

Risk Focus: Inventory of Hazardous Materials (IHM)

A guide for shipowners to ensure compliance with
ship recycling legislation



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A guide to help ensure your IHM is compliant

The advent of international and regional legislation is driving the marine industry towards achieving compliance, at all stages of a ship's life.

Background

For the last 30 years or so, ship recycling – also known as ship breaking, dismantling, scrapping, and other terms – has been centred primarily in India, Bangladesh and Pakistan, where the vast majority of ships are broken at 'beaching' facilities. Along with China, where the 'alongside' method of ship recycling is preferred and Turkey, which uses the 'landing' method, these 5 main countries account for more than 95% of annual ship recycling volume.

Ship recycling can and should be a safe and environmentally sound industry. It employs a large workforce in South Asia where almost nothing is wasted during the dismantling and recycling process. However, working practices found at the majority of the world's ship recycling facilities have routinely fallen short of internationally acceptable standards, with environmental concerns and frequent loss of life reported by pressure groups and, over recent years, mainstream media.

Cutting apart very large steel structures is a complex business. Although a high proportion of the ship structure provides a ready supply of steel and other metals there are also significant amounts of plastics and other materials that must be handled carefully and appropriately. Hazardous materials such as asbestos are a constant concern. The traditional beaching methods commonly used during dismantling make it difficult to ensure worker safety and containment of pollutants.

The Green Passport

In a bid to help ensure that workers breaking ships were forewarned of potential or known hazardous materials inherent in the ship's structure or fixed equipment, the International Maritime Organization (IMO) introduced the concept of an Inventory of Hazardous Materials – then known as a Green Passport – as part of their voluntary *Guidelines on Ship Recycling (2003)*.

The guidelines provided advice to all stakeholders in the recycling process, including administrations of ship building and maritime equipment supplying countries, flag, port and recycling States, and commercial bodies such as shipowners, ship builders, and recycling yards.

The guidelines noted 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. Furthermore, new steel production from recycled steel requires only one third of the energy used for steel production from raw materials. Recycling thus makes a positive contribution to the global conservation of energy and resources and, in the process, employs a large, if predominantly unskilled, workforce¹.

It was envisaged that the Green Passport would be produced by the shipyard at construction stage and successive owners of the ship would maintain its accuracy throughout the ship's working life. The Green Passport would then be delivered with the ship to the recycling facility, providing information on the potentially hazardous materials on board.



¹ <http://www.imo.org/en/OurWork/Environment/ShipRecycling/Pages/Default.aspx>

The Inventory of Hazardous Materials (IHM)

Over the last decade international and regional ship recycling legislation has been adopted, some of which is already in force. The cornerstone of this legislation is the IHM, which is based on the same concept as the Green Passport but with two key differences:

Firstly, compiling and maintaining an Inventory of Hazardous Materials is no longer a voluntary requirement, but is mandatory for all ships over 500GT.

Secondly, and crucially, the IHM is expected to be significantly more accurate than the old Green Passport with sampling of unknown hazardous materials expected as standard.

This guide aims to explain the key concepts, processes, and requirements of the IHM, based upon guidance materials, experience and best practice.

There are 2 key pieces of ship recycling legislation that need to be considered when compiling an IHM.

IMO Hong Kong Convention²

The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (the "Convention") is aimed at ensuring that, when being recycled at the end of their operational lives, ships over 500GT do not pose any unnecessary risks to human health, safety and the environment.

The Convention was adopted in 2009 but – at the time of writing – is yet to enter into force. Entry into force requirements are widely expected to be met during 2020/2021.

Based upon the 2003 voluntary guidelines, regulations in the Convention cover: the design, construction, operation and preparation of ships to facilitate safe and environmentally sound recycling without compromising the safety and operational efficiency of ships; the operation of ship recycling facilities in a safe and environmentally sound manner; and the establishment of an enforcement mechanism for ship recycling, including certification and reporting requirements.

A key requirement of the Convention is for ships over 500GT to maintain an IHM during operation, in accordance with published

MEPC Guidelines for the Development of the Inventory of Hazardous Materials³.

Furthermore, once ratified, ship recycling facilities will be expected to prepare a Ship Recycling Facility Plan and national authorities will be required to take measures to ensure that facilities under their jurisdiction comply with the Convention.

European Union Ship Recycling Regulation⁴

The EU Regulation entered into force in December 2013. It applies to ships of at least 500GT flying the flag of an EU member state, and to ships visiting the EU flying the flag of a non-EU member state.

The EU Regulation is mostly aligned with the IMO Convention and, by 31 December 2020, all ships entering EU waters – regardless of flag – will be expected to maintain an IHM (see Figure 1). The IHM lists 2 additional hazardous materials that need to be addressed in addition to the IMO requirements.

The Regulation makes reference to the European Maritime Safety Agency's *Best Practice Guidance on the Development of the IHM* document⁵. It should be noted that the Introduction to this document states:

"EMSA's Best Practice Guidance is a non-binding document and nothing in this guidance document should be construed as generating mandatory requirements on any of the involved parties."

In addition to the IHM, the Regulation requires the establishment of a list of approved ship recycling facilities (the "EU List").

Ships flying the flag of an EU member state can only be recycled at a facility on the EU List. Such facilities are required to meet design, construction and operation requirements of the EU and can be located outside of the EU.

For facilities located in third countries (i.e. those located outside the EU) requirements and procedures for inclusion on the EU List were published by the EC in a Technical Guidance Note. By applying for inclusion on the EU List, facilities located in third countries accept that they will be subject to on-site inspections by the EC, or agents acting on its behalf.



Figure 1 EU Regulation Timeline.

² <http://www.basel.int/Portals/4/Basel%20Convention/docs/ships/HongKongConvention.pdf>

³ [http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/MEPC%20Resolutions/MEPC.269\(68\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/MEPC%20Resolutions/MEPC.269(68).pdf)

⁴ <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:330:0001:0020:EN:PDF>

⁵ <https://www.emsa.europa.eu/emsa-documents/latest/item/2874-emsa-s-best-practice-guidance-on-the-inventory-of-hazardous-materials.html>

Figure 2

| Table | Material name | | Inventory | | | Threshold value | |
|---|--------------------------------------|----------------------------------|-----------|---------|----------|----------------------|--------------------|
| | | | Part I | Part II | Part III | | |
| Table A (materials listed in appendix 1 of the Convention) | Asbestos | Asbestos | X | | | 0.1% | |
| | Polychlorinated biphenyls (PCBs) | Polychlorinated biphenyls (PCBs) | X | | | 50 mg/kg | |
| | Ozone Depleting Substance (ODS) | Chlorofluorocarbons (CFCs) | | X | | | No threshold value |
| | | Halons | | X | | | |
| | | Other fully halogenated CFCs | | X | | | |
| | | Carbon tetrachloride | | X | | | |
| | | 1, 1, 1-Trichloroethane | | X | | | |
| | | Hydrochlorofluorocarbons | | X | | | |
| | | Hydrobromofluorocarbons | | X | | | |
| | | Methyl bromide | | X | | | |
| | | Bromochloromethane | | X | | | |
| | | e.g. Tributyltin (TBT) | | X | | | |
| | e.g. Triphenyl tins (TPTs) | | X | | | 2500 mg total tin/kg | |
| e.g. Tributyltin oxide (TBTO) | | X | | | | | |
| EU SRR | Perfluorooctane sulfonic acid (PFOS) | | X | | | 10 mg/kg | |

| Table | Material name | | Inventory | | | Threshold value |
|---|---|--|-----------|---------|----------|--------------------|
| | | | Part I | Part II | Part III | |
| Table B (materials listed in appendix 2 of the Convention) | Cadmium and cadmium compounds | | X | | | 100 mg/kg |
| | Hexavalent chromium and hexavalent chromium compounds | | X | | | 1000 mg/kg |
| | Lead and lead compounds | | X | | | 1000 mg/kg |
| | Mercury and mercury compounds | | X | | | 1000 mg/kg |
| | Polybrominated biphenyl (PBBs) | | X | | | 50 mg/kg |
| | Polybrominated diphenyl ethers (PBDEs) | | X | | | 1000 mg/kg |
| | Polychloronaphthalenes (Cl >=3) | | X | | | 50 mg/kg |
| | Radioactive substances | | X | | | No threshold value |
| EU SRR | Certain shortchain chlorinated paraffins | | X | | | 1% |
| | Brominated flame retardant (HBCDD) | | X | | | 100 mg/kg |

What is in an IHM?

The Inventory consists of:

- Part I: Specific hazardous materials contained in ship structure or fixed equipment, as detailed in Tables A and B of the MEPC Guidelines Appendix 1, including additional EU Regulation hazardous materials as appropriate (see Figure 2).
- Part II: Operationally generated wastes, as detailed in Table C of the MEPC Guidelines (see Appendix)
- Part III: Stores, as detailed in Tables C and D of the MEPC Guidelines (see Appendix)

Part I of the IHM should be compiled at new build prior to the ship entering service or, for existing ships, during operation.

Parts II and III of the IHM are only to be compiled once a decision has been taken to recycle the ship.

Loosely fitted equipment, for example portable extinguishers, spare parts, non-fixed electrical and electronic equipment, lamps and filament bulbs, and non-ship specific furniture

(such as chairs, tables, beds, curtains, carpets, etc.) should be listed in Part III, and are not required to be listed in Part I.

Further, Table B materials inherent in solid metals or metal alloys, such as steels, aluminium, brasses, bronzes, plating and solders, provided they are used in general construction, such as hull, superstructure, pipes or housings for equipment and machinery, are not required to be listed in the Inventory.

Who is responsible for compiling the IHM?

For new builds, the shipbuilder is responsible for complying with the relevant international requirements on installing HM on board new-build ships. In this respect, the conformity of Part I of the Inventory at the design and construction stage should be ascertained by reference to Suppliers' Declarations of Conformity and related Material Declarations (MD) collected from suppliers. Further details follow.

Part I of the Inventory for existing ships should be developed by the shipowner.

As detailed in the IMO guidelines and the EMSA Best Practice Guidance, there are a number of key considerations that should be taken into account.



Key considerations

Definition of Ship

The Convention and the Regulation both define a 'ship' as:

- a vessel of any type whatsoever operating or having operated in the marine environment and includes submersibles, floating craft, floating platforms, self-elevating platforms, Floating Storage Units (FSUs), and Floating Production Storage and Offloading Units (FPSOs), including a vessel stripped of equipment or being towed.

As such, the requirement for an IHM is not just limited to marine assets; the offshore industry also needs to take note.

The Convention and the Regulation do not apply to warships, naval auxiliary or other ships owned or operated by a state and used only on government non-commercial service.

Hazardous Materials Experts

Inventories are not only essential for safe and environmentally sound recycling, but they provide benefits with respect to the maintenance and operation of a ship. The development of an IHM will not only help to ensure compliance with the Convention and the EU Regulation, but can also aid compliance with existing SOLAS, ISM Code and Safety Management System requirements⁶.

However, in order to ensure that the above benefits are realised, the services of IHM service providers should be called upon to offer help and advice, at any stage in the development of an IHM.

Although it is possible for shipowners to develop IHMs using their own resources, compiling an Inventory and taking of samples for any unknown items or materials in the ship's structure or fixed equipment is a complex process and one that should only be undertaken with expert guidance.

The IHM guidelines which accompany the Convention state that, for existing ships, the procedures for the development of the IHM "should be carried out by the shipowner, who may draw upon expert assistance."

The EMSA Best Practice Guidance goes further and recommends that for new builds expert assistance may also be sought by the ship builder. The Best Practice Guidance also provides further information on the expected knowledge, experience and qualifications that such an expert should possess, regardless of whether the IHM is being compiled at build or during operation:

- 'Individual IHM expert' is a person who has the appropriate training, qualifications and knowledge to conduct Hazardous Materials surveys for the development and maintenance of an IHM. He or she should have experience on ship structure and on handling of such materials and sufficient knowledge of how to compile an IHM and of all the relevant international and EU legislation

- 'IHM expert company' is an entity employing or contracting individual IHM experts to conduct any relevant work or task in relation to the IHM process for the purpose of compiling or updating Inventories

As demand for IHM compilation increases, so do the numbers of Hazardous Materials Experts offering services to shipowners. The major Classification Societies have implemented procedures for approval of such experts and are considered to be well-placed to offer further advice on the suitability of expert parties. Some Class Societies will only verify and subsequently certify an IHM if one of their preferred experts has compiled the Inventory.

Therefore, it is always worth checking with Class before proceeding with the development of an IHM.

Standard format of the Inventory

The Convention and the Regulation both refer to the same standard format for the IHM, and for the most part the structure and layout of the IHM is in accordance with the published format – regardless of which expert company compiles the Inventory or which Class Society subsequently verifies the information.

However, it should be noted that there is not a universally accepted electronic format and the various Expert Companies and Classification Societies involved in the process have different designs and/or software packages.

It is again recommended that Class is consulted prior to compiling an IHM, to ensure that they will accept the format of the Inventory.

Supplier Declaration of Conformity and Material Declarations

Information provided by suppliers of materials and equipment is considered to be key to the development and ongoing maintenance of the IHM.

The legislation requires that suppliers should make 'Declarations' regarding the presence of hazardous materials listed in Tables A and B if they exceed specified threshold values.

Standard formats for the Declarations are available in the IMO guidelines.

Concerns have been raised that such Declarations are frequently not made available, or are inaccurate, and this applies at new build stage and for existing ships (during compilation, or as part of ongoing maintenance of the Inventory).

The EMSA Best Practice Guidance provides advice on additional steps to be taken if there are any concerns about Declarations, as summarised overleaf.

⁶ <https://www.ics-shipping.org/docs/default-source/resources/environmental-protection/shipping-industry-guidelines-on-transitional-measures-for-shipowners-selling-ships-for-recycling.pdf?sfvrsn=8>



IHM Part I – requirements for new ships

Part I of the Inventory for new ships should be developed at the design and construction stage. As much information as possible should be obtained, throughout the build process.

Reference should be made to the IMO guidelines for the development process, which is based on three main steps:

1. Collection of hazardous material information, based upon information provided by suppliers
2. Assessment of the collected information, including identification of all systems/products which contain hazardous materials above applicable threshold values
3. Preparation of the IHM, using the standard format

The collection of the hazardous materials information is therefore expected to involve the entire shipbuilding supply chain, as shown in Figure 3.

It should be noted that the non-legally binding EMSA Best Practice Guidelines state the following:

"However, in practice, there were cases where random sampling checking proved that [Material Declarations] were not accurate. Therefore, the shipbuilder should establish a quality assurance policy for performing random checking of materials provided by the suppliers... The checking of the materials may include visual checking and/or random samples which will be tested by indicative or field testing and/or random samples to be tested by specific testing... The entity carrying out the [hazardous materials] survey and sampling should be an IHM expert as defined in this guidance document working under the conditions described in this guidance document. The shipowner may also establish a policy for performing random checking of materials for new ships. In this context, the same process as for carrying out random checking by the shipbuilder may be applied."

It is recommended that Class and/or Flag is consulted to ascertain if they have specific policies or procedures that insist upon the EMSA Best Practice Guidance being followed.

IHM Part I – requirements for existing ships

Part I of the Inventory for existing ships should be developed by the shipowner, with reference made to the IMO guidelines' examples, which are based on five main steps.

It is recommended that, when possible, IHM compilation takes place during drydock and that the shipowner draws upon expert assistance by contracting a suitably qualified Hazardous Materials Expert Company to assist with all five steps:

1. Collection of information, including but not limited to:
 - a. maintenance, conversion and repair documents
 - b. certificates, manuals, ship's plans, drawings and technical specifications
 - c. data sheets and Material Declarations
 - d. hazardous material inventories or recycling information from sister ships
 - e. information sourced from previous shipowners, the ship builder, historical societies, classification society records

and ship recycling facilities with experience working with similar ships

2. Assessment of the collected information, to cover all Table A materials, with Table B assessed "as far as practicable". The results of the assessment should be reflected in the visual/sampling check plan.
3. Preparation of a Visual/Sampling Check Plan (VSCP) based on the following lists of equipment, systems and/or areas:
 - a. Visual checks – for materials confirmed by document analysis
 - b. Sampling checks – for materials that can not be confirmed by document analysis and/or visual checks
 - c. Those classed as 'potentially containing hazardous material' – materials that can not be confirmed by document analysis, visual checks, and/or sampling checks

Note: The classification 'potentially containing' should only be used if a comprehensible justification – such as the impossibility of conducting sampling without compromising the safety of the ship and its operational efficiency – can be provided. This classification is not recommended as there seems to be little value in compiling an IHM that states the ship's structure or fixed equipment potentially contains hazardous materials; it could be seen to create more questions than answers. Limited, targeted sampling is strongly recommended.

4. Onboard visual/sampling check, with sample points clearly marked on the ship plan, supported by photographs, with sample results clearly referenced.

Samples may be tested by a variety of methods, including indicative or field tests. However, it is recommended, in order to avoid dispute, that "specific testing" should be used. These tests are repeatable, reliable and can demonstrate definitively whether a known type of a hazard exists or not. Specific tests are to be carried out by a suitably accredited laboratory, working to international standards or equivalent, with a written report provided.

IHM Expert Companies and Classification Societies are well-placed to offer further advice on sampling, and associated costs.

5. Preparation of Part I of the IHM and supporting documentation, using the standard format.

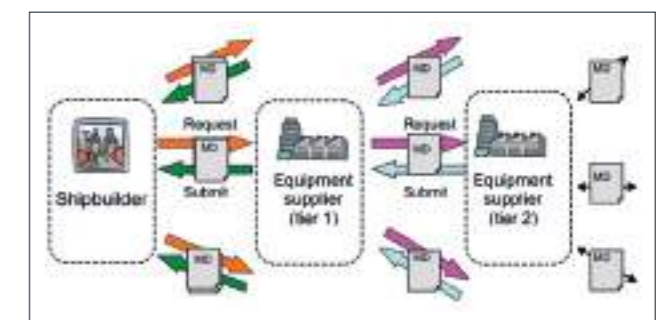


Figure 3 Supply chain involvement, based upon Appendix 3 Figure 1 of the IMO guidelines.

Source: [http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/MEPC%20Resolutions/MEPC.269\(68\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/MEPC%20Resolutions/MEPC.269(68).pdf)

Certification and Surveys

Once the IHM has been compiled, ships shall be subject to the following surveys:

- initial
- renewal
- additional
- final

Initial and renewal surveys must verify that the IHM Part I complies with the requirements of the Convention and/or the EU Regulation. They should take place prior to the issuance of the relevant Certificate or Statement of Compliance or, for new ships, prior to entering into service.

Additional surveys may be made at the request of the shipowner "after a change, replacement, or significant repair of the structure, equipment, systems, fittings, arrangements and material" which has an impact on the IHM, to ensure that the ship continues to comply with the requirements of the Regulation, and that Part I of the IHM is amended as necessary. It is recommended that Class, or whoever issues the certification, is consulted as to whether an additional survey is required, considering that interpretations of the term 'significant' are likely to vary.

The Final Survey must verify that the IHM (Parts I, II and III) and the Ship Recycling Plan comply with the requirements of the Convention and/or the Regulation, and that the ship recycling facility where the ship is to be recycled is authorised as appropriate.

Ongoing maintenance of the IHM

Regardless of whether the Inventory is compiled, verified and certified at new build or during operation, one of the most crucial requirements of the legislation is the life-cycle management of the IHM. Without proper maintenance of the Inventory, all the good work during the initial compilation process can be undone and confidence in the contents of the IHM will be lost.

Shipowners should establish procedures on board the ship and within their company to ensure each IHM is maintained and updated throughout the operational life of the ship, reflecting new installations containing any Tables A and B hazardous materials, including additional EU Regulation materials (as appropriate) and relevant changes in the structure and equipment of the ship.

To this end, a designated IHM responsible person should be identified and a management system should be established by the shipowner including specific provisions to safeguard the quality and continuity of the IHM when building, buying or selling a ship, or when changing the ship's registry. The quality management system should identify the procedures to safeguard the proper updating of the IHM during scheduled or unscheduled works involving changes, replacements or repairs to the structure, equipment, systems, fittings, arrangements and material, which has an impact on the Inventory.

It is recommended that the Inventory, provided by the shipbuilder or IHM Expert Company, is in an electronic and editable format to assist with the ongoing maintenance.

Known Port State Control enforcement mechanisms

Both the Convention and the EU Regulation provide for the control of ships.

Once the Convention has entered into force and the requirement for an IHM applies, it is expected that Port State Control verification of the IHM will be limited to checking that a valid International Certificate on Inventory of Hazardous Materials is kept on board.

For the EU Regulation, the IHM application date of 31 December 2020 applies. From that date, when a ship calls at a port or anchorage of a Member State, it is expected that Port State Control verification of the IHM will be limited to checking that an Inventory Certificate (for EU flagged ships) or Statement of Compliance (for non-EU flagged ships) is kept on board; if the certification is valid this shall be considered sufficient for the inspection to be approved.

A key concept is 'validity'. Normally, regions publish their requirements for inspection to check validity, such as the Paris or Tokyo Memorandum of Understanding. These specific requirements for IHM do not exist yet. In September 2019, EMSA published *Guidance on Inspections of Ships by the port States*⁷, but it is unclear and appears it may rely on the PSC inspector using an external expert company to check the Inventory.

At this stage it is not certain what provisions will be made if no certificate or if an invalid certificate is found on board, or any other clear ground revealed. The EMSA Best Practice Guidance states that a Port State Control Officer should either undertake a detailed inspection or should ask the relevant authority of the Member State to carry out a detailed inspection in accordance with the SRR, as appropriate.

Requirements for end-of-life ships

Once a decision to recycle a ship has been taken there are some additional requirements for a shipowner to consider, some of which involve working in partnership with an authorised recycling facility.

In brief, ships destined to be recycled shall:

- only be recycled at Ship Recycling Facilities that are authorized in accordance with the Convention or, in the case of EU-flagged ships, are published on the EU List
- only be recycled at facilities fully authorized to handle the materials identified in the IHM
- conduct operations in the period prior to entering the Ship Recycling Facility in order to minimize the amount of cargo residues, remaining fuel oil, and wastes remaining on board
- in the case of a tanker, arrive at the Ship Recycling Facility with cargo tanks and pump room(s) in a condition that is ready for certification as Safe-for-entry, or Safe-for-hot work, or both, according to national laws, regulations and policies of

the Party under whose jurisdiction the Ship Recycling Facility operates

- provide to the Ship Recycling Facility all available information relating to the ship for the development of the Ship Recycling Plan required by the Convention and/or Regulation
- complete Parts I, II and III of the IHM; and
- be certified as Ready for Recycling by the Administration or organization recognized by it.

IHM Parts II and III

As such, once a decision has been made to recycle the ship, the shipowner will need to complete Part II (operationally generated wastes) and Part III (stores) of the IHM, and incorporate this information into the properly maintained and updated Part I. This will then need to be verified, typically as part of the Final Survey.

Compiling Parts II and III of the IHM is typically a much simpler process than that required for the development of Part I. Expert support is not usually required, and there is no requirement for sampling to take place. Rather, it is an administrative process of ensuring that items listed in Tables C and D of the MEPC Guidelines are identified and recorded.

That said, many IHM Expert Companies offer this service and can provide further advice.

Ship Recycling Plan

In turn, the information provided by the shipowner in Parts I, II and III of the IHM – along with other documents specified in the relevant IMO guidelines⁸ – should be used by an authorised ship recycling facility to help develop a ship-specific Ship Recycling Plan (SRP).

The SRP should be developed in accordance with the aforementioned guidelines and should include information concerning the establishment, maintenance, and monitoring of

Safe-for-entry and Safe-for-hot work conditions and how the type and amount of materials – including those identified in the Inventory of Hazardous Materials – will be managed.

The SRP will be tacitly or explicitly approved by the Competent Authority authorizing the ship recycling facility. To date, most of the member states who have ratified the Convention appear to prefer tacit approval. Although this removes a possible delay, it does mean that a potential governmental safeguard is not available to the Owner to allay the risks in the country of the ship recycling facility.

Final Survey

Once the above end-of-life requirements have been met, a Final Survey prior to the ship being taken out of service and before the recycling of the ship has started will be required.

This survey shall verify:

1. That Parts I, II and III of the IHM is in accordance with the requirements of the Convention and/or EU Regulation
2. That the SRP properly reflects the information contained in the IHM and contains information concerning the establishment, maintenance and monitoring of Safe-for-entry and Safe-for-hot work conditions
3. That the Ship Recycling Facility(ies) where the ship is to be recycled holds a valid authorization in accordance with the Convention or, for EU-flagged ships, is on the EU List.

Some Classification Societies are already offering Final Survey services ahead of the Convention entering into force, but it should be noted that experience is currently limited, and evidence of how end-of-life requirements are to be completed satisfactorily – by all parties concerned and for all ships going for recycling – is not available.



⁷ <http://www.emsa.europa.eu/emsa-documents/latest/item/3721-guidance-on-inspections-of-ships-by-the-port-states-in-accordance-with-regulation-eu-1257-2013-on-ship-recycling.html>

⁸ <http://www.imo.org/en/OurWork/Environment/ShipRecycling/Pages/Default.aspx>



Case Study – how compliance can reduce risk and increase competitive edge

Vessel: A 1984-built product tanker, converted to an FPSO in 1997, working in the North Sea, UK flag.

Although reported in the media that the ship was available for redeployment or conversion, a decision was taken to sell the ship to a cash buyer for scrap.

The ship transferred to a grey or black-listed flag, and authorities were not informed of the decision to go direct for scrapping in a non-OECD country, as the UK would have had to refuse export. Contrary to media reports the ship arrived on a beach in South Asia.

Furthermore, the ship had not compiled a Convention or Regulation compliant Inventory of Hazardous Materials, which would have alerted the authorities to the issue of radio-active substances. This is a well-known issue with vessels that trade in certain areas such as the North Sea, due to naturally occurring radioactive materials. These can accumulate in sludge or contaminate surfaces. If IHM guidelines were followed, this would have been easy to find, plan and manage. As would the issue of asbestos and other hazardous material likely to be inherent in the structure and fixed equipment of a ship built in the mid-1980s.

So far, a fairly normal example of probable legislative avoidance.

What happened next was not expected.

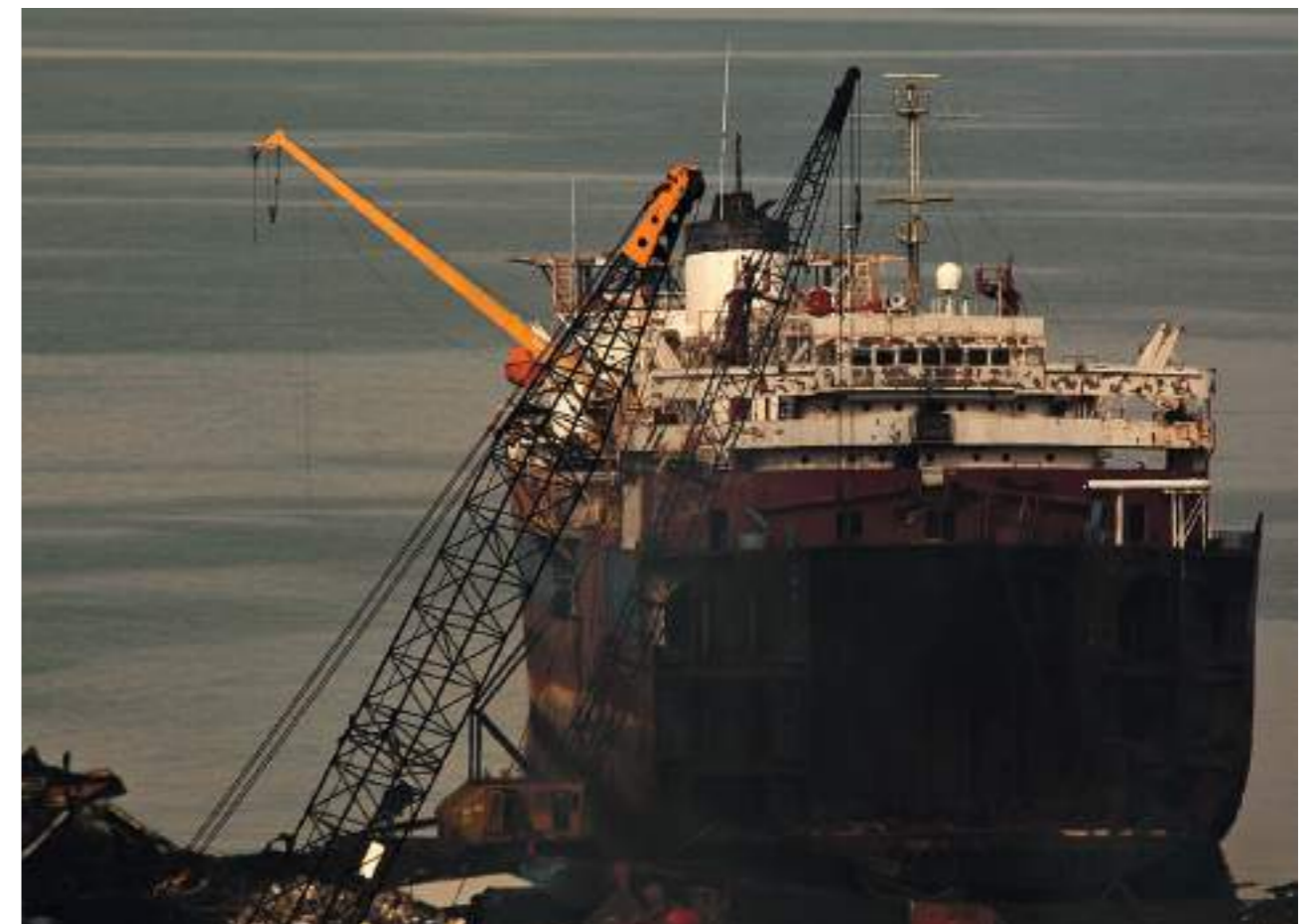
The case was brought to the attention of the Bangladesh Courts via a Public Interest Litigation (PIL) filed by the Bangladesh Environmental Lawyers Association (BELA) – a member of the NGO Shipbreaking Platform – often thought of as the ‘Greenpeace’ of the ship recycling world.

An injunction to stop the scrapping of the vessel was issued in August 2017, and in November 2019, the High Court Division of the Supreme Court of Bangladesh effectively ruled that the import and breaking of the ship was in fact a case of illegal dumping of radioactive waste.

This led to financial and reputational implications for the shipowner, the cash buyer, the recycling facility, and all those associated with the project.

All these issues can be avoided when applicable legislation and guidance documents are followed, even ahead of the Hong Kong Convention entering into force:

- Specified hazardous materials onboard can be assessed by experts and an IHM Part I compiled, and certified by Class
- A Final Survey can be held to verify that the IHM (Parts I, II and III) and the Ship Recycling Plan comply with relevant legislation, and that the Ship Recycling Facility:
 - holds a Hong Kong Convention statement of compliance (ahead of the Convention entering into force); or
 - is authorised by national authorities (once the Convention has entered into force); or
 - is on the European List (for EU-flagged ships)



APPENDIX

Table C - Potentially hazardous items

| No. | Properties | | Goods | Inventory | | |
|------|--|----------------------------------|---|-----------|---------|----------|
| | | | | Part I | Part II | Part III |
| C-1 | Liquid | Oiliness | Kerosene | | | X |
| C-2 | | | White spirit | | | X |
| C-3 | | | Lubricating oil | | | X |
| C-4 | | | Hydraulic oil | | | X |
| C-5 | | | Anti-seize compounds | | | X |
| C-6 | | | Fuel additive | | | X |
| C-7 | | | Engine coolant additives | | | X |
| C-8 | | | Antifreeze fluids | | | X |
| C-9 | | | Boiler and feed water treatment and test re-agents | | | X |
| C-10 | | | De-ioniser regenerating chemicals | | | X |
| C-11 | | | Evaporator dosing and descaling acids | | | X |
| C-12 | | | Paint stabilizers/rust stabilizers | | | X |
| C-13 | | | Solvents/thinners | | | X |
| C-14 | | | Paints | | | X |
| C-15 | | | Chemical refrigerants | | | X |
| C-16 | | | Battery electrolyte | | | X |
| C-17 | | | Alcohol, methylated spirits | | | X |
| C-18 | Gas | Explosives/ inflammables | Acetylene | | | X |
| C-19 | | | Propane | | | X |
| C-20 | | | Butane | | | X |
| C-21 | | | Oxygen | | | X |
| C-22 | | Green House Gases | CO ₂ | | | X |
| C-23 | | | Perfluorocarbons (PFCs) | | | X |
| C-24 | | | Methane | | | X |
| C-25 | | | Hydrofluorocarbon (HFCs) | | | X |
| C-27 | Nitrous oxide (N ₂ O) | | | X | | |
| C-28 | Sulfur hexafluoride (SF ₆) | | | X | | |
| C-29 | Liquid | Oiliness | Bunkers: fuel oil | | | X |
| C-30 | | | Grease | | | X |
| C-31 | | | Waste oil (sludge) | | X | |
| C-32 | | | Bilge and/or waste water generated by the after-treatment systems fitted on machineries | | X | |
| C-33 | | | Oily liquid cargo tank residues | | X | |
| C-34 | | | Ballast water | | X | |
| C-35 | | | Raw sewage | | X | |
| C-36 | | | Treated sewage | | X | |
| C-37 | | | Non-oily liquid cargo residues | | X | |
| C-38 | Gas | Explosibility/ inflammability | Fuel gas | | | X |

| No. | Properties | Goods | Inventory | | |
|------|------------|---|-----------|---------|----------|
| | | | Part I | Part II | Part III |
| C-39 | Solid | Dry cargo residues | | X | |
| C-40 | | Medical waste/infectious waste | | X | |
| C-41 | | Incinerator ash | | X | |
| C-42 | | Garbage | | X | |
| C-43 | | Fuel tank residues | | X | |
| C-44 | | Oily solid cargo tank residues | | X | |
| C-45 | | Oily or chemical contaminated rags | | X | |
| C-46 | | Batteries (incl. lead acid batteries) | | | X |
| C-47 | | Pesticides/insecticide sprays | | | X |
| C-48 | | Extinguishers | | | X |
| C-49 | | Chemical cleaner (incl. electrical equipment cleaner, carbon remover) | | | X |
| C-50 | | Detergent/bleacher (could be a liquid) | | | X |
| C-51 | | Miscellaneous medicines | | | X |
| C-52 | | Fire fighting clothing and Personal protective equipment | | | X |
| C-53 | | Dry tank residues | | X | |
| C-54 | | Cargo residues | | X | |
| C-55 | | Spare parts which contain materials listed in Table A or Table B | | | X |

Table D – Regular consumable goods potentially containing hazardous materials

| No. | Properties | Example | Inventory | | |
|-----|---|--|-----------|---------|----------|
| | | | Part I | Part II | Part III |
| D-1 | Electrical and electronic equipment | Computers, refrigerators, printers, scanners, television sets, radio sets, video cameras, video recorders, telephones, consumer batteries, fluorescent lamps, filament bulbs, lamps | | | X |
| D-2 | Lighting equipment | Fluorescent lamps, filament bulbs, lamps | | | X |
| D-3 | Non ship-specific furniture, interior and similar equipment | Chairs, sofas, tables, beds, curtains, carpets, garbage bins, bed-linen, pillows, towels, mattresses, storage racks, decoration, bathroom installations, toys, not structurally relevant or integrated artwork | | | X |

Source: IMO RESOLUTION MEPC.269(68)
 Adopted on 15 May 2015
 2015 GUIDELINES FOR THE DEVELOPMENT OF THE INVENTORY OF HAZARDOUS MATERIALS
[http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/MEPC%20Resolutions/MEPC.269\(68\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/MEPC%20Resolutions/MEPC.269(68).pdf)



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Marprof Environmental was formed in 2018. With combined marine consultancy experience amounting to almost half a century, the founding partners specialise in ship recycling legislation and providing solutions – for shipbuilders, shipowners, recycling facilities, flag states, and the legislators themselves. Marprof's practical experience includes leading on asbestos related projects, IHM certification through to Ship Recycling Facility audits and certifications and includes active participation at the IMO and the EU contributing to ship recycling legislation and guidance materials.

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