
- Initiate of Job: General term or independent request to Vendors at the K/L – 2 months
- Vendor requesting: Standard request letter, standard format for vendors, Brief introduction
- Hazardous materials: Materials mentioned in IMO Guidelines + Appendix 1 & 2 of draft convention
Requirements to Vendors

- General Term: Will be required in purchasing order specification to prepare inventory of Hazardous materials according to A.962(23) in General term if used.

- Will be required to include Inventory in the V/D DWG.

- Will be required to describe used material detail in the V/D DWG.

- DSME requires Declaration of conformity by vendor (Vendor requesting format includes vendor’s declaration).
Green Passport Process

DSME
- Identification
- Planning
- Requesting
- Data Collection
- GP preparation
- SOC or Cert.

Manufacturer
- Identification
- Material review
- Inventory
- Material information
- Declaration

Material data
- Inventory

Class
- Review
- SOC or Cert.

Upstream Supplier

Green Passport (part I)
Vessel Identification

Introduction

Potentially hazardous materials, which may be on board vessels delivered to recycling yards (based on Appendix 2 of IMO A.962(23), & IMO draft Guideline for the development of Inventory by Japan & Germany)

Inventory of Potentially hazardous materials on Board
- Executive Summary
- Part 1. Potentially dangerous materials in the ship’s structure and equipment
- Part 2. Operationally generated wastes
- Part 3. Stores

Record of Changes
1B. Paint – Additives on vessel’s structure

<table>
<thead>
<tr>
<th>Name of Paint</th>
<th>Specified chemical substances</th>
<th>Location</th>
<th>Approximate Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti fouling TIN Free AF</td>
<td></td>
<td>Under water (Flat bottom &amp; side)</td>
<td>24,000 Liters</td>
</tr>
</tbody>
</table>

1C. Plastic Materials

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>System / Machinery</th>
<th>Approximate Quantity/Volume</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garbage Bin</td>
<td>A Deck (Exposed Area)</td>
<td>7/24L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C – PUC Pipe</td>
<td>(All Deck)</td>
<td></td>
<td>547Kg</td>
<td></td>
</tr>
</tbody>
</table>
Standard GP format – for vendors

“GREEN PASSPORT”
Inventory of potentially hazardous materials
(In accordance to IMO resolution A.862(23) IMO Guidelines on Ship Recycling)

Vessel identification

- IMO Number:
- Hull Number:
- Name of Vessel:
- Type of Ship:
- Port of Registry:
- Name of the Ship owner:
- Classification Society:
- Main Particular
  - Length overall: m
  - Breadth (Moulded): m
  - Depth (Moulded): m
- Name of the Shipbuilder: Daewoo Ship Building & Marine Engineering Co. Ltd.

Introduction

The green passport (Inventory of potential hazardous materials) for ships is a document facilitating the application of the Guidelines for Ship’s Recycling, providing information with regard to materials known to be potentially hazardous utilized in the construction of the ship, its equipment and system.

Main reference is made to IMO Resolution A.862(23) “IMO Guidelines on Ship Recycling”.

Further reference is made to 9th “Industry Code of Practice on Ship Recycling” and complement other international guidelines addressing this issue; notably those produced by the Conference of Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal focusing on issues related to ship recycling facilities.

The Green Passport should accompany the ship throughout its operating life.

Successive owners of the ship should maintain the accuracy of the Green Passport and incorporate into it all relevant design and equipment changes, with the final owner delivering the document, with the ship, to the recycling facility.

To this end, we kindly request you to complete the attached form, writing the details in the applicable columns when the components or equipment supplied by your company have any of the materials listed in the attached form. For details please refer to attached form.

POTENTIALLY HAZARDOUS MATERIALS WHICH MAY BE ON BOARD SHIPS DELIVERED TO RECYCLING FACILITIES
(Appendix 2 of A.862(23) based on Annex 1 to the “Industry Code of Practice on Ship Recycling, August, 2001”)

This list is intended to be used for the identification of potentially hazardous materials.

A. Operational Substances and Consumables
1. Cargo Residues including Slips
2. Dry tank Residues
3. Fuel oil, Diesel oil, Gas Oil, Lubricating oil, Greases & Anti-seize Compounds
4. Hydraulic oil
5. Waste oils (contents of sludge tank)
6. Antifreeze fluid
7. Ketone and White Spirit
8. Boiler and Feed Water Treatment Chemicals
9. Boiler and Feed Water Test Re-agents
10. De-ioniser Regenerating Chemicals
11. Evaporator Drying and Descaling Acid
12. Domestic Water Treatment Chemicals
13. Paints and Rust Stabilizers
14. Solvents and Thinners
15. Refrigerants(R12 or R22)
16. HALON
17. CO2 (in cylinders – engine room fire protecting)
18. Acetone, Propylene and Butane
19. Hotel Services Cleaners
20. Lead-acid Batteries
21. Battery Electrolyte
22. PCB and/or PCT and/or PBB at levels of 50mg/kg or more.
23. Mercury
24. Radio-active Material i.e. liquid level indicators
25. Miscellaneous Medicines
26. Insecticide Spray
27. Miscellaneous Chemicals such as Alcohol, Methylated Spirits, Epoxy Resins, etc.
28. Plastics as covered by MARPOL
29. Raw and Treated Sewage

B. Toxic Materials (as part of the ship’s structure)
1. Asbestos
2. Lead-based Paint Coatings on Ship’s Structure
3. Tin-based Anti-fouling Coatings on Ship’s Bottoms.
4. Others.
### Appendix 1

**Items to be listed in the Inventory of Hazardous Materials** (according to draft International convention for the safe and environmentally sound recycling of ships)

#### TABLE A. Materials listed in Appendix 1 of the Convention

<table>
<thead>
<tr>
<th>No.</th>
<th>Materials</th>
<th>Inventory</th>
<th>Threshold level</th>
<th>Not to be developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1</td>
<td>Asbestos</td>
<td>Part 1, Part 2, Part 3</td>
<td>no threshold level</td>
<td>x</td>
</tr>
<tr>
<td>A.2</td>
<td>Polychlorinated Biphenyls (PCBs)</td>
<td>Part 1, Part 2, Part 3</td>
<td>50 mg/kg</td>
<td>x</td>
</tr>
<tr>
<td>A.3</td>
<td>Ozone Depleting Substances</td>
<td>Part 1, Part 2, Part 3</td>
<td>no threshold level</td>
<td>x</td>
</tr>
<tr>
<td>A.4</td>
<td>Organochlorine compounds</td>
<td>Part 1, Part 2, Part 3</td>
<td>2500 mg/kg</td>
<td>x</td>
</tr>
</tbody>
</table>

#### TABLE B. Materials listed in Appendix 2 of the Convention

<table>
<thead>
<tr>
<th>No.</th>
<th>Materials</th>
<th>Inventory</th>
<th>Threshold level</th>
<th>Not to be developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1</td>
<td>Cadmium and Cadmium Compounds</td>
<td>Part 1, Part 2, Part 3</td>
<td>150 mg/kg</td>
<td>x</td>
</tr>
<tr>
<td>B.2</td>
<td>Hexavalent Chromium and Hexavalent Chromium Compounds</td>
<td>Part 1, Part 2, Part 3</td>
<td>10,000 mg/kg</td>
<td>x</td>
</tr>
<tr>
<td>B.3</td>
<td>Lead and Lead Compounds</td>
<td>Part 1, Part 2, Part 3</td>
<td>1,000 mg/kg</td>
<td>x</td>
</tr>
<tr>
<td>B.4</td>
<td>Mercury and Mercury Compounds</td>
<td>Part 1, Part 2, Part 3</td>
<td>1 mg/kg</td>
<td>x</td>
</tr>
<tr>
<td>B.5</td>
<td>Polychlorinated Biphenyls (PCBs)</td>
<td>Part 1, Part 2, Part 3</td>
<td>1,000 mg/kg</td>
<td>x</td>
</tr>
<tr>
<td>B.6</td>
<td>Polychlorinated Diphenyls (PCDDs)</td>
<td>Part 1, Part 2, Part 3</td>
<td>1,000 mg/kg</td>
<td>x</td>
</tr>
<tr>
<td>B.7</td>
<td>Polychlorinated Biphenyls (PCBs)</td>
<td>Part 1, Part 2, Part 3</td>
<td>no threshold level</td>
<td>x</td>
</tr>
<tr>
<td>B.8</td>
<td>Radiological Substances</td>
<td>Part 1, Part 2, Part 3</td>
<td>1%</td>
<td>x</td>
</tr>
<tr>
<td>B.9</td>
<td>Carbon Chlorinated Paraffins (Alkenes, C13-C15, Isomer)</td>
<td>Part 1, Part 2, Part 3</td>
<td>no threshold level</td>
<td>x</td>
</tr>
</tbody>
</table>

---

**PART 1 POTENTIALLY DANGEROUS MATERIALS IN THE SHIP’S STRUCTURE AND EQUIPMENT**

<table>
<thead>
<tr>
<th>No.</th>
<th>Materials</th>
<th>Application</th>
<th>Location</th>
<th>Approximate Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A.</td>
<td>Asbestos</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1B.</td>
<td>Paint – Additives on vessel structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1C.</td>
<td>Plastic Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**INVENTORY OF POTENTIALLY HAZARDOUS MATERIALS ON BOARD**

(Adapted from Paragraph 5 and Appendix 3 of IMO Res. A.892(20) as applicable)

- **Equipment Name/Description:**
- **Material Identification Reference No.:**
- **General Description:**
- **Quantity:**
- **Material Name:**
- **Type:**
- **Emission Control System:**
- **Accountability:**
- **Date:**
- **Remarks:**

---

**Notes:**

- 1. Please make the table in two columns, with the columns as follows: Name of Person in Charge and Notice to all concerned.
- 2. The first name in the list is the one who shall be held responsible for the correctness of the information.
- 3. Other columns are for the convenience of the reader and shall not be obligatory.
- 4. The table shall be signed by the person in charge of the record, and the person in charge of the management of the vessel, and the date of signing shall be indicated.

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