

IMO GUIDELINES ON **SHIP RECYCLING**

CONSOLIDATED EDITION 2006

including
MEPC/Circ. 466
"Gas-free-for-hot-work" certification



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Foreword

A.962(23) and A.980(24) (consolidated text of guidelines)

The 23rd session of the IMO Assembly, having noted the growing concerns about environmental safety, health and welfare matters in the ship recycling industry, and the need to reduce the environmental, occupational health and safety risks related to ship recycling and, at the same time, securing the smooth withdrawal of ships that have reached the end of their operating lives, and having considered the Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships* adopted by the Sixth Meeting of the Conference of Parties to the Basel Convention, and the Guidelines on Safety and Health in Shipbreaking† developed by the International Labour Organization (ILO), and also the Code of Practice on Ship Recycling developed by the shipping industry,‡ adopted the IMO Guidelines on ship recycling by Assembly resolution A.962(23) on 5 December 2003.

The IMO Guidelines on ship recycling recognise that, in order to contribute towards improvements in ship recycling, it is necessary to consider the ship throughout its life cycle, and also that the use of hazardous materials should be minimized in the design, construction and maintenance of ships, without compromising their safety and operational efficiency, and that there is a need to prepare ships for recycling in such a manner as to reduce environmental and safety risks and health and welfare concerns as far as practicable.

Furthermore, the 24th session of the IMO Assembly, recognising the need to keep the IMO Guidelines on ship recycling updated in the light of experience gained in their implementation, adopted amendments to the IMO Guidelines on ship recycling by Assembly resolution A.980(24) on 1 December 2005, urging Governments to apply the IMO Guidelines on ship recycling as amended.

The present publication contains the consolidated text of the IMO Guidelines on ship recycling adopted by Assembly resolution A.962(23), as amended by

* Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships adopted by the Sixth Meeting of the Conference of Parties to the Basel Convention on 13 December 2002, (see www.basel.int).

† Guidelines on Safety and Health in Shipbreaking developed by the International Labour Organization (ILO), (see www.ilo.org/public/english/protection/safework/sectors/shipbrk/index.htm).

‡ In co-operation with other industry organizations, ICS has produced the “Industry Code of Practice on Ship Recycling”, outlining the measures that shipowners should be prepared to take prior to recycling (see www.marsec.org/recycling).

Assembly resolution A.980(24), while also referring to the existence and relevance of the guidelines on the same subject by ILO and by the Basel Convention.

MEPC/Circ.466 (MEPC Circular on gas-free-for-hot-work certification)

The Marine Environment Protection Committee, at its fifty-third session (18 to 22 July 2005), noting that reports of explosions at recycling facilities during cutting operations are all too frequent with life threatening consequences, agreed to urge all involved parties to give particular emphasis to the “gas-free-for-hot-work” certification needed for the implementation of the IMO Guidelines on ship recycling, and in this respect, the Committee adopted MEPC.Circ.466. The text of the circular has been included in this publication in view of its relevance to the Guidelines on ship recycling.

A.981(24) (the future IMO mandatory instrument)

It should also be noted that the 24th session of the IMO Assembly, recognizing the urgent need for the Organization to contribute to the development of an effective solution to the issue of ship recycling, considered that the above-mentioned objective may best be achieved by establishing a new legally-binding IMO instrument providing globally applicable ship recycling regulations for international shipping and for ship recycling facilities.

The 24th session of the IMO Assembly therefore adopted resolution A.981(24) which requested the Marine Environment Protection Committee to develop a new legally-binding instrument on ship recycling that would provide regulations for:

- .1 the design, construction, operation and preparation of ships so as to facilitate safe and environmentally sound recycling, without compromising the safety and operational efficiency of ships;
- .2 the operation of ship recycling facilities in a safe and environmentally sound manner; and
- .3 the establishment of an appropriate enforcement mechanism for ship recycling (certification/reporting requirements);

It may be noted that resolution A.981(24) requests IMO’s Marine Environment Protection Committee to work towards completion of the above-mentioned draft instrument in time for its consideration and adoption in the biennium 2008–2009.

The same resolution also urges Governments and all involved stakeholders, in the meantime, to apply the IMO Guidelines on ship recycling without delay.

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1 INTRODUCTION

1.1 Ships, at some stage, reach the end of their operating life. The life cycle for most ships, from “cradle to grave” or “makers to breakers”, gives a life span of operation of 20–25 years, or more. In 2001, the OECD noted an increasing casualty rate for older ships remaining in operation, especially for bulk ships and tankers. The steady withdrawal of older ships and their replacement by new tonnage, therefore, is a natural commercial process which provides the opportunity for the introduction of safer and more environmentally friendly designs, greater operating efficiency and a general reduction in marine risk.

1.2 In general, recycling is one of the basic principles of sustainable development. For the disposal of time-expired ships there are few alternatives to recycling – lay-up only postpones the issue; there is only a limited opportunity to convert ships for other uses such as storage facilities, breakwaters or tourist attractions; scuttling, strictly controlled by the London Convention, gives no opportunity for the steel and other materials and equipment in a ship to be recycled.

1.3 So, recycling is, generally, the best option for all time-expired tonnage. Furthermore, demand for ship recycling is expected to rise in the near future as ships, particularly oil tankers, which do not conform to the new international requirements set by the MARPOL Convention, reach the end of their commercial lives.

1.4 While the principle of ship recycling is sound, the working practices and environmental standards in the recycling facilities often leave much to be desired. Although responsibility for conditions in the recycling facilities has to lie with the countries in which they are situated, other stakeholders can contribute towards minimising potential problems related to health, safety and protection of the environment in the recycling facilities and should apply these Guidelines.

1.5 These Guidelines have been developed to give guidance to all stakeholders in the ship recycling process. This includes flag, port and recycling States, authorities of shipbuilding and maritime equipment supplying countries, as well as relevant intergovernmental organizations and commercial bodies such as shipowners, shipbuilders, marine equipment manufacturers, repairers and recycling facilities. Additional stakeholders include workers, local communities, environmental and labour bodies.

1.6 These Guidelines seek to:

- .1** encourage recycling as the best means to dispose of ships at the end of their operating lives;

- .2 provide guidance in respect of the preparation of ships for recycling and minimising the use of potentially hazardous materials and waste generation during a ship's operating life;
- .3 foster inter-agency co-operation; and
- .4 encourage all stakeholders to address the issue of ship recycling.

1.7 In general, these Guidelines accept that the obligation for environmental and worker protection in ship recycling facilities must rest with the recycling facility itself and with the regulatory authorities of the country in which the recycling facility operates. Nevertheless, it is acknowledged that shipowners and other stakeholders have a responsibility to address the issues involved.

2 APPLICATION

2.1 These Guidelines have been developed to provide guidance to flag, port and recycling States, shipowners, shipbuilders, marine equipment suppliers, and recycling facilities as to “best practice”, which takes into account the ship recycling process throughout the life cycle of the ship.

2.2 They take into account the “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[†] and those of the International Labour Organization addressing working conditions at the recycling facilities.[‡] Further information on the above-mentioned guidelines is provided in sections 9.5 and 9.6 of these Guidelines. The provisions of other international instruments, or work of their governing bodies, may be applicable to those ship recycling activities addressed by these Guidelines. The Montreal Protocol on Substances that Deplete the Ozone Layer, the Stockholm Convention on Persistent Organic Pollutants (POPs), the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1972) and the United Nations Convention on the Law of the Sea are relevant.

^{*} In co-operation with other industry organizations, ICS has produced the “Industry Code of Practice on Ship Recycling”, outlining the measures that shipowners should be prepared to take prior to recycling (see www.marisec.org/recycling).

[†] Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships adopted by the Sixth Meeting of the Conference of Parties to the Basel Convention on 13 December 2002, (see www.basel.int).

[‡] Guidelines on Safety and Health in Shipbreaking developed by the International Labour Organization (ILO), (see www.ilo.org/public/english/protection/safework/sectors/shipbrk/index.htm).

3 DEFINITIONS

For the purpose of these Guidelines:

Administration means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly the flag of a State, the Administration is the Government of that State. With respect to fixed or floating platforms engaged in exploration and exploitation of the sea-bed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purpose of exploration and exploitation of their natural resources, the Administration is the Government of the coastal State concerned.

Existing ship means a ship which is not a new ship.

Hazardous material means materials posing harm to human health or the environment identified in the IMDG Code, the Basel Convention, or other international authorities or instruments.

New ship means a ship:

- .1 for which the building contract is placed on or after 31 December 2003; or
- .2 in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 30 June 2004; or
- .3 the delivery of which is on or after 31 December 2006.

Organization means the International Maritime Organization (IMO).

Recycling facility means a site, yard or facility used for the recycling of ships which is authorized or permitted for this purpose by the competent authority of the State where the site, yard or facility is located (recycling State).

Ship means a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating platforms.

Shipowner means the person or persons or company registered as the owner of the ship or, in the absence of registration, the person or persons or company owning the ship. However, in the case of a ship owned by a State and operated by a company which in that State is registered as the ship's operator, "owner" shall mean such company. This term also includes those who have ownership of the ship for a limited period pending its sale to a recycling facility.

Ship recycling means all associated operations including, mooring or beaching, dismantling, recovery of materials and reprocessing.

The *operating life* of a ship means the time when it is capable of performing its current functions.

4 IDENTIFICATION OF POTENTIALLY HAZARDOUS MATERIALS

4.1 The principal materials of a ship (e.g., steel, aluminium) are not an overriding concern from the standpoint of human health or marine pollution. However, there are a number of potential sources of concern that should be addressed such as:

- .1 fuel, lubricants, and coolants;
- .2 floatable materials (e.g., plastics, Styrofoam insulation);
- .3 materials possibly containing PCBs such as wiring insulation;
- .4 sludges;
- .5 harmful aquatic organisms in ballast water; and, currently (on older ships)
- .6 asbestos used as insulation material and in accommodation panelling.

4.2 Items on ships that may potentially contain substances of concern include:

- .1 electrical equipment (e.g., transformers, batteries, accumulators);
- .2 coolers;
- .3 scrubbers;
- .4 separators;
- .5 heat exchangers;
- .6 storage facilities for production and other chemicals;
- .7 tanks, diesel tanks including bulk storage tanks;
- .8 stored solvents, and other chemical stocks;
- .9 paints;
- .10 electrical cabling installed before 1975 (plastic covering may contain PCBs);
- .11 sacrificial anodes;
- .12 fire extinguishing and fire fighting equipment;
- .13 piping, valves and fittings;
- .14 pumps and compressors;
- .15 engines and generators;
- .16 oil sumps;
- .17 hydraulic systems; and
- .18 light fittings and fixtures.

4.3 In identifying potentially hazardous materials on board ships, there are two key lists to consider for guidance, which are set out as appendices 1 and 2 to these Guidelines: appendix 1 is based on the “List of Hazardous Wastes and Substances under the Basel Convention that are relevant to Ship Dismantling” (appendix B to the “Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships”), and appendix 2 is based on the list of “Potentially hazardous materials which may be on board vessels delivered to recycling yards (annex 1 of the “Industry Code of Practice on Ship Recycling”).

5 GREEN PASSPORT

5.1 The Green Passport for ships is a document facilitating the application of these Guidelines providing information with regard to materials known to be potentially hazardous utilized in the construction of the ship, its equipment and systems. This 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.

5.2 The Green Passport should contain, at least, the following information:

.1 Ship details:

- .1** the name of the State whose flag the ship is entitled to fly;
- .2** the date on which the ship was registered with that State;
- .3** the date on which the ship ceased to be registered with that State.
- .4** the ship’s identification number (IMO number);
- .5** hull number on new-building delivery;
- .6** the name and type of the ship;
- .7** the port at which the ship is registered;
- .8** the name of the shipowner and its address;
- .9** the name of all classification society(ies) with which the ship is classed;
- .10** the ship’s main particulars (Length overall (LOA), Breadth (moulded), Depth (moulded), Lightweight);
- .11** shipbuilder’s name and address;

Any changes relating to these “ship details” should be recorded. In the case of ships subject to SOLAS chapter XI-1, regulation 5, this requirement should be satisfied by the surrender, to the recycling

facility, of a copy of the Continuous Synopsis Record (CSR) and the Certificate of Build produced by the shipbuilder.

- .2** Inventory of the materials known to be potentially hazardous, containing the location and the approximate quantity/volume of each identified material on board the ship, split into the following parts:

Part 1 – Potentially hazardous materials in the ship’s structure and equipment

Part 2 – Operationally generated wastes

Part 3 – Stores

5.3 Part 1 of the inventory of potentially hazardous materials present in the ship’s structure and equipment should be prepared:

- .1** for new ships by the shipbuilder, in consultation with the equipment manufacturers, at the construction stage, and passed to the shipowner;
- .2** for existing ships by the shipowner, as far as is practicable and reasonable, by reference to ship’s plans, drawings, manuals, technical specifications and ship stores manifests, in consultation with the shipbuilder, equipment manufacturers and others as appropriate.

5.4 Any changes relating to Part 1 of the inventory should be recorded so as to provide updated and current information together with a history of the changes.

5.5 Ship details referred to in paragraph 5.2.1 should be included in the Green Passport by the shipowner.

5.6 Inventories of operationally generated wastes (Part 2 of the inventory) and potentially hazardous items carried as stores (Part 3 of the inventory) should be prepared by the shipowner prior to or during the final voyage to the recycling facility and handed to the recycling facility on delivery of the ship, as part of the Green Passport.

5.7 The format contained in appendix 3 may be used as a model for the preparation of the inventory referred to in paragraph 5.2.2.

5.8 Administrations, designers, shipbuilders, and equipment manufacturers should take measures to facilitate the preparation of the Green Passport.

6 PROCEDURES FOR NEW SHIPS RELATED TO SHIP RECYCLING

6.1 Minimization of hazardous substances used in the construction of new ships and their equipment

6.1.1 Some of the problems associated with ship recycling might be addressed at the design and construction stage, not only in relation to the ships themselves but also in respect of ships' equipment. The first step is to identify any potentially hazardous materials which might be incorporated, as a matter of routine, in the structure of ships and their equipment (see section 4) and, where practicable, consider using less hazardous alternatives.

6.1.2 The second step is to minimize hazardous materials generated during the operating life of a ship and at the end of a ship's life. Shipbuilders should already be aware of the need to minimize emissions and hazardous wastes to a level as low as reasonably achievable.

6.1.3 The initial stages might include an evaluation of:

- .1 the type, amount and potential hazard of materials utilized and their location on board a ship;
- .2 the activities expected during the operation of the ship and any potentially hazardous wastes which might be generated; and
- .3 the feasibility of addressing the potential for hazardous waste generation by considering:
 - .1 product reformulation installing components utilizing less potentially hazardous materials;
 - .2 cleaner production technologies which generate less wastes;
 - .3 process modification to generate less waste;
 - .4 input substitution utilizing less potentially hazardous consumables or those which generate less waste; and
 - .5 on-site, closed-loop recycling systems that recycle wastes on board the ship.

6.1.4 Ship designers and shipbuilders are encouraged to take due account of the ship's ultimate disposal when designing and constructing a ship, by:

- .1 using materials which can be recycled safely and in an environmentally sound manner; and
- .2 minimizing the use of materials known to be potentially hazardous to health and the environment.

6.1.5 In general terms, if opportunities exist, ship or equipment designers should recommend designs to ship operators that minimize or prevent waste at source and at the end of the operating life of the ship. Similarly, shipowners and

operators should ask for such design considerations for new buildings and retrofits.

6.1.6 Administrations and the competent authorities of shipbuilding States are encouraged to advise shipbuilders to limit the use of hazardous materials in the construction of ships.

6.1.7 The competent authorities of shipbuilding States have a role in encouraging research into the use of less potentially hazardous materials in the construction of ships and promoting the use of techniques which, without compromising safety or operational efficiency, contribute towards the facilitation of the recycling operation.

6.1.8 Substances prohibited or restricted by international conventions such as the Stockholm Convention on Persistent Organic Pollutants (POPs), the Montreal Protocol on Substances that Deplete the Ozone Layer, and the International Convention on the Control of Harmful Anti-fouling Systems on Ships, should not be used in the construction, refit and repair of ships.

6.2 Design of ships and ships' equipment to facilitate recycling and removal of hazardous materials

6.2.1 Ship designers and shipbuilders, without compromising safety or operational efficiency, should take due account of the ship's ultimate disposal when designing and constructing a ship, by considering:

- .1 structural designs that could facilitate ship recycling;
- .2 equipment designs that facilitate removal from ships during recycling;
- .3 the use of structural materials that can be readily recycled;
- .4 providing to the new owner a brief technical document advising on the optimal approach for recycling the ship;
- .5 the use of recycled materials in ship or equipment designs;
- .6 limiting the use of materials that are difficult to separate into their specific individual substances or components; and
- .7 taking measures to facilitate the removal of such materials.

6.2.2 Manufacturers of marine equipment that contain hazardous substances should be encouraged to design them so as to facilitate the safe removal of those substances, or give advice as to how such substances can be safely removed, at the end of the working life of the equipment.

6.3 Preparation of the Green Passport

Shipowners and shipbuilders should prepare the Green Passport in accordance with section 5.

6.4 Minimization of the use of potentially hazardous substances

Shipowners should make every effort to minimize the amount of potentially hazardous materials on board the ship, including those carried as stores, during routine or major maintenance or major conversions, seeking assistance from other parties as necessary.

6.5 Minimization of waste generation

Ship operators should continuously seek to minimize hazardous waste generation and retention during the operating life of a ship and at the end of a ship's life.

7 PROCEDURES FOR EXISTING SHIPS RELATED TO SHIP RECYCLING

7.1 Preparation of the Green Passport

Shipowners should prepare the Green Passport in accordance with section 5.

7.2 Minimization of the use of potentially hazardous substances

7.2.1 Shipowners should make every effort to minimize the amount of potentially hazardous materials on board the ship, including those carried as stores, during routine or major maintenance or major conversions, seeking assistance from other parties as necessary.

7.2.2 The points listed in section 6.1.3 for new ships should be considered when seeking to minimize hazardous materials aboard existing ships.

7.3 Minimization of waste generation

Ship operators should continuously seek to minimize hazardous waste generation and retention during the operating life of a ship and at the end of a ship's life.

8 PREPARATIONS FOR SHIP RECYCLING

8.1 Selection of the recycling facility

8.1.1 A recycling facility should have the capability to recycle the ships it purchases in a manner consistent with national legislation and relevant



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international conventions. This capability should be monitored by the appropriate national authority and should be in compliance, in particular, with the relevant Guidelines developed by ILO (Guidelines on Safety and Health in Shipbreaking) and the Basel Convention (Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships).

8.1.2 Information on the above is not, currently, widely available. Competent authorities in recycling States should assess the capabilities of their recycling facilities and make available the results of those assessments.

8.1.3 In selecting the recycling facility, a shipowner, in consultation with competent authorities of the recycling State, should consider, in the context of the above guidelines, the working practices and facilities in the ship recycling facility in question, including:

- .1 its ability to handle safely, and dispose of properly, any potentially hazardous materials that may be present in the ship such as asbestos, PCBs, halons, petroleum products and other residues;
- .2 the provision of appropriate and sufficient personal protection and safety equipment;
- .3 the ability of a recycling facility to maintain and monitor the ship in a gas free condition and approved “fit for hot work” during the whole process of ship recycling; and
- .4 other information such as safety records, training programmes for workers and assessment of the work quality.

8.1.4 Some recycling facilities may be capable of recycling almost any ship in an “as is” condition. Others, even though technically advanced, may not be able to properly manage any resulting hazardous materials or wastes. In such cases, shipowners should, following discussions with the recycling facility, arrange to remove and properly dispose of those materials that the facility cannot manage.

8.1.5 Where, after investigation, it is assessed that the selected recycling facility has no means of managing hazardous materials or wastes in a manner consistent with national law and relevant international instruments and guidelines, the shipowner should arrange for the removal of those materials to another appropriate facility or ensure that the facility obtains the technical capability to do so.

8.1.6 While recycling facility selection is made on a commercial and risk management basis, shipowners should select facilities that are best capable of managing all relevant hazardous materials and wastes arising from the recycling process.

8.1.7 In addition to the considerations set out above, the shipowner should consider the following:

- .1 establishing the procedures to be used by the recycling facility in removing and properly disposing of any potentially hazardous materials;
- .2 specifying the method of recycling in the recycling contract;
- .3 reserving in the recycling contract the right to monitor the recycling process; and
- .4 contractual provisions for incentive payments to ensure the recycling is carried out in accordance with the relevant guidelines.

8.1.8 The shipowner, having selected a recycling facility to recycle a ship, should inform the Administration and the competent authority of the recycling State accordingly.

8.2 Delivery of the ship to the recycling facility

8.2.1 At the end of a ship's operating life the shipowner is responsible for delivery of the ship to the recycling facility as described in the contract with the facility. In addition, the shipowner should provide the recycling facility with the ship's Green Passport and, if available, any technical advice from the shipbuilder or equipment supplier on dismantling as described in these Guidelines.

8.2.2 Shipowners should ensure that appropriate insurance is in place to cover response and liability in respect of the voyage of the ship to the recycling facility. Shipowners should also have in place contingency arrangements in the event that either the ship is unable to complete the voyage to the recycling facility (e.g. due to bad weather), or the recycling facility is unable to accept delivery of the ship (shutdown of operations, etc.).

8.2.3 The shipowner, having delivered a ship to a recycling facility, should inform the Administration accordingly in order to de-register the ship.

8.3 Preparation of a ship for recycling

8.3.1 General

8.3.1.1 The preparation of a ship for recycling should address occupational safety and health, environmental issues and the safe operation of the ship prior to and on its final voyage to the recycling facility. Conditions on the ship that may threaten worker safety at the recycling facility should, to the extent practicable, be identified by the shipowner, seeking assistance from other parties if required, and either be rectified or reported to the recycling facility to ensure that

appropriate safety precautions are taken. Ideally, a facility should be capable of recycling the whole ship in a responsible way.

8.3.1.2 With regard to potentially hazardous materials which cannot be safely removed and properly disposed of by the purchasing recycling facility, the shipowner should, consistent with the safe operation of the ship, either:

- .1 remove these materials from the ship elsewhere in a manner that is consistent with relevant national and international legislation and relevant guidelines; or
- .2 minimize these materials in amount and location and report to the recycling facility to ensure that suitable arrangements can be made for their reclamation, recycling or disposal.

8.3.1.3 The preparation of the ship for recycling is, to a large extent, dependent on the capabilities of the recycling facility and the requirements of the relevant national authority as referred to in section 8.1.1 of these Guidelines.

8.3.2 *Ship recycling plan*

8.3.2.1 The preparation of the ship for recycling should begin before the ship arrives at the recycling facility and the recycling facility should work with the shipowner before the delivery of the ship in determining the extent of pre-recycling work that is desirable.

8.3.2.2 The development and implementation of a recycling plan can help ensure that a ship has been prepared to the maximum extent possible prior to its recycling and that the safety of the ship, prior to delivery, has been taken into account. The plan should be developed by the recycling facility in consultation with the shipowner, taking into account the potential hazards which may arise during the recycling operation, the relevant national and international requirements and the facilities available at the relevant recycling facility in terms of materials, handling and the disposal of any wastes generated during the recycling process.

8.3.2.3 A major purpose of the plan is to ensure that wastes potentially contributing to pollution of the environment or potential hazards to worker health and safety, are properly identified and handled.

8.3.2.4 The recycling plan should take into account *inter alia*:

- .1 the Green Passport (section 5);
- .2 any technical advice from the shipbuilder;
- .3 details of the ship's operational equipment and potential sources, amounts and relative hazards of potential contaminants (including

chemical and biological) that may be released to the environment as indicated by the inventory; and

- .4 potential hazards to worker safety that may arise during the recycling operation.

8.3.2.5 Agreement to implement the recycling plan should be part of the contract between shipowner and facility.

8.3.2.6 Technical considerations to assist in developing the ship recycling plan include, but are not limited to, the following:

- .1 suggestions for planning work;
- .2 general notes on salvage;
- .3 ship stability during clean-up and transits;
- .4 tank cleaning;
- .5 cleaning compartments with bilges;
- .6 dealing with piping and fittings;
- .7 cleaning fitted machinery;
- .8 suggestions on handling waste.

8.3.3 *Preparations to prevent pollution*

8.3.3.1 The last owner of a ship sold for recycling should, consistent with the safe operation of the ship:

- .1 minimize the quantities of fuel, diesel, lubricating, hydraulic and other oils and chemicals on board at delivery to the facility;
- .2 if the facility is not equipped with reception facilities, remove wastes at the last port with reception facilities before delivery of the ship to the recycling facility;
- .3 ensure that the Green Passport is completed in accordance with section 5;
- .4 take measures to facilitate the controlled drainage, by the recycling facility, of potentially harmful liquids from the ship; and
- .5 take measures to ensure that the ship's ballast water is managed in accordance with the relevant international or national standards and requirements.

8.3.3.2 Among the items which may be considered by the shipowner in consultation with the recycling facility in accordance with paragraph 8.3.1 prior to recycling, consistent with the safe operation of the ship, are:

- .1 the removal and safe disposal of asbestos or, alternatively, the clear marking of any Asbestos Containing Materials (ACMs) or Presumed Asbestos Containing Materials (PACMs);
- .2 the discharge of halon to an approved facility and the use of portable and returnable fire-fighting equipment for the final voyage to the recycling site;
- .3 the removal of materials remaining in tanks or piping, to the maximum extent possible (including fuel, lubricating oils, hydraulic fluids, cargoes and their residues, and grease). Drummed, tanked, or canned liquids or gaseous materials should be removed from the ship. All materials removed should be managed in an environmentally sound manner (e.g., recycling and, in certain cases, onshore incineration);
- .4 the removal of equipment containing liquid PCBs;
- .5 the identification of capacitors and transformers containing dielectric fluid;
- .6 the removal of residues from parts of the ship used for storage of fuel or chemical stocks such as tanks (these areas should be flushed and cleaned);
- .7 the provision of advice on the nature of any hazardous materials on board, as in the inventory of potential hazardous materials; and
- .8 the clear marking of other potentially hazardous materials and spaces on board the ship.

8.3.4 *Preparations to protect occupational health and safety*

8.3.4.1 Prior to recycling, the shipowner should, in accordance with paragraph 8.3.1 and consistent with the safe operation of the ship:

- .1 in connection with the delivery of a ship, provide or arrange for a gas-free certificate or hot work safe certification as applicable, issued by a relevant and appropriate body, for enclosed spaces on board ship (It should be recognized that any such certification is valid only at the time it is issued and that such certification should not discourage the ship recycling facility from conducting their own inspections of such areas);
- .2 ensure that any compartments on the ship which may contain an oxygen-deficient atmosphere are clearly marked as such, and that the facility is duly notified of these and other hazardous enclosed spaces. (This should not preclude or discourage recycling facilities from conducting similar inspections);