

Viewpoint

Ship recycling and marine pollution

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Abstract

This paper discusses the historical background, structure and enforcement of the ‘2009 Hong Kong International Convention on the Safe and Environmentally Sound Recycling of Ships.’ the 2009 Hong Kong Convention establishes control and enforcement instruments related to ship recycling, determining the control rights of Port States and the obligations of Flag States, Parties and recycling facilities under its jurisdiction. The Convention also controls the communication and exchange of information procedures, establishes a reporting system to be used upon the completion of recycling, and outlines an auditing system for detecting violations. The Convention, however, also contains some deficiencies. This paper concludes these deficiencies will eventually influence the final acceptance of this Convention by the international community.

 **Keywords:** Ship recycling; Marine environmental protection; International Maritime Organization

Article Outline

- 1. [Introduction](#)
- 2. [The historical background, structure and enforcement of the 2009 Hong Kong Convention](#)
 -
 - 2.1. [The historical background](#)
 - 2.2. [The structure of the 2009 Hong Kong Convention](#)
 - 2.3. [The enforcement of the 2009 Hong Kong Convention](#)
- 3. [The impact of the 2009 Hong Kong Convention on ocean law and policy](#)
 -
 - 3.1. [The current capacity of the world merchant marine fleet](#)
- 4. [The future impact and prospects of the 2009 Hong Kong Convention on ocean law and policy](#)
 -
 - 4.1. [Deficiencies arising from the 2009 Hong Kong Convention](#)
- 5. [Concluding remarks](#)
- [Acknowledgements](#)

- [References](#)

1. Introduction

The disposal of ships at end of their economic life has great significance for the continual renewal of the merchant marine fleet ([White and Molloy, 2001](#)) and for sustainable development ([Sundelin, 2008](#)). Ship-recycling facilities, however, also have negative effects in terms of the environment and occupational health and safety. Approximately 90–95% of international commercial goods are transported by sea because of cost efficiency. Shipping is an international activity because ships sail throughout the world, and it is the most important link in the world manufacturers' global logistical chain. Thus, the shipping industry represents the smallest part of a product's cost, making the trade viable.

Nonetheless, the shipping industry has a potentially negative impact on the marine environment and some economic disadvantages. In addition, if there is no appropriate integrated system for the recycling or reusing of ship-related steel, machines, auxiliaries and even furnishings, such materials will remain unused and useless to the economy at the end of a ship's life cycle. In this respect, ship-recycling facilities contribute to sustainable development and represent an environmentally friendly way to dispose of ships ([Mikelis, 2006](#)) and to economically integrate their life chains. Ship recycling costs are comparatively higher in the European Union (EU) and the United States of America (USA) than in Asia because of the strict regulations relating to environmental issues and occupational safety and health issues. Thus, ship-recycling facilities in the EU and the USA are not economically viable.

At the end of a ship's life cycle, the ship contains not only various recyclable materials but also a range of hazardous and toxic substances ([Krause, 2005](#)). In Europe and in Member States of the Organisation for Economic Co-operation and Development (OECD), materials that contain hazardous and toxic substances are subject to monitoring, and their disposal is strictly regulated. Most of those substances in ships are defined as hazardous and toxic under the existing 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989 Basel Convention).

The reality is that, currently, the global shipping industry relies on developing countries to dispose of decommissioned ships through the process of ship recycling. As a result, the ship-recycling industry avoids the burden of complying with the high cost standards in developed countries in order to manage the hazardous wastes involved in decommissioning. Subsequently, occupational safety and health issues emerge—particularly in association with the dismantling of beached ships in India, Bangladesh and Pakistan ([Rousmaniere, 2007](#)).

Ship-recycling workers live under the constant threat of occupational accidents due to the inherent risks of ship dismantling. In the above-mentioned countries, most of the workers do not wear protective equipment such as helmets, masks or goggles, and there are no warning signs of danger. Most of the workers have no occupational training in working with blowtorches or with the hazardous substances involved in ship recycling. Furthermore, many workers do not wear safety goggles to protect their eyes from the sparks. The paint and coatings cladding the ship's hull may be flammable and/or may contain toxic ingredients such as polychlorinated biphenyls (PCBs), heavy metals and pesticides such as tributyl tin (TBT) ([La Fayette, 2000](#)). Toxic fumes are released during the blowtorch-cutting process and afterwards while the paint and coatings may continue to smolder. The workers who use

cutting torches routinely inhale the toxic fumes from, for example, the steel coated with toxic paints.

The rise of environmentalism has influenced the development of policies in developed countries and international organizations, particularly the International Maritime Organization (IMO), the United Nations dedicated legislator of the global shipping industry since the catastrophic maritime catastrophes that took place in the 1960s ([Hadjistassou, 2004](#)). The IMO has been challenged with establishing a globally applicable and comprehensive maritime environmental legal system to achieve the goal of sustainable development. Taking into consideration shipping activities and sustainable development, the maritime environmental legal system covers the following periods:

- – the ship-construction period,
- – the operation and utilization period of the ship for any maritime purpose at sea and
- – the ship-recycling² period.

In the first instance, the IMO aims to develop goal-based construction standards for new ships, which were introduced by the 89th session of the council in November 2002. The recommendations on ‘goal-based ship-construction standards’ indicate that the IMO should develop initial ship-construction standards that permit innovation in design but ensure that ships are constructed to a suitable standard and, if properly maintained, will remain safe for their entire economic life. In addition, the standards should also ensure that all parts of a ship can be easily accessed to permit proper inspections and maintenance. With regard to these considerations, the IMO Assembly adopted the strategic plan for 2004–2010 and Resolution A.944 (23), which restated that, “the IMO would establish goal-based standards for the design and construction of new ships.”

Subsequently, the IMO, taking into consideration ship-operating periods, adopted international legal instruments that aimed to challenge vessel-sourced marine pollution. The documents, which were adopted by the IMO, comprise a broad range of marine pollution-related issues, including the prevention of pollution by oil, the carriage of chemicals by ships, the prevention of pollution by harmful substances carried by sea in packaged form, the prevention of pollution by sewage, the prevention of pollution by garbage, the prevention of air pollution and the prevention of marine pollution through the dumping of waste.

Although the IMO aims to establish a global maritime environmental legal system, legal actions relating to the ship-recycling period are still in their infancy compared to the laws governing the ship-construction and ship-operation periods. The environmental impact of ship-recycling facilities has been a topic of concern since the 1980s. The first noteworthy attempt to consider ship-recycling facilities was the 1989 Basel Convention. However, the 1989 Basel Convention was not entirely adequate to challenge all risks and problems arising from ship-recycling facilities. The 1989 Basel Convention briefly mentions the transportation of hazardous materials; however, it does not indicate detailed rules for the recycling process. With regard to these considerations, the IMO took ship recycling and its environmental impact onto its agenda. Since 2003, the IMO has adopted the Guidelines and Circulars for the purpose of achieving a green ship-recycling industry. In addition, joint efforts with the IMO,

the International Labour Organization (ILO) and the Conference of Parties to the 1989 Basel Convention were also made to establish a Joint Working Group on Ship Scrapping. Finally, in May 2009, the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships was adopted, which was aimed at ensuring that ships, when recycled after reaching the end of their operational lives, do not pose any unnecessary risk to human health and safety or to the environment.

2. The historical background, structure and enforcement of the 2009 Hong Kong Convention

2.1. The historical background

Taking into consideration environmental issues, ship-recycling facilities and their consequences were first brought to the IMO Marine Environment Protection Committee (MEPC) at its 42nd session (MEPC 42) in 1998. Since then, the Committee has agreed that the IMO has a dominant role to play in regulating ship-recycling facilities. The IMO's role includes technical and legal aspects, such as the preparation of a ship before recycling commences and coordination with the ILO and the 1989 Basel Convention during the recycling period. At the MEPC 47 session, the Committee agreed that the IMO should develop recommendatory guidelines to be adopted by an Assembly Resolution.

The MEPC 49 conducted the 'IMO Guidelines on Ship Recycling', which were adopted at the 23rd regular session of the Assembly by Resolution A.962 (23) on December 5, 2003. The above-mentioned Guidelines include the identification of potentially hazardous materials, procedures for new ships relating to ship recycling, procedures for existing ships relating to ship recycling, preparations for ship recycling, the role of stakeholders and other bodies and technical-cooperation issues.

It was agreed in the MEPC 53 that the IMO should develop a new mandatory system related to ship-recycling activities. The system should aim to establish legally binding and globally applicable regulations for ship-recycling facilities. With regard to these considerations, the 24th regular session of the IMO Assembly adopted Resolution A.981 (24) termed, 'New Legally Binding Instrument on Ship Recycling.' In accordance with the Resolution, the MEPC was required to develop a ship-recycling system, which provides the regulations for the following aspects of ship recycling:

- - 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 appropriate enforcement mechanism for ship recycling.

In addition to these regulations, the Resolution requires the MEPC to continue cooperating with the ILO and the appropriate bodies of the 1989 Basel Convention in this field with the aim of avoiding redundancy and the overlapping of responsibilities and competencies among

the three organizations. Furthermore, the Resolution urges governments and all involved stakeholders to apply the IMO Guidelines on ship recycling without delay.

At its 54th session, the MEPC convened a working group on ship-recycling facilities that discussed the issues and further developed a draft text that included Articles and an Annex with regulations for the safe and environmentally sound recycling of ships, including requirements for ships, ship-recycling facilities and reporting. The MEPC also considered the report of the second session of the Joint International Labour Organization/International Maritime Organization: the 1989 Basel Convention Working Group on Ship Scrapping, which met in December 2005. The views of the group were taken into consideration by the MEPC Working Group on Ship Recycling.

At its 55th session in October 2006, the MEPC Working Group on Ship Recycling further developed the text of the draft Convention, providing globally applicable ship-recycling regulations for international shipping and for recycling activities, and it agreed to request the IMO Council, at its 98th session, to consider the provision of a five-day conference during the 2008–2009 biennium to adopt it.

Finally, the new Convention, ‘the 2009 Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships,’ was born at a diplomatic conference held in Hong Kong, China, from May 11–15, 2009, which was attended by delegates from 63 countries.

2.2. The structure of the 2009 Hong Kong Convention

During the meetings of the IMO to establish the new ship-recycling system, it was agreed that the system should include regulations for the design (for new ships), construction, operation and preparation of ships (for new and existing ships) to facilitate safe and environmentally sound recycling without compromising safety and operational efficiency. It is also important to consider regulations for the operation of ship-recycling facilities in a safe and environmentally sound manner. Regulations for the establishment of an appropriate enforcement mechanism for ship recycling were also taken into account.

The 2009 Hong Kong Convention includes 21 Articles that cover the general obligations of Member States, definitions related to the ship-recycling process, application of the Convention, controls related to ship recycling, the survey and certification of ships, the authorization of ship-recycling facilities, the exchange of information among the Member States, the inspection of ships that are subjected to the recycling process, the detection of violations, the undue delay or detention of ships, the communication of information, technical assistance and cooperation, dispute settlement and the Convention’s relationship with international law and other international agreement–enforcement proceedings.

The Annex to the Convention includes four chapters. Chapter 1 addresses the General Provisions of Regulations 1–3. Chapter 2 introduces the requirements for ships in Regulations 4–14. Chapter 3 discusses the requirements for ship-recycling facilities in Regulations 15–23. Finally, Chapter 4 notes the reporting requirements in Regulations 24–25.

In addition to the Annex, there are seven appendices established under the Convention. Appendix 1 deals with the control of hazardous materials. In order to control hazardous materials, the appendix first lists the type of hazardous material, defines it and then notes the

control measures. The ‘minimum list’ of items for the inventory of hazardous materials is introduced in Appendix 2. Appendix 3 comprises the ‘*form of the international certificate on inventory of hazardous materials,*’ ‘*endorsement to extend the certificate if valid for less than five years where regulation 11.6 applies,*’ ‘*endorsement where the renewal survey has been completed and regulation 11.7 applies,*’ ‘*endorsement to extend the validity of the certificate until reaching the port of survey or for a period of grace where regulation 11.8 or 11.9 applies,*’ and ‘*endorsement for additional survey.*’ In dealing with ship-recycling facilities, Appendix 4 indicates the, ‘*form of the international ready for recycling certificate*’ and ‘*endorsement to extend the validity of the certificate until reaching the port of the ship-recycling facility for a period of grace where regulation 14.5 applies.*’ Consequently, the form of the authorization of ship-recycling facilities is adopted under Appendix 5. Appendix 6 goes through the form for reporting a planned start of ship recycling. Finally, Appendix 7 addresses the form for the statement of completion of ship recycling.

2.3. The enforcement of the 2009 Hong Kong Convention

Article 3.1 of the 2009 Hong Kong Convention states that, unless otherwise expressly addressed in the Convention, the Convention shall apply to the following:

- - ships entitled to fly the flag of a Party or operating under its authority (3.1.1) and
- - ship-recycling facilities operating under the jurisdiction of a Party (3.1.2).

Article 3.1.1 allows the application of the Convention in a broader range, using the phrase ‘operating under its authority’ rather than just ‘ships entitled to fly the flag of a Party.’ However, this drafting also introduces ambiguity related to the definition of ‘operating under its authority.’ The Convention does not define the operation of a ship, a state’s authority and how to limit that authority. This drafting is expected to lead to further problems in the future.

Despite this problem, some delegations during the discussions argued that the exclusions were not consistent with the spirit of the Convention ([Mikelis, 2006](#)) because Article 3.2 excludes the application of the Convention to any warships, naval auxiliary ships or other ships owned or operated by a Party and used for governmental, non-commercial services. Article 3.3 states that the Convention shall not apply to ships of less than 500 GT. Article 3.3 also states that ships operating throughout their life only in waters subject to the sovereignty or jurisdiction of the State whose flag the ship is entitled to fly are excluded from the application of the Convention. For the non-Party States, Article 3.4 states that the Parties shall apply the requirements of this Convention to ensure that favorable treatment is not given to such ships.

One of the most noteworthy points in the Convention is Article 16.4, which deals with States that comprise two or more territorial units in which different systems of law apply to a matter dealt with by the Convention. This approach will allow States to apply the Convention to one, two or more or all of their territorial units together or separately if the State has two or more territorial units that have different legal systems. As often as possible, the Convention aims to achieve the signature, accession and ratification of States—particularly China, as it is one of the largest participants in the ship-recycling industry.

Article 17 of the Convention requires three conditions to be complied with simultaneously for the enforcement of the Convention. These conditions are listed below.

- - At least 15 or more States should sign the Convention without reservation as to ratification.
- - The combined merchant fleets of the States that have already signed the Convention should represent at least 40% or more of the gross tonnage of the global merchant shipping volume.
- - The combined maximum annual ship-recycling volume of the States that have already signed the Convention should constitute at least 3% or more of the gross tonnage of the combined merchant shipping of the same States during the preceding 10 years.

Article 15 regulates the relationship between the Convention and other international agreements. In accordance with Article 15.1, the Convention shall not prejudice the rights and obligations of any State under the United Nations Convention on the Law of the Sea (UNCLOS) and under the customary international law of the sea. In addition, Article 15.2 states that the Convention shall not prejudice the rights and obligations of Parties under other relevant and applicable international agreements. Even though the article aims to achieve co-existence of the International Conventions and customary law with the 2009 Hong Kong Convention, such an article may cause several problems related to

- - the inconsistencies in practice among the International Conventions, particularly UNCLOS and the 2009 Hong Kong Convention,
- - the lack of global application of the 2009 Hong Kong Convention and
- - the membership status of the States that are Parties to the 2009 Hong Kong Convention to other International Conventions.

3. The impact of the 2009 Hong Kong Convention on ocean law and policy

3.1. The current capacity of the world merchant marine fleet

In accordance with Article 17, the capacity of the operating world merchant marine fleet is one of the key issues in the enforcement of the 2009 Hong Kong Convention. The world fleet changes continuously, old ships are replaced by new ones and, though some of the old ships are sent for recycling, some are used for other purposes such as stores, hotels or restaurants. In addition, some ships are removed from the world merchant fleet as a result of an accident. However, due to the non-existence of a global ship-registration system, the flag of convenience and the lack of Flag State's reporting and information, the certified capacity of merchant marine fleet varies from one database to another.

As [Mikelis \(2007\)](#) revealed in 2005, the capacity of the world merchant marine fleet over 100 GT comprised 92,105 ships and that the capacity of the fleet over 500 GT comprised 47,258 ships. By 2006, the capacity of the fleet over 100 GT had increased to 94,936 ships and the capacity over 500 GT had increased to 49,213 ships. [Sundelin \(2008\)](#) stated that the capacity of the merchant marine fleet over 500 GT was estimated at more than 50,000 ships in 2008. These reports, however, include ships that are owned by governments for non-commercial services or are used solely for domestic voyages. Article 3 of the 2009 Hong Kong Convention excludes ships that are owned by governments for non-commercial services and ships that are used solely for domestic voyages. Thus, the capacity of the merchant marine fleet that is subject to the 2009 Hong Kong Convention is estimated at approximately 42,000–45,000 ships.

Despite this, [Mikelis \(2007\)](#) stated that the estimated request capacity for ship recycling is over 900 but less than 1000 per year. [Vedeler \(2006\)](#) reported that approximately 4000 vessels per year are sent to recycling yards around the world. A study by [Andersen \(2001\)](#) stated that the annual expected scrapping rate is around 500–700 vessels per year. The discrepancies among the reports are based on several reasons:

- – a lack of reports and information from the ships that are subject to the recycling process,
- – some ships that are already reported as recycled are subsequently found to have been traded onwards,
- – many of the ships that are subject to ship recycling are reported a considerable time after they were recycled,
- – the reports of the details of ships subject to recycling vary from one year to another due to a lack of timely ship-recycling reports, thus making the accuracy of the data questionable,
- – the differences in the reports published by the different maritime data providers and
- – the inaccuracy of the ship-recycling databases, particularly for the smaller-sized merchant marine fleet.

In addition to the general factors of the ship-recycling market, there are two main factors to be considered. First, as a result of the global financial crisis, some ships, particularly old ships, have been retired and then sent for recycling. Secondly, in order to try to prevent tanker incidents and the subsequent marine pollution, the IMO set a timetable for phasing out single-hull tankers. In accordance with the International Convention for the Prevention of Pollution from Ships 1973 (MARPOL 73) and its modified Protocol 1978 (known as MARPOL 73/78) Annex I, Regulation 13 G, the final phasing-out date for a Category 1 (pre-MARPOL 73/78) tanker was established in 2005. The final phase-out date for Category 2 and 3 tankers was first established in 2005 and then changed to 2015. The EU Member States and other leading maritime merchant States declared, however, that they will not allow single-hull tankers to sail to their ports. This restriction may be a reason for ship owners to renew their tanker fleets

and, therefore, send their aged single-hull tankers for recycling ([\[Lauridsen et al., 2003\]](#) and [\[10\]](#)).

4. The future impact and prospects of the 2009 Hong Kong Convention on ocean law and policy

The ship-recycling industry has a negative influence on the natural and marine environment. On the other hand, the working conditions, occupational safety and health issues in recycling yards can pose a threat to the life and health of workers. Prior to the 2009 Hong Kong Convention, there were no specific internationally recognized standards addressing the above-mentioned issues. The 2009 Hong Kong Convention will certainly have an impact on the designation of a global marine legal system and policy.

As stated in the preamble of the 2009 Hong Kong Convention, there is concern about the environment and occupational safety and health, yet it is recognized that the ship-recycling industry contributes to sustainable development. This drafting method aims to achieve a consensus between economic demands and expressed concerns. The 2009 Hong Kong Convention introduces the following control instruments:

- - a Flag State control system is established to ensure that the ships entitled to fly its flag or operate under its authority shall comply with the requirements set in the Convention,
- - the State in whose jurisdiction the ship-recycling facilities operates establishes a control system to ensure that the above-mentioned ship-recycling facilities comply with the 2009 Hong Kong Convention,
- - the new surveying regime envisages an initial survey to verify the inventory of hazardous materials, surveys during the operating life of the subject ship and a final survey prior to entering into the recycling process,
- - the authorization regime of the ship-recycling facilities should be established by the States in accordance with the 2009 Hong Kong Convention,
- - the introduction of an information exchange system between the Parties,
- - the list of hazardous materials whose installation or use is prohibited and/or restricted in ships, shipyards, ship repair yards or offshore terminals,
- - the inventory of hazardous materials, specific to each ship,
- - the ship-recycling plan, which includes details relevant to subject ships, including particulars and inventory,
- - the introduction of an issuing process for an international, ready-for-recycling certificate,
- - the introduction of the ship-recycling facility plan, which ensures attention is given to addressing occupational safety and health issues, providing appropriate

information and training workers, establishing an emergency preparedness and response plan, designing a system for monitoring the performance of ship recycling and record-keeping systems,

- - the establishment and utilization of procedures to prevent adverse effects on human health and the environment,
- - the introduction of safe and environmentally sound management systems for hazardous materials,
- - the establishment of reporting systems for incidents, accidents, occupational diseases and chronic effects and
- - the introduction of a final reporting system upon the completion of ship recycling.

From an environmental perspective, the 2009 Hong Kong Convention aims to create a comprehensive regime throughout the life cycle of a ship and to integrate it into the global marine environmental system. Article 1.1 states that Party States are obligated to give full and complete compliance to its provisions in order to prevent, minimize and, to a practical extent, eliminate injuries and other adverse effects on human and environmental health caused by ship-recycling activities. To achieve this comprehensive purpose, Annex Chapter 1, Regulation 3 stipulates that Party States shall take measures to implement the requirements of the regulations of the Annex, taking into consideration the relevant and applicable technical standards, recommendations and guidance developed under the 1989 Basel Convention. In addition, Annex Chapter 2, Regulation 8 requires that ships that are subject to recycling shall only be recycled at ship-recycling facilities that are authorized in accordance with this Convention and fully authorized to undertake the entire ship-recycling process. As a result, ship recycling has been prohibited unless the ship-recycling process is conducted in a fully authorized ship-recycling facility. In order to avoid any adverse effects on the environment, the owners of ships that are subject to ship recycling shall conduct all operations in the period prior to entering the ship-recycling yard.

Article 4.1 sets forth the Flag State control system and, to achieve this purpose, Article 5 states that each Party State shall ensure that ships flying its flag or operating under its authority are subject to survey and certification. With regard to these Articles, Annex Chapter 2, Regulation 10 stipulates that the Administration (Flag State Administration) shall survey the ships by taking into consideration the guidelines adopted by the IMO. Regulation 10.4 states that, in every case, the Administration shall be responsible for ensuring the completeness and efficiency of the survey and shall ensure the necessary arrangements to satisfy this obligation.

Article 6 of the 2009 Hong Kong Convention states that each Party State will ensure that ship-recycling yards will be operated under its jurisdiction. Furthermore, Article 4.2 states that each Party State shall require the ship-recycling facilities under its jurisdiction to comply with the requirements set forth in the 2009 Hong Kong Convention and shall take effective measures to ensure such compliance. Detailed requirements for ship-recycling facilities are prescribed under Annex Chapter 3. Regulation 15 of the Annex states that each Party State shall establish legislation, regulations and standards that are essential to ensure that ship-recycling facilities are designed, constructed and operated in a safe and environmentally

sound manner. In accordance with Regulation 15.2, ship-recycling facilities should meet the requirements of the 2009 Hong Kong Convention. To achieve this purpose, each Party State is obliged to establish an authorizing mechanism for ship-recycling facilities whether or not those facilities meet the requirements. In addition, Regulation 15.3 states that each Party State should establish a mechanism for inspections of the ship-recycling yards. The authorization and inspection systems, which concern ship-recycling yards, aim at an integrated, comprehensive and continuous recycle-controlling system.

Furthermore, Regulation 17 of the Annex requires that ship-recycling facilities shall establish management systems, procedures and techniques that should prevent, reduce, minimize and, where possible, eliminate adverse effects on the environment caused by ship recycling, taking into consideration the guidelines adopted by the IMO. In accordance with Regulation 17.2, ship-recycling facilities are only allowed to accept ships that

- - comply with the 2009 Hong Kong Convention

or

- - meet the requirements of the Convention.

In addition to these regulations, Regulation 18 of the Annex stipulates that ship-recycling facilities shall adopt a ship-recycling facility plan and that this plan shall include the following:

- - a policy that ensures environmental protection,
- - an emergency preparedness and response plan,
- - a system for monitoring the performance of ship recycling,
- - a record-keeping system and
- - a system that reports discharges, emissions, incidents and accidents causing damage or with the potential to cause damage to the environment.

Ship-recycling facilities shall ensure the safe and environmentally sound removal of any hazardous material contained in a ship, certified in accordance with Regulations 11 and 12 of the Annex. Waste management and disposal sites shall be identified to provide for the further safe and environmentally sound management of materials. Furthermore, all waste that is generated from the recycling activity shall be kept separately from recyclable materials and equipment shall be labeled, stored in appropriate conditions and finally, transferred to a waste-management facility that is authorized to deal with its treatment and disposal in a safe and environmentally sound manner.

For any emergency, Regulation 21 states that a ship-recycling facility shall establish and maintain an emergency preparedness and response plan. The plan shall ensure that an information communication and a coordination system that provides protection for all people and the environment is established and provides first-aid, medical assistance and fire-fighting services and a strategy for evacuation and pollution prevention.

The 2009 Hong Kong Convention introduces a new system that aims to exchange information between Party States via the IMO. If one of the Party States so requests, the State where the ship-recycling facilities are authorized under its jurisdiction shall provide the relevant information to the IMO and should be exchanged in a swift and timely manner. The 2009 Hong Kong Convention pays particular attention to inspections of the subject ships and states that the ships subject to recycling may be inspected by officers for the purpose of determining whether or not the ship complies with the requirements of the Convention. This inspection is mainly based on and limited to a valid 'International Certificate on Inventory of Hazardous Materials' or 'International Ready for Recycling Certificate.' If, however, the ship does not carry a valid certificate or there are clear grounds for believing that

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- the condition of the ship or its equipment does not correspond substantially with the particulars of the certificate and/or the inventory of hazardous materials

or

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- there is no procedure implemented on board the ship for the maintenance of an inventory of hazardous materials

a detailed inspection may be carried out, taking into consideration the guidelines developed by the IMO.

In summary, the 2009 Hong Kong Convention establishes control and enforcement instruments related to ship recycling, determining the control rights of Port States and the obligations of Flag States, Parties and recycling facilities under its jurisdiction. The Convention also controls the communication and exchange of information procedures, establishes a reporting system to be used upon the completion of recycling, and outlines an auditing system for detecting violations.

4.1. Deficiencies arising from the 2009 Hong Kong Convention

The 2009 Hong Kong Convention aims to achieve a comprehensive, globally and continuously applicable, environmentally sound ship-recycling regime. Nonetheless, the structure of the 2009 Hong Kong Convention has deficiencies. Despite the entry into force of the conditions, the application of the Convention has experienced difficulties that have caused problems. In addition, the 2009 Hong Kong Convention itself does not introduce a compulsory and environmentally sound ship-recycling method.

The 2009 Hong Kong Convention establishes a comprehensive system, working on a timely basis, that covers instruments for such aspects as outlining the Flag State, Port State, State Party and ship-recycling facilities under its jurisdiction, detecting violations, requiring inspections and controlling waste management. The system should take into account the

periods before recycling, during recycling and after recycling. The Convention only stipulates rules for the periods before the recycling and during the recycling. While the Convention stipulates the rules relating to waste management (after scrapping has been concluded), it does not address how to deal with the management process during the final stage. The final management of waste generated from the ships has not been stipulated in the Convention and has not been expressly integrated with the other international environmental protection regimes. Despite the fact that the Convention stipulates the co-existence of the relevant international legal instruments, in practice, problems may arise from such ambiguities.

Second, due to the lack of a global ship-registration system, estimations regarding the future of the ship-recycling industry are far from clear. As a result, the survey, inspection and reporting systems of the Convention may not work as well as expected in practice.

Third, the application of the 2009 Hong Kong Convention does not comply with the ultimate aim of the environmental approach and has some significant exclusions. The new Convention excludes warships, naval auxiliary ships or other ships owned or operated by a Party and used only on governmental, non-commercial service. Thus, the Convention is solely applicable to commercial ships. In addition, the Convention excludes ships that solely operate in waters subject to sovereignty or jurisdiction of the State whose flag the ship is entitled to fly. Finally, the new Convention is also not applicable to ships of less than 500 GT. These exclusions limit the global application of the Convention and may thus limit its efficiency and success.

Furthermore, the 2009 Hong Kong Convention requires three pre-conditions that must be complied with simultaneously before becoming effective. The first condition requires that at least 15 or more States sign the Convention, which is the easiest step to be achieved. The EU members and the OECD members have a consensus to sign and enforce the Convention. As a result, the combined maritime merchant fleet capacity of these States constitutes at least 40% of the gross tonnage of the world's merchant shipping capacity and, consequently, meets the second pre-condition. However, the third pre-condition depends on the signature of the five main ship recycling States, including Bangladesh, China, India, Pakistan and Turkey. Among these States, the only OECD Member State is Turkey, and this omission poses a problem.

It is fortunate that China has the legal framework and preparedness order to meet the new Convention's requirements. In contrast, Bangladesh, India and Pakistan are still far from complying with the requirements of the new Convention and have reservations about signing the new Convention. Thus, the success of the 2009 Hong Kong Convention is questionable so far.

Last, but not least, the new 2009 Hong Kong Convention does not introduce compulsory and environmentally sound methods of ship recycling. There is no prohibition or restriction on grounding or beaching a ship. Although the Convention requires pre-cleaning, survey and certification, grounding a ship on the beach may still cause marine environmental pollution. The grounding of a ship, in any way, offers potential risks to the marine environment and the new Convention does not introduce any improvement measures to tackle that matter. Based on the above discussion, the 2009 Hong Kong Convention is still far from achieving the ultimate aim of sustainable development.

5. Concluding remarks

The concept of environmentalism is an essential pillar of sustainable development. This concept has already influenced the IMO's attitude toward the protection of the marine environment. The IMO has introduced conventions and regulations and established a global marine environmental protection regime. At present, the IMO is concerned with the ship-recycling industry and its potential adverse effects on the environment. Taking into consideration the economic issues, occupational safety and health issues and environmental issues, the IMO has introduced the 2009 Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships as a conclusion to the *ad hoc* meeting gathered in Hong Kong from May 11–15, 2009.

The new 2009 Hong Kong Convention introduces a comprehensive regime to achieve environmentally sound ship-recycling methods and obliges Party States to take appropriate measures to establish a domestic legal framework in order to prevent, reduce, minimize and eliminate the adverse effects on the environment caused by ship recycling. The new Convention categorizes the obligations of Port States and Party States in situations where the ship-recycling facilities operate under their jurisdiction. Furthermore, the new Convention stipulates rules for the procedures involved in the operation and recycling of ships, such as the survey, inspection and certification of ships. In addition, the new Convention sets obligations for the ship-recycling facilities, such as preparing a ship-recycling facility plan to exchange information if so requested and to report the completion of ship recycling. The general principles have been stipulated under the Convention and further details are explained and stated within the Annex. Other relevant information, documents and lists are included under 7 Appendices of the Convention. This system shows that the IMO would like to establish a comprehensive and globally applicable ship-recycling regime and integrate it with the marine environmental protection regime via transition and the enforcement articles. By adopting the IMO's single-hull phase out regime and in recognition of the results of the global financial crisis, there are more ships sent for recycling than expected. The above circumstances reiterate the significance and importance of a global and comprehensive ship-recycling regime.

Although the new Convention is an essential development for the marine environment protection regime and the industry, it still has deficiencies. These deficiencies arise from the structure of the Convention, as it lacks an integrated regime for the protection of the marine environment. Furthermore, the success of the Convention depends on the signatures of Bangladesh, China, India, Pakistan and Turkey. However, aside from China and Turkey, the remaining countries have reservations about signing the Convention and these issues may affect its future viability. The application of the Convention is limited to ships of 500 GT or above, so almost half of the ships sailing around the world are excluded from the Convention. In addition, the Convention does not offer a clearly defined method or methods for the recycling process and leaves this to the authority of the States' domestic laws and regulations. The result is that the methods may vary between States. Even so, it is important to note that the new 2009 Hong Kong Convention will offer a necessary improvement in the global marine environment protection regime upon its coming into force.

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²Ship recycling, ship breaking, ship scrapping, ship dismantling and ship demolition are not well-defined terms. With due respect to the terms that are used in the Hong Kong Convention, the authors prefer to use the term of ‘ship recycling’ in this study. Another reason for using the term ‘ship recycling’ is related to the comprehensive content of the recycling process, which is more extensive than breaking, scrapping, dismantling or demolition.

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