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Study on the defects of legislation and supervision on ship recycling in China : based on the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009

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STUDY ON THE DEFECTS OF LEGISLATION AND SUPERVISION OF SHIP RECYCLING IN CHINA: BASED ON THE HONG KONG INTERNATIONAL CONVENTION FOR THE SAFE AND ENVIRONMENTAL SOUND RECYCLING OF SHIPS

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DECLARATION

I certify that all the material in this research paper that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this research paper reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): .....

(Date): .....

Supervised by: Professor Wu Wanqing

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ABSTRACT

Title of dissertation: **Study on the Defects of Legislation and Supervision on Ship Recycling in China: Based on the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009**

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Ship recycling industry has been known as the green metallurgical industry. Through dismantling old ships reasonably, it can reduce the international consumption of resources by recycling a large amount of steel. On the other hand, the ship recycling industry can eliminate end-of-life ships reasonably, avoiding pollution to the environment. It is beneficial for the balanced development of shipping industry, steel industry, shipbuilding industry and other industries.

However, the ship-recycling industry is a high-risk and high-pollution industry, which can probably cause occupational health and safety or environmental pollution if there are no proper standards and regulations. Therefore, some international organizations have established some legal instruments to solve these problems. For example, International Maritime Organization has paid close attention to environmental safety, health and welfare matters of the ship recycling industry early since 1998．International Maritime Organization，International Labour Organization and the Basel Convention Organization have developed their recommendatory guidelines according to their obligations from their perspectives． But the implementation of these guidelines is unsatisfactory, which causes the race-to-bottom competition in the ship recycling industry. So the International

Maritime Organization was considering providing all new legally-binding and globally applicable regulations for international ship recycling. As a result, the new instrument named Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships has been adopted in the International Maritime Organization Diplomatic Conference dated May 2009. In order to promote the implementation of the Hong Kong Convention in advance, on November 20th, 2013, the Europe Parliament and the Council of the European Union adopted the Regulation for ship recycling based on Hong Kong convention, which means the actual implementation of Hong Kong convention in Europe. All these measures taken by IMO and European Union mean that the world has proposed new provisions on ship recycling, which has more strict environmental protection and work safety standards.

As one of the most important recycling countries, and also one responsible power in world affairs, China has tried its best to catch up with the trend of the international ship recycling industry. Recent years, ship recycling industry in China has promoted green ship recycling actively, which is the industry standard for safety, health, the environment and welfare in the ship recycling process. But there are still many problems in the ship recycling industry in China: the legal framework is still far away from fully meeting the requirements of the new international legal instruments; the relevant ship recycling provisions of China are included in various laws and regulations, where there is a lack of proper logic; there are overlapping or missing responsibilities in the supervision of ship recycling. Therefore, the analysis of the ship recycling relevant legal and supervision issues has practical significance and research value.

In addition to introduction and conclusion, this paper is divided into four chapters:

The first chapter wants to have a preliminary understanding of the ship recycling industry from the past situation，the present situation and the future prospects. The mode of ship recycling industry in China will be compared with other patterns all over the world to identify the right developing direction of China' ship recycling industry. It also shows clearly the opportunities and challenges to China's ship recycling industry.

The second chapter is analysis on current domestic legislation and supervision in China for ship recycling industry, compared with relevant international conventions on ship recycling and the advanced legislations and supervision in the shipping developed countries. The Basel Convention, Hong Kong Convention and Europe Regulation on Ship Recycling will be studied in detail for the purpose of further analysis and discussion to the ship recycling issues.

The third chapter focuses on defects of China's legislation on the comparative analysis of the regulations about ship scrapping，scrapped ship import and export and safety and environmental protection during ship recycling process.

The last chapter makes suggestions to improving the legislation system and supervision of ship recycling on the basis of the above analysis.

KEYWORDS: Ship recycling, the Hong Kong Convention, China ship recycling industry, Legislative proposals, Safe and environmentally sound recycling of ships, occupational health and safety, China domestic legislation

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List of Abbreviations

CNSA	China National Shiprecycling Association
EHS	Environment Health and Safety
FIDH	International Federation for Human Rights
FOC	Flag State of Convenience
GT	Gross Tonnage
ILO	International Labour Organization
ICRV	Investment Information and Credit Rating Agency of India Limited
IMO	International Maritime Organization
OHS	Occupational Health and Safety
LDT	Light Displacement Tonnage
MEPC	Marine Environment Protection Committee
OECD	Organization for Economic Cooperation and Development
PIC	Prior Informed Consent
The Basel Convention	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989
The Hong Kong Convention	Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009
UNCTAD	Unite Nations Conference on Trade and Development

Chapter I Introduction

Shipbuilding industry, shipping industry, and ship breaking industry is a complete industrial chain, while ship recycling market is a unique market which was naturally formed by conforming the requirements of all kinds of materials utilization and recycling. Under normal conditions, a ship's operation period can last 20 to 25 years or more, from the construction completed. After that, most ships will be scrapped to be recycled. The withdrawal of the aged vessel and the investment operation of the new ship are a natural process of commercialization. Compared with other ways of disposing of scrapped ships such as idle or scuttling, the ship breaking, to the greatest extent, can make use of ship steel and other materials and equipment. Therefore, ship breaking industry in the world is known as the ship recycling industry.

Although the ship recycling as basic method of scrapping ships is correct, the ship recycling industry has some serious hazards to environmental protection, occupational safety and health. Wastes or hazard materials can be generated in the process of ship recycling because end-of-life ships or ships destined for scraped usually carry oil sewage, waste, toxic and harmful substances within them. Furthermore, improper recycling can cause pollutions to the ocean, inland waters, land environment and atmospheric environment. The worst thing of improper ship recycling is indirect or direct harms to personal safety and human health. Therefore, it is imperative to establish a set of legal instruments and reasonable supervision system to regulate ship recycling industry.

Being aware of risks of the ship recycling for environmental and OHS, some global organizations have taken a series of legislations to regulate the ship recycling industry, such as the Basel Convention and some guidelines (IMO, 2005) of IMO. As one of the world's main ship recycling countries, China, from its own reality, combined with the requirements of relevant international conventions, formulated a series of laws and regulations for the supervision of ship recycling activities. With growing concern on environment protection and OHS, the risks caused by ship recycling are attracting more and more attention. Therefore, some new international conventions such as the Hong Kong Convention related to the ship recycling were established, which have more strict standards. China's domestic legislation on ship recycling industry will also face challenges from both the external international strict provisions and its rapid growth of domestic ship recycling industry.

China’s domestic legislation on ship recycling will be analyzed and evaluated from the following aspects: Whether the China domestic laws and regulations and the supervision system are consistent with the status of China's ship recycling industry； Whether China domestic laws and regulations and the supervision system is in accordance with the requirements of international conventions; whether China domestic laws and regulations and the supervision system is conducive to the future development of China's ship recycling industry.

Chapter II History, Current Situation and Prospect of Ship Recycling Industry

2.1 The History, Current Situation and Prospect of World Ship Recycling Industry

The world ship recycling industry began in the early 1950's after the World War II. At that time the world center of industry was mainly in the northern Europe, Southern Europe, and America. The quantity of ships dismantling was very limited, and the ship recycling countries were mainly dealing with ships of their own. For example, Norway, which was one of the main ship recycling countries, dismantling the domestic whaling ship; USA mainly dismantled the warships of Naval Reserve ship; the Soviet Union dismantled domestic aging fishing boats and warships.

Since the late 1960s, the ship recycling industry entered an active period. The volume of ships dismantled increased rapidly, and at the same time, many countries began to send their ships to be dismantled in other countries. The ship recycling industry gradually became an open free market. Japan, Korea and Hong Kong became the world's major ship demolition areas. The second half of 1970s was the era when a large number of oil tankers was dismantled, the world's center moved to the Taiwan region of China and South Korea. But in the late 1980s, with the ship demolition market setting off the third upsurge, Chinese Taiwan and South Korea have withdrawn from the center of ship recycling industry, the world' ship

recycling business shifted from East Asia to South Asia countries such as China mainland, India, Bangladesh, and Pakistan.

There are about 700(1.55%) out of 45,000 sea-going ships are taken out of service every year (FIDH, 2002). The ship recycling industry is closely related to shipping market cycles and during economic recession times. When freight rates are low and ship owners are short on cash, old and obsolete vessels will be sold to scrap dealers in the demolition market providing a source of cash to ship owners (M. Stopford, 2009, p.178). The global shipping downturn and weak macro-economic headwinds since 2009 have facilitated the growth of the ship breaking industry with there being an increase in the supply of ships to be scrapped (ICRV, 2012). Table 1 shows the ships before the 2009 recession, both the number and GT of ships for demolition

Table 1- Recycling Statistics (ships > 499 GT)

Year of recycling	number of ships (n)	average age (μ)	standard deviation (σ)	Gross Tonnage (GT)	average GT
2006	386	32.6	7.9	4,311,039	64,946
2005	361	32.7	8.9	4,036,787	71,002
2004	615	31.7	8.7	7,478,622	76,885
2003	874	29.7	7.3	16,532,724	85,746
2002	740	28.2	6.2	18,079,566	88,500
2001	772	27.7	5.7	15,903,761	84,537
2000	706	27.3	5.9	14,087,466	87,265
1999	829	26.2	5.4	19,534,461	86,918
1998	801	26.3	5.1	14,343,031	76,259
1997	735	26.5	5.5	10,674,688	79,006
1996	672	26.7	7.1	11,206,752	84,742
1995	649	26.6	6.9	10,226,503	95,645
1994	694	26.6	8.1	12,807,811	98,692
1993	549	26.6	7.8	10,721,544	92,328
1992	450	26.2	7.7	7,566,541	84,435
1991	325	25.7	7.4	3,301,650	73,195
1990	231	25.7	7.8	1,983,758	67,863
TOTALS	**10,389**	**27.7**	**6.9**	**182,796,704**	**17,595**

Source: N. Mikelis, 2007.

decreased in 2004, 2005 and 2006 compared with years before 2004. But Table 2, 3 and 4 illustrate after the 2009 recession, the number and GT of ships for demolition increased rapidly, reaching a peak in 2012.

Table 2 Tonnage reported for demolition, major ship types and countries of demolition (2011, thousands of GT)

	Indian	China	Bangladesh	Pakistan	Turkey	Rest of the World	Total
Tankers	1811	610	830	1485	98	157	4992
Bulk Carriers	3215	4367	4527	1240	205	114	13668
Container and other passenger	3370	1318	464	176	830	353	6511
Offshore and other work vessels	366	59	136	548	18	260	1388
Total	8762	6534	5957	3449	1152	884	26558

Source: Compiled by the UNCTAD secretariat, on the basis of data supplied by IHS Fairplay.

Table 3 Tonnage reported for demolition, major ship types and countries of demolition (2012, thousands of GT)

	Chin a	India n	Banglade sh	Pakista n	Unknown Indian subcontine nt	Turke y	Others and unknow n	Worl d total
Tankers	1549	369	1197	2711	191	21	200	6149
Bulk Carriers	5533	5446	6064	1959	205	365	720	2029 3

General Cargo	316	393	1166	28	-	291	471	2665
Container Ships	316	553	2954	7	216	124	76	4246
Gas Carriers	4	89	30	-	-	77	38	238
Chemical tankers	7	11	333	-	21	-	27	399
Offshore	154	4	44	649	156	75	100	1182
Ferries and passenger ships	12	4	82	-	-	139	66	303
Other	55	158	386	17	-	146	56	817
Total	7855	7027	12256	5372	790	1239	1755	36293

Source: Compiled by the UNCTAD secretariat, on the basis of data from Clarkson Research Services.

The ship breaking industry is expected to continue witnessing a steady supply of vessels for demolition over the medium term because the world economy recovers slowly. The slow increase of the shipping freight rate will supply a steady tonnage for the ship recycling industry.

Table 4 Tonnage reported for demolition, major ship types and countries of demolition (2013, thousands of GT)

	China	Indian	Bangladesh	Pakistan	Unknown Indian subcontinent	Turkey	Others and unknown	World total
Tankers	748	791	994	2680	278	57	296	5844
Bulk Carriers	3524	2934	4222	1335	132	241	277	12665
General Cargo	332	930	202	99	12	332	306	2211
Container Ships	795	3195	888	22	119	77	128	5223
Gas Carriers	249	63	-	-	6	29	35	382
Chemical tankers	13	75	23	40	-	13	53	218
Offshore	13	127	115	943	39	3	190	1429
Ferries and passenger ships	-	109	-	-	-	171	42	322
Other	450	186	63	-	-	49	10	758
Total	6124	8409	6506	5118	586	973	1336	29052

Source: Compiled by the UNCTAD secretariat, on the basis of data from Clarkson Research Services.

2.2 The Main Ship Recycling Countries and Modes of Recycling in the World

Chapter 2.1 predicates that there will be a steady supply of ships to be recycled, just as the top half Figure 2. Meanwhile, the bottom half of Figure 2 illustrates demand side considerations for materials recycled from scrapped ships that determine where a vessel is scrapped. Steel provides by ship recycling industry with the bulk of their revenues: re-rollable scrap especially useful for bars and rods in construction constitute at least 70% of a typical ship's light displacement tonnage (LDT), while another 10–20% is of melting scrap (World Bank, 2010, pp. 12–13). Being less energy-intensive, steel finished from re-rolled scrap is less expensive to produce than that from melting scrap. Besides the steel needs, other country demand factors are labour costs for retrieving recyclable materials and national environmental, health and safety (EHS) regulations impacting the ship recycling industry (Yujuico, E., 2014). Different labour costs and EHS regulations decide different ship recycling sites and modes. It is the low labour cost and relative lower EHS regulation standards that attract the nearly 90% GT of ships recycled in South Asia (Ravichandran, K. et. al, 2012). From Figure 3, 4, and 5, it is clear that India, China, Bangladesh and Pakistan dominate the world ship recycling industry, recycling more than 90% GT in the world.

Ship recycling occurs in four sites: in a dry dock, at a pier, on a slipway (concrete ramp) or on a beach. Generally speaking, EHS risks increase from a dry dock to a pier or slipway and then to a beach. Not only does maritime pollution accident are more likely to happen when ship recycling takes place nearer a body of water, but occupational health hazards also increases together with far distance from suitable

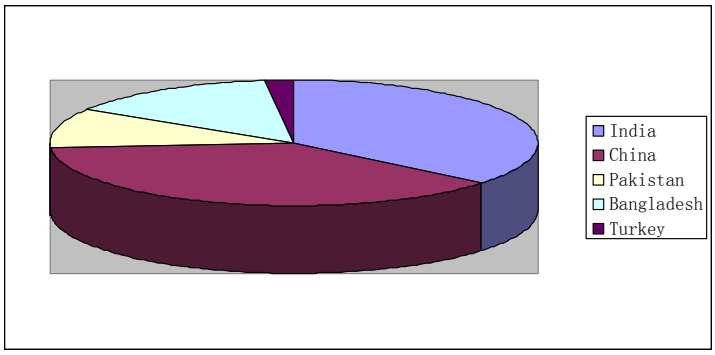

Figure 1-Ship Recycling Activities per Region 2011(Total DWT Scrapped)

Source: Intermodal Research

facilities. Based on features of the environmental protection technology, the current global ship recycling industry can generally be divided into three major modes: EU mode, China mode and mode of India and Pakistan (Zhou, J., 2009).

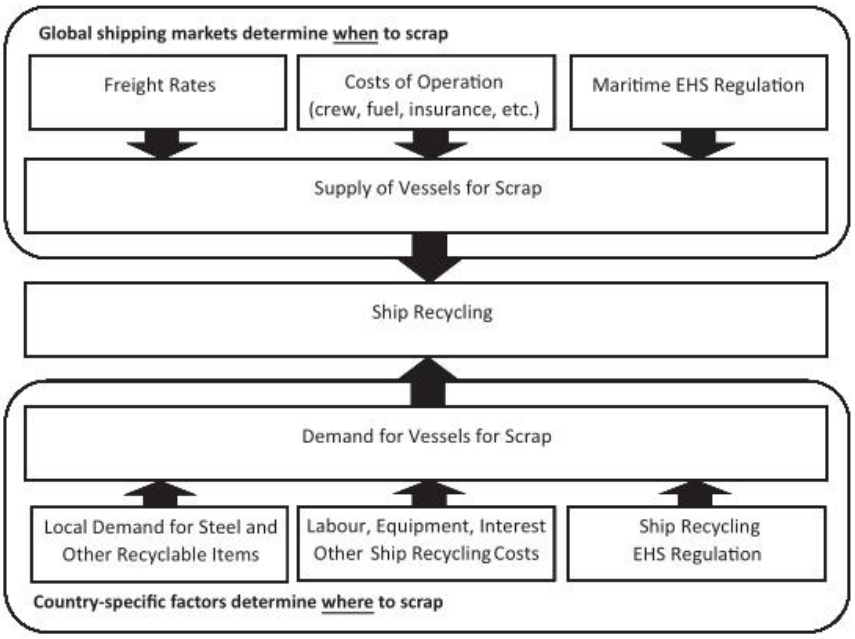

Figure 2: Economics of ship recycling

Source: Yujuico, E. (2014). Demander pays: The EU and funding improvements in South Asian ship recycling practices. *Transportation Research Part A, 67(2014),* 340–351.

EU mode is mainly related to European countries besides several developed countries such as the United States and Japan. Because these developed countries have very high environmental protection standard, they currently only recycle small amount of their own ships with high-tech equipments rather than recycling imported foreign ships. This method mainly uses the dry docks to recycle ships, which is the safest, cleanest method of ship recycling but is undertaken relatively rarely due to the expense of building and maintaining dry docks facilities (Lloyd's Register, 2011). The ship enters dry docks and is dismantled piece by piece. The chances of accidentally polluting surrounding waters are virtually zero since everything is contained by the dock. Frankly speaking, the Europe mode of ship recycling industry comes with high technology and high labour costs. From the view of total demolition GT, ship recycling in these countries has gradually marginalized.

China Mode of ship breaking industry, although weaker than Europe mode in technology and environmental protection standards, has its own unique advantages, such as low labour costs, and government policy support to the dismantling of ships imports. Beaching is forbidden in China and ship recycling is undertaken alongside. The whole process is under supervision, from ship to landfill. Yards are relatively strongly regulated by the government and can also be subject to intense scrutiny from the local authorities (Lloyd's Register, 2011). So far, some companies of the ship recycling have been recognized by the International Environment Management System and Occupational Health and Safety Management System, becoming the influential International first-class ship recycling enterprises (Wang, B., 2009).

India and Pakistan mode mainly refers to South Asia countries, such as India, Pakistan and Bangladesh. Despite the elusive size of the industry and its grave

effects, South Asian countries mainly carry out their ship recycling on beaches—Chittagong in Bangladesh, Alang in India, and Gadaniin Pakistan. At spring tides, ships can be driven as far up the beach as possible, over the mudflats and onto the beach. A major issue with dismantling ships on tidal mudflats is that any spills of oil or cargo remaining on board are likely to be swept out to sea by the next tide. Although these countries account for world leading part of world ship recycling industry, their ship recycling process pays little attention EHS. But India and Pakistan mode is very competitive currently because of their low labour costs, low standards in environmental protection and occupational safety and health.

2.3 The History, Current Situation and Prospect of China's Ship Recycling Industry

China ship recycling industry started in the early 1960s, when the ship recycling industry was not well developed, only dismantling some of the small vessels by manual operation in rough process. In 1970s, in the international market the prices of ships in demolition increase and the government implemented no policies in developing ship recycling industry, so ship recycling companies experienced a difficult period. Early in the 1980s, China ship recycling industry developed with great progress. In 1985 there were about 120 ship recycling site in China with annual dismantling capacity of 2 million tons of light displacement tonnage. However, at the end of the 1980s, due to the rapid increase in the price of international ships in demolition, China ship recycling industry immersed in low tide, and some of the ship recycling yards stopped ship recycling activities. In the early 1990s, the price of ships in demolition in the international market went down again. Meanwhile, China also began to shift from a planned economy to a market economy, the ship recycling industry setting off an upsurge. In 1993, there were more than 140 ship recycling

points, dismantling capacity of 3 million tons of light displacement tonnage. At the same time, China ship recycling industry ranked first in the world. In 1998 China began to implement policies of import tax rebate for recycled ships of ship recycling enterprises approved by China National Shiprecycling Association (CNSA), injecting new vitality into China ship recycling industry. From 2004, the price of ships in demolition in the international market reduced tremendously, domestic steel and scrap price fluctuated greatly, with the international competition by other countries, ship recycling industry dropped into a valley. The China ship recycling industry situation began to turn for the better since 2006, the domestic ship recycling industry began to recover (Zhou, X., 2007). The 2008 financial crisis swept the whole world and China ship recycling industry once again got an opportunity. The dismantling amount of ships in China experienced a great growth. In 2009 ship recycling amount was more than 3.2 million tons of light displacement tonnage, reached the peak of history. While the number of recycled vessels reached 220, ranking second place in the world (He, J. T., 2012).

China ship recycling industry grows in accordance with the "green ship recycling" strategy, mostly shifting to the dry docks or alongside dismantling ways instead of the beach dismantling methods. At the same time, the ship recycling industry has made obvious progress in the dismantling technology, working process, management, environmental protection measures, labour protection and safety and other aspects of the, forming a skilled staff with awareness of safety and environment protection and high technology. At present, Chinese has already formed two major ship recycling bases: the Pearl River Delta and Yangtze River Delta. Chinese ship recycling industry is gradually toward the development direction of standardized, large-scale, and environmentally friendly.

In recent years, China ship recycling industry has strengthened cooperation with the international community. The International Labour Organization, Dutch Iron Slag, the British Oil company, the United States Chevron have come to China to exchange visits, cooperation. In 2001, the ILO held a China Ship Recycling Safety Technology International Seminar in Beijing. In 2002, the China Ministry of Environmental Protection of the Netherlands signed a memorandum of understanding, listing the cleaning demolition of large ship as cooperation projects. In 2012, Germanischer Lloyd signed a memorandum of understanding with CNSA to start cooperation in training and research activities (Zhang, M.M., 2010).

In 2009, IMO adopted 2009 Hong Kong International Safe and environmentally Sound Recycling of Ships Convention in Hong Kong (IMO, 2009). The Hong Kong Convention provides for ship recycling industry with a platform of fair competition, because it has strict regulations on EHS standard. China mode of ship recycling industry basically conforms to the requirements of the ship recycling convention, with both environmental factors of EU mode and low cost factors of India and Pakistan Mode. Under the situation of the relatively steady high supply of ships in demolition, China ship recycling industry is facing a golden opportunity.

However, China ship recycling industry has many problems, such as lack of supervision scrap ship disposal, resulting in a lot of the ship into the hands of illegal ship recycling point and the individual; the dismantling technology and environmental protection level of some ship recycling companies can not fully meet the requirements of the Hong Kong Convention; lack of relevant laws and regulations. The most important and urgent problem is that there is not a complete and comprehensive domestic legal or regulatory system to supervise the scrap ships and EHS of ship recycling.

2.4 Concluding Remarks

With the influence of 2008 recession of world economy, the shipping market will continue a downturn. As a result, there will be plenty supply of the scrapped ships or ships designated for recycling, which will be a great opportunity for China ship recycling industry. On the other hand, China mode of ship recycling has comparative advantage than both the Europe mode and India and Pakistan mode. However, the strict provisions of safety and environment protection about ship recycling of the Hong Kong Convention will supply China with huge challenges. Therefore, the China ship recycling industry will confront both opportunities and challenges. To conduct systematic study of the Hong Kong Convention in addition to other relevant international conventions, comparing with the current domestic legislation and supervision of China on ship recycling, will indentify the disparity between the two systems, which will be of great practical significance for the development of China ship recycling industry.

Chapter III Analysis on the Legislation and Administration of Ship Recycling

3.1 International Regulations of Ship Recycling

Although ship recycling is not a new industry, the regulatory framework for this industry is a relatively new area (Alam, S. & Faruque, A., 2014). Nowadays, there has been increasing international concern regarding the movement of wastes from developed states to developing ones and the negative impact detrimental potential for both the environment and human health as a result of improper handling and disposal of hazardous wastes during the process of ship recycling.

3.1.1 The Basel Convention (BC)

The 'Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989' was completed in the late 1980s and came into force in 1992. The Basel Convention is a very important piece of international law, and it is implemented in Europe by the means of the European Waste Shipment Regulations (EWSR) (Lloyd's Register, 2011).

On 22 September 1995, the Basel Ban Amendment was introduced to deal with what concerns and entails prohibition of all transboundary movements of hazardous wastes, including ships themselves, for 'recycling or recovery' from OECD to non-OECD states. The European Union and its member states (except latecomer Croatia) have all ratified the Ban Amendment, and its principles are implemented in EU law (Yujuico, E., 2014). While this amendment has not come into force, several

countries have ratified it, including the whole of the EU, which means it is law for all EU countries. It is also law for China and Turkey, but not India. This amendment of the Basel Convention stipulates that a ship 'may' be defined as waste because of the hazardous materials it contains (Bhattacharjee, S., 2009). The combination of these two elements, the ban amendment and the definition of a ship as waste, means that you are not allowed to send your ship for recycling in a non-OECD country only if you declare your intention to dispose of a ship, and you are in a port of an OECD country which has ratified the ban amendment.

But the Basel Convention is difficult to implement for ships because it is unlikely that a ship owner would declare an intention to contravene the legislation. What they are increasingly likely to do is to sell the ship to a ship recycling site which may be non-OECD and then let the ship recycling make the declaration in the future.

This Basel Convention is based upon three foundational objectives: minimization of the amount and hazard level of generated wastes; promotion of disposal of wastes as close as possible to the source of generation; "environmentally sound management" and disposal of hazardous waste (Bhattacharjee, S., 2009).

The Convention affirms and institutionalizes the principle of Prior Informed Consent (PIC). Exporting State parties are also obliged under Article 4, (2) (e) to bar an export if it believes that the wastes will not be managed in an environmentally friendly manner. The exporter is also required to prohibit the export of hazardous waste to State parties that have prohibited the importation of such wastes. The Basel Convention also requires the States Parties to introduce appropriate legislation to criminalize and punish illegal traffic.

However, the Basel Convention was not well applied in practice because the regime of Flag State of Convenience (FOC) in which ship owners can avoid restrictive regulatory regimes by changing registration to those FOC countries that have open registries and minimal regulation. This phenomenon can lead to the race-to-bottom competition by ship recycling countries, which have negative effects on adoption of very strict standards for EHS by these countries (Bhattacharjee, S., 2009) because of the principle of "Bad money drives out good money".

3.1.2 The Hong Kong Convention

3.1.2.1 The Background of the Convention

As a response to the gaps in the Basel Convention regime and the request of the Conference of Parties to the Basel Convention, the Marine Environment Protection Committee (MEPC) of the IMO agreed that it should develop "a new mandatory instrument on recycling of ships, with a view to providing legally binding and globally applicable regulations for international shipping and for recycling facilities" (Mikelis, N., 2006). In 2005, the IMO Assembly passed a resolution, requesting the MEPC to develop a mandatory instrument regulating, inter alia, the design, construction and preparation of ships so as to facilitate safe recycling, safe and environmentally sound operation of recycling facilities and establishment of an appropriate enforcement mechanism.

Thereafter, in 2006, the 54 Working Group of the Session of MEPC on ship-recycling drafted the text. The representatives from the International Labor Organization (ILO) and the Basel Convention Secretariat were also included in the Working Group. The text of the Convention was finalized in the 58th Session of

MEPC in October 2008, and adopted during the International Conference of the IMO Member-States in May 2009.

3.1.2.2 The Structure of the Hong Kong Convention

The Hong Kong Convention aims to provide regulations for the design, construction, operation and preparation of ships so as to facilitate safe and environmentally sound recycling (Mikelis, N., 2006), covering "cradle-to-grave" regulation that spans across every aspect of the entire life-cycle of a ship (Bhattacharjee, S., 2009).

The text adopted by the Hong Kong Convention is classified into three main parts: articles, regulations and appendices. It has 21 articles which form the main legal mechanism. The annex contains 25 regulations which form the essential requirements and technical details of the Convention. Figure 3 reveals the main contents of the annex of the Hong Kong Convention, provisions of which are cover the ship builders, owners, operators and ship recycling facilities.

In addition to 21 articles and 25 regulations, the Hong Kong Convention has 7 appendices which are also a part of the annex. These appendices contain a list of hazardous materials, forms and certificates related to the Convention, among other things. The appendices provide a common information base and a consistent format for documentation that will assist in proper implementation of the Convention's procedures.

Beside articles, the annex-regulations and the annex appendices certain guidelines have also been developed and adopted. These guidelines aim to support party states in the early implementation of the technical standards of the Convention. These

guidelines are specifically designed for proper implementation of the requirements of the Convention and its regulations unlike other existing non-mandatory guidelines related to ship recycling developed by ILO, IMO and the Basel Convention. Since these guidelines are authorized by the Hong Kong Convention they have more influence on the key issues of standards on ships and at ship recycling facilities. For example, preparation of the ship recycling plan and the ship recycling facility plan will extensively depend on these guidelines.

3.1.2.3 The Fundamental Advances of the Hong Kong Convention

There are several fundamental advances of the Hong Kong Convention which are of great significance for the ship recycling industry (Bhattacharjee, S., 2009). The Convention not only focuses on the ships but also set requirement for other stakeholders such as flag states, port states, ship recycling facilities.

First of all, this Convention covers "cradle-to-grave" regulation that spans across every aspect of the entire life-cycle of a ship (Bhattacharjee, S., 2009). Thus, it includes regulations for the "design, construction, operation and preparation for ships so as to facilitate safe and environmentally sound recycling, but without compromising their safety and operational efficiency" (Mikelis, N., 2006). It requires both Flag States of ships and Port States to "prohibit and/or restrict the installation and use of hazardous materials listed in Appendix 1 to the Convention" on ships flying their flags or "whilst in their ports, shipyards, ship repair yards or offshore terminals" respectively (Hong Kong Convention, 2009).

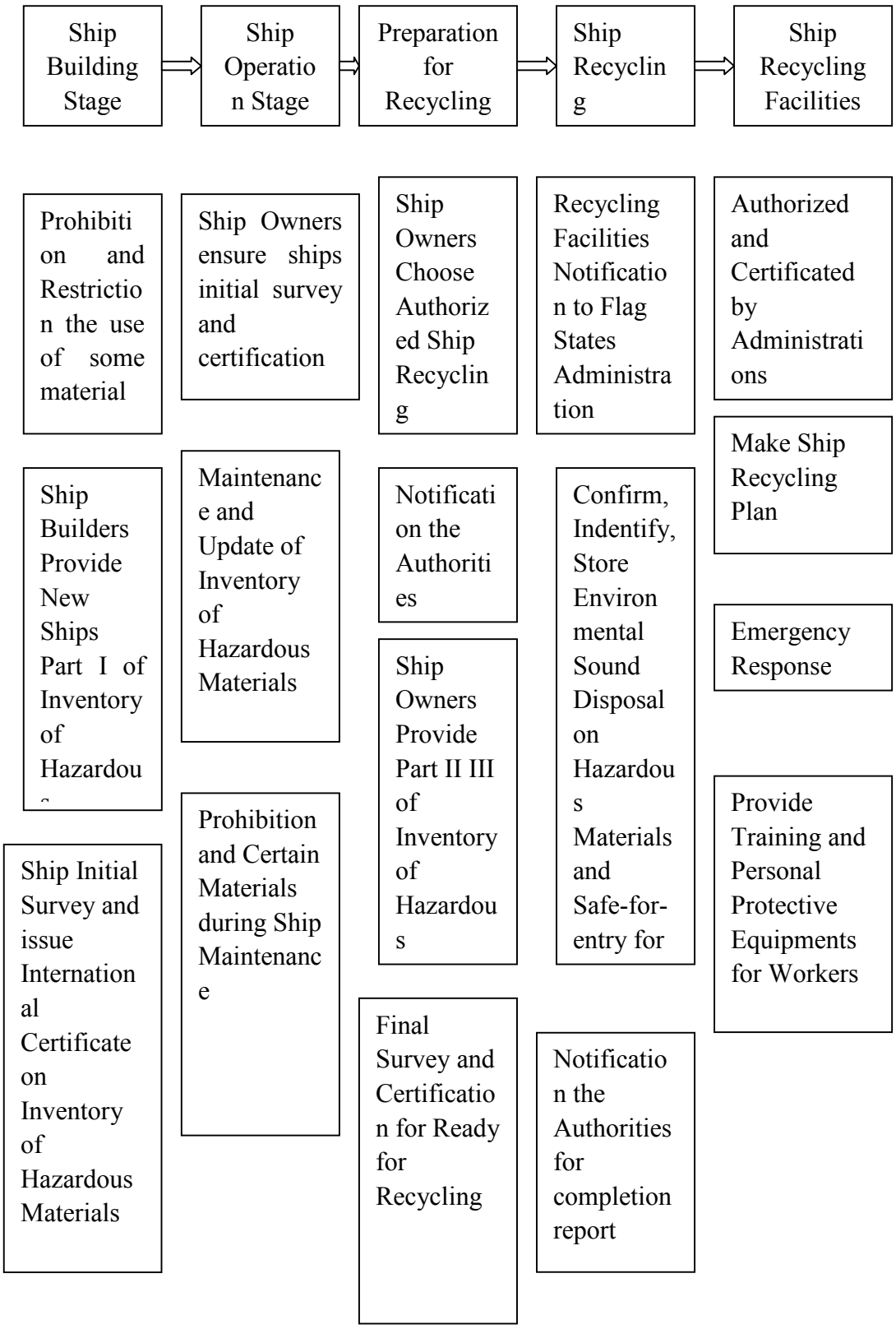
Ship Building Stage
Ship Operation Stage
Preparation for Recycling
Ship Recycling
Ship Recycling Facilities
Prohibition and Restriction the use of some material
Ship Owners ensure ships initial survey and certification
Ship Owners Choose Authorized Ship Recycling
Recycling Facilities Notification to Flag States Administration
Authorized and Certificated by Administrations
Make Ship Recycling Plan
Ship Builders Provide New Ships Part I of Inventory of Hazardou
Maintenance and Update of Inventory of Hazardous Materials
Notification the Authorities
Ship Owners Provide Part II III of Inventory of Hazardous
Confirm, Indentify, Store Environmental Sound Disposal on Hazardous Materials and Safe-for-entry for
Emergency Response
Provide Training and Personal Protective Equipments for Workers
Ship Initial Survey and issue International Certificate on Inventory of Hazardous Materials
Prohibition and Certain Materials during Ship Maintenance
Final Survey and Certification for Ready for Recycling
Notification the Authorities for completion report

Figure 3- The Main Contents of Regulations for Safe and Environmental Sound Recycling of Ships

Source: Yu, H., 2009.

Secondary, another key requirement is the survey, control and enforcement regulations. Every ship shall develop and maintain an "Inventory of Hazardous Materials". This obligation must comply with by each ship throughout its operating life. Every ship has to comply with the survey and certification requirements developed by the Flag State. These include an initial survey before the ship is put in operation and before the issue of the International Certificate on Inventory of Hazardous Materials, a renewal survey at a maximum interval of every five years, a survey after any change, replacement or significant repair of the structure, and a final survey prior to the ship is taken out of service for recycling after an International Ready for Recycling Certificate shall be issued. Figure 3 shows the exact ship recycling process under the Hong Kong Convention, the International ready for Recycling Certificate must be ready before recycling activities. Article 8 of the Convention provides for inspection of ships by Port States. Ships in ports and offshore terminals can be inspected by duly authorized officers. Critically, such inspection is however normally limited to only verifying that there is on board a valid International Certificate on Inventory of Hazardous Materials.

Third, the obligation of parties for authorization of recycling facilities is another important regulation. The Convention also requires prior authorization of every ship recycling facility by its State. Article 6 requires each Party to ensure that ship-recycling facilities operating under its jurisdiction are authorized in accordance with the regulations contained in the Annex. Article 4(2) also imposes a general obligation on the Parties to ensure that the ship recycling facilities comply with the

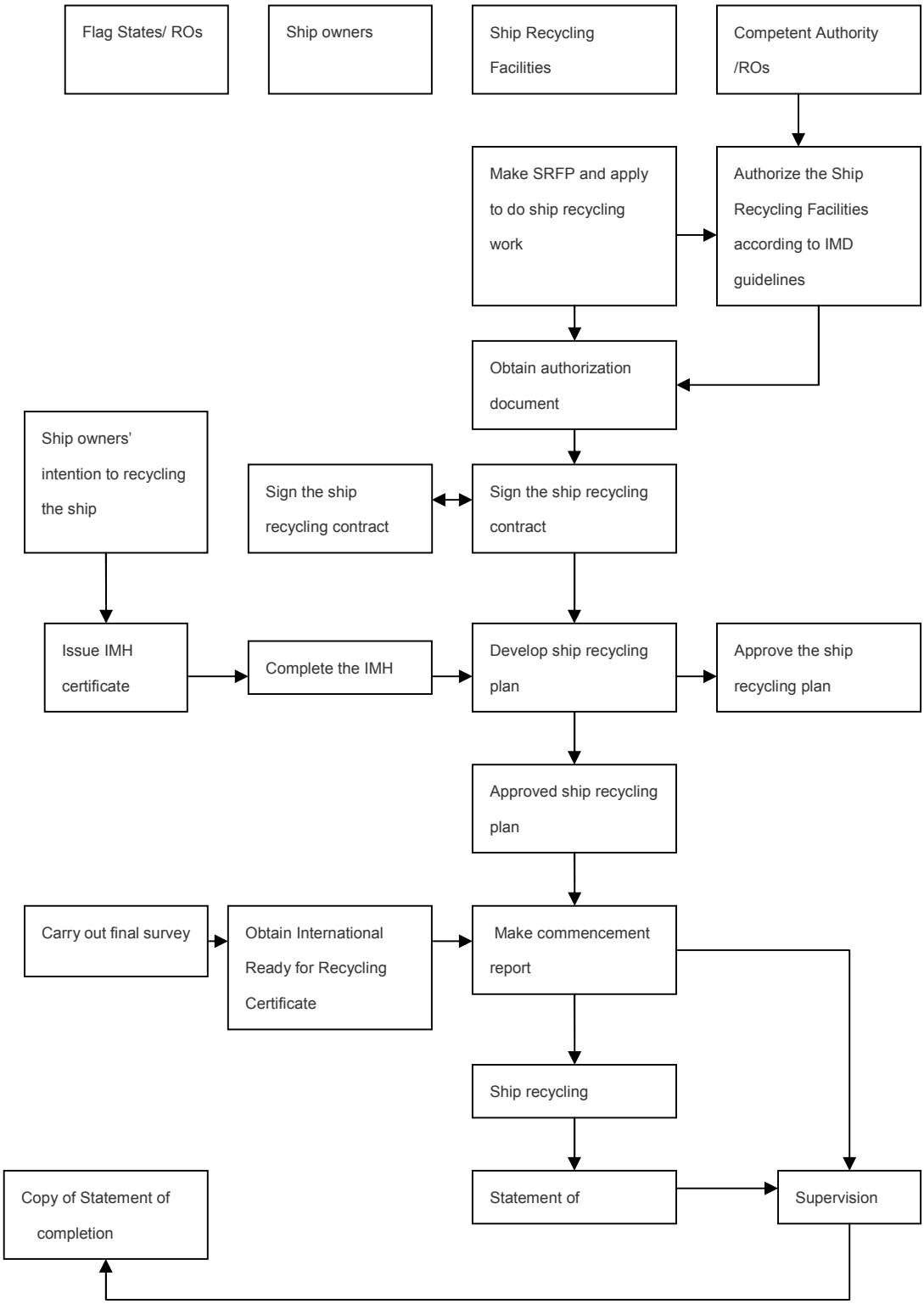
Flag States/ ROs
Ship owners
Ship Recycling Facilities
Competent Authority /ROs
Make SRFP and apply to do ship recycling work
Authorize the Ship Recycling Facilities according to IMD guidelines
Obtain authorization document
Ship owners' intention to recycling the ship
Sign the ship recycling contract
Sign the ship recycling contract
Issue IMH certificate
Complete the IMH
Develop ship recycling plan
Approve the ship recycling plan
Approved ship recycling plan
Carry out final survey
Obtain International Ready for Recycling Certificate
Make commencement report
Ship recycling
Copy of Statement of completion
Statement of
Supervision

Figure 4 Ship Recycling Process under Hong Kong Convention

Source: Zeng, X.M. & Ren, D., 2012.

requirements of the Convention, and shall take effective measures to do so.

Finally, the Hong Kong Convention creates a uniform set of technical standards for ship recycling facilities and procedures as part of the instrument. These standards are interpreted in Regulations contained in Annex. As the analysis in 3.1.1, the Convention is a remarkable progress, which is more useful in practice than the Basel Convention. The core content of the Hong Kong Convention is that: since it is seem impractical to ban transboundary movements of end-of-life ships, it is important to set a minimum standard for ship recycling facilities to low the risk to EHS in ship recycling activities.

3.1.2.4 The Critical Analysis of the Hong Kong

The adoption of the Hong Kong Convention is definitely a milestone forward to deal with health, safety and environmental concerns associated with ship recycling. It is a decent attempt to solve the contradiction between the existing legal instruments and the ship recycling practices. The Convention supply legally binding criteria specifically designed for ship recycling industry which makes the Convention powerful and distinct from other legal regimes and guidelines concern ship recycling (Jain, K. P. et al, 2013). In addition, the Hong Kong Convention will provide a platform of fair competition for ship recycling countries, paving the path for standardization of the ship-breaking process across jurisdictions and is likely to act as a bulwark against the race-to-bottom between various ship-breaking countries (Bhattacharjee, S., 2009).

Every international convention is a product of balance and compromise, though with some deficiencies such as no direct ban of the beaching method, not mentioning the polluter pays principle, the Hong Kong Convention is a commendable attempt towards safe and environmentally sound ship recycling. Unfortunately, the Convention seems not come into force in a short period.

3.1.3 The International Labour Organization (ILO)

ILO, which is responsible for handling ship recycling occupational health and safety problems, has been monitoring and participating in the IMO and Basel Convention in ship recycling aspects. The ship recycling issue was included in the ILO agenda in 1980s, but it was not actively discussed. At the 279th session of the ILO governing body in November 2000, a conclusion was endorsed by the three party conferences on the globalization of transport equipment manufacturing and the impact of labor on the parties. The conclusion required the ILO to prepare a comprehensive code for occupational safety and health according to local conditions, to encourage governments to request ships have inventory of hazardous materials on board that is updated throughout the life of the ship (UNEP, 2002).

In May 2003, ILO adopted *Safety and Health Guidelines (Draft)*, and in March 2004, adopted Safety and Health in the Ship breaking industry: Asian Countries and Turkey for Scrapping. These two documents mainly aimed to a deal with occupational safety and health hazards and the protection of workers in ship recycling in activities.

3.1.4 Other Relevant International Conventions

The Law of the Sea Convention 1982 contains obligations of the States concerning land-based environmental pollution of the sea. According to Article 192, *States have the obligation to protect and preserve the marine environment*. Furthermore, according to Article 194*, States shall take measures to prevent, reduce and control pollution of the marine environment* (UNCLOS, 1982).

Another relevant Convention is the International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001. The Anti-fouling Convention prohibits the use of anti-fouling systems to prevent the harmful substances from being released to the environment (The Anti-fouling Convention, 2001).

3.2 The Europe Attitude

As a major exporter of end-of-life ships to South Asia from the European Union, the European legislation concerning this issue is of crucial importance. The EU followed the footsteps of international convention closely. The European Waste Shipment Regulation 259/93/EEC determines which procedures to apply before waste can be shipped within, into and out of the European Community (European Waste Shipment Regulation, 1993), which is basically based on the Basel Convention (Alam, S. & Faruque, A., 2014). According to the Regulation end-of-life ships are banned to if destined for non-OECD countries. Further more, Regulation (EC) No 1013/2006 of the European Parliament and the Council on Shipments of Waste prohibits the export of hazardous waste from the Community to non-OECD countries was adopted.

Unfortunately, the two regulations were hardly confronted to ship owners for the same reasons as mentioned in 3.1.1 of this thesis.

'A Strategy for better ship dismantling' was adopted by the EU communication in 2009, following the '2007 Green Paper on Better Ship Dismantling', of which the primary goal is to ensure that the EU flag or all ships of European Union should choose worldwide ship recycling facilities that comply with the environmentally sound standard.

In 2013, the Europe Parliament and the Council of Europe Union adopted Regulation No 1257/2013 on Ship Recycling and Mending Regulation (EC) No 1013/2006 and Directive 2009/16/EC. This regulation is mainly based on the Hong Kong Convention, excluding the end-of-life ships should not be subject to Regulation (EC) No 1013/2006(Regulation No 1257/2013 on Ship Recycling, 2013). Therefore, the end-of-life ships can be sent to non-OECD countries for recycling in an environmentally sound manner, which is the same as the Hong Kong Convention.

The adoption of Regulation No 1257/2013 on Ship Recycling is of crucial significance, which is equivalent to the Hong Kong Convention's coming into effect in advance in Europe Union. Based on the establishment of the Hong Kong Convention, the EU Regulation has more strict requirements compared to the Hong Kong Convention, especially in ship recycling facilities. Article 15 and 16 of the Regulation, requires the ship recycling facilities outside of the EU and OECD countries to join the European Union (EU) list of ship recycling facilities, if they want to recycle ships flying EU flags. The on-site inspection and certification must be carried out according to the Regulations. The ship recycling facilities shall not only meet the needs of the Hong Kong Convention, but also meet additional

requirements of the EU regulation, such as the final disposals of the waste generated from recycling process, Article 13 (g) (ii) stipulates, *waste generated from the ship recycling activity and their quantities are documented and are only transferred to waste management facilities, including waste recycling facilities, authorized to deal with their treatment without endangering human health and in an environmentally sound manner*. In a word, the Europe Union Regulation on Ship Recycling in a great move to environmental sound ship recycling and the requirement of European List of Ship Recycling Facilities is actual prohibition of unsafe and harmful methods of ship recycling, such as beaching method.

3.3 Legislations of Shipping Developed Countries

3.3.1 UK Strategy

The Council of Environmental, Food and Rural Affairs, the House of Commons, UK, released a report on the dismantling and retiring ship in Britain in November 2004. The report analyzed the existing ship dismantling of international practice, the implementation of the provisions, and the relevant guidelines of the industry, emphasizing to take action in the domestic and international levels on scrapping. At the same time, the report reviewed the actions taken by the UK in order to improve the standard of scrapping and welcomed the ship breaking strategy of British government (Environment, Food and Rural Affairs Committee, House of Commons, UK, 2004).

In 2005, responding to Environment, Food and Rural Affairs Committee report, considering the lack of international binding regulations to ensure the end-of-life

ships to acceptable environmental, health and safety standards for dismantling, the British government decided to develop a ship recycling strategy.

In 2007, British Department for Environment, Food and Rural Affairs released the British Ship Recycling Strategy (UK Ship Recycling Strategy), consisting of five parts and two annexes provisions. Main part includes policy goals, policy for application in the government possessed ships, the implementation of the provisions of waste transport and guidance to the ship owners to provide, recommendations on the ship recycling facilities and international agenda. Annex1 lists the requirements of recycling facilities in terms of workers health and safety, environment and operation to the minimum standards, Annex 2 is a waste outlet of decision tree.

3.3.2 The United States Legislation

In 2000, the Environmental Protection Agency of the United States released a Guide for Ship Scrappers---Tips for Regulatory Compliance, the objective of which is to enable Ship breaking administration authorities to adopt better supervision for the aspects of environmental protection, worker safety and health of ship recycling operation management. Although the specific operation of the ship dismantling in the ship breaking process often occurs at the same time, the government chooses to make specific requirements for every step of the dismantling operation. In this way, the administration authorities can quickly figure out specific requirements of environmental protection, labour safety and health management, according to the Code of Federal Regulations by identifying ongoing dismantling operation. The guide mainly has specific requirements from seven aspects, including the removal and disposal of the asbestos, polychlorinated biphenyls (PCBs) sampling and processing, bilge and ballast water treatment, cargo oil removal and treatment of

metal recycling and ship equipment (Environmental Protection Agency, United States, 2000).

We can see that the supervision of the United States for ship dismantling is not focusing on the Ship breaking activities, but on pollutants treatments the scrapping process may produce, ensuring every step of the dismantling operation must follow the control of pollutant process according to the requirements proposed. Occupational Safety and Health Administration of US has also developed a relevant specification for the safety and health of workers during the dismantling of the ship. In practice, the specific approval of the ship, the administration authority is the U.S. Maritime Administration.

3.4 Legislation and Supervision in China

China has published numerous ship recycling related laws, administrative regulations, departmental regulations and industry standards. Some of these legal instruments are specifically for ship recycling, some are slightly involved. These laws and regulations constitute the overall framework of the administrative supervision for ship recycling China (Chang, W. & Zhao, Y. L., 2014).

In the aspect of environmental protection, there is the Marine Environment Protection Law and Law of Prevention and Control of Water Pollution，which are supported by the Regulations on Prevention of Pollution of the Marine Environment from Ships 2009, Regulations on Preventing Environmental Pollution from Ship Recycling 1988 and Ship Recycling Supervision and Management Regulations 1990.

In terms of occupational safety, there are Laws on Work Safety, Supervision and Management Regulation on Special Equipment Operators, Regulation on Safety Training on Production and Business Units. Though these laws and regulations are not directly for ship recycling activities, they set requirements on personnel occupational safety of ship recycling operations in general.

In terms of administrative examination and approval, there is the Customs Law, the Regulations on Implementing Import and Export Commodity Inspection 2005, Ship Registration Regulation 1994 and Regulations on Conditions for Maritime Administrative Examination and Approval 2006, including other legal documents, setting up administrative approval for end-of-life ships import approval, registration, inspection etc.

According to the general principles of the effectiveness of the level of laws, laws occupy the highest potency, administrative regulations and departmental regulations are invalid in conflict with laws. The effectiveness of the administrative regulations is higher than that of regulations.

3.4.1 Laws Related to Ship Recycling

3.4.1.1 Marine Environment Protection Law

In 1999, China revised the marine environmental protection Law, which is a special law for marine environment and resources protection. Article 45, 70 and 88 are related to the ship recycling in the marine environment protection. First, Article 45 explicitly prohibited in the industrial production project that do not have effective measures of environment protection in coastal land, including the beaching recycling

method. Secondly, article 70 is about the approval of the marine industrial activities, first item of 6th clearly defined that the ship recycling operations should be submitted to the relevant administration departments for approval. Finally, Article 88 provides penalty for the pollution damage to the marine environment caused by ship recycling operation engaged in water or port, by warning or more than 5 million below 20 million RMB fine (Marine Environment Protection Law, 1999).

3.4.1.2 Law of Prevention and Control of Water Pollution

The law of prevention and control of water pollution is the specialized law for water pollution prevention and control in China, which provides the basic management system and of water pollution control. Article 55 and 80 are the provisions related to the environmental protection in the ship recycling. Article 55 of this law, whoever when take ship dismantling operations in waters, should formulate the corresponding operation plan, and take active and effective pollution control measures. The operation plan shall be submitted to the maritime safety administration of the operating area for approval. While ship dismantling activities happened in fishing ports, the activities should be audited and approved by fishery administrative department. The provisions of Article 88, if not in accordance with the provisions of Article 55, carrying out ship dismantling operation without the examination and approval, the maritime safety administration or the fishery administrative department can take the corresponding administrative penalty measures (Law of Prevention and Control of Water Pollution, 2008).

3.4.2 Administrative Regulations Related to Ship Recycling

3.4.2.1 Regulations on Prevention of Pollution of the Marine Environment from Ships

In 2009, the State Council of China promulgated the Regulations on Prevention of Pollution of the Marine Environment from Ships, chapter 2 of which set requirement of establishment and qualification of ship recycling facilities. Chapter 4, *the prevention and control of pollution related ship activities* provision, has specific requirements for on ship recycling activities, ship recycling site and workers. Chapter 8 the legal liability of pollution damage caused by ship recycling operations (Regulations on Prevention of Pollution of the Marine Environment from Ships, 2009).

3.4.2.2 Regulations on Preventing Environmental Pollution from Ship Recycling

In 1988, the State Council of China promulgated Regulations on Preventing Environmental Pollution from Ship Recycling, which is so far the earliest of norms of the administrative regulations for ship recycling industry in China. Despite the promulgation 21 years ago, it also has very important significance at present. The regulation has 28 articles, which contains: the definition of ship recycling in waters or on land; the competent department of environmental protection for ship recycling； recycling facilities location and setting; ship recycling activities control; treatment for ship recycling pollution and pollution liability.

3.4.3 Other Relevant Department Regulations and Industry Standards

3.4.3.1 Regulation for Fixed Point Ship Recycling

On March 1, 2011, China Maritime Safety Administration issued Regulation for Fixed Point Ship Recycling, which first induces the basic requirements of the Hong Kong Convention. The regulation requires that ships must be recycled in approved recycling sites, meanwhile, providing the specific details for the applications by ship recycling facilities. It is the first step for China to implement the Hong Kong Convention, which is of great significance.

3.4.3.1 Regulations on Old Ship Management

According to the 2009 revised Regulations on Old Ship Management, China has currently implemented mandatory scrap retirement. Old ships should be scrapped according to the age of the ship complying with provisions of the regulation. The ship owners will be liable if they continue to operate ships that should be scrapped compulsorily. The regulation has only provisions on imported scrapped ships, with no provisions on domestic scrapped ships on where these ships will go and be recycled.

3.4.3.3 Green Ship Recycling General Regulation

The China National Development and Reform Commission in 2005 released and implemented first ship recycling industry standards: Green Ship Recycling General Regulation. The main contents are as follows: basic terms and definitions, environmental protection requirements, safety production requirements, occupational health and safety requirements, accident prevention and emergency measures brigade, requirements on ship recycling management and requirements green ship recycling facilities recognition.

3.5 Concluding Remarks

This chapter analyzes the worldwide legislation concerning about ship recycling to identify two main issues: one is that concern of the international legislation and supervision on ship recycling has been shifting from the control of transboundary movements of scrapped ships (proved ineffective in practice) to the management of ship recycling; the other one is that the new legislation focuses on the safety and environment protection issues of ship recycling from cradle to grave of ships. The China domestic legislation has been studied in detail, too.

Chapter IV Defects of China's Legislation and Supervision on Ship Recycling Industry

Traditional ship recycling supervision system mainly focuses on recycling facilities setting, safety and pollution control of ship recycling process, treatment of ship recycling pollutants generated in process, with little attention to ship scrapped supervision and end-of-life import and export. In fact, after the establishment of world ship recycling market, it is very common in both developed and developing countries to import and export scrap ships for the purpose of recycling. The Ship scrapped - Import and export of scrapped ships- Ship Recycling has formed a complete, closely linked process (Zhang, M.M., 2010, p.14). To strengthen the supervision of import and export of the scrapped and ban the scrapped ships from flowing into substandard of recycling facilities, can eliminate risks for occupational safety and environmental pollution caused by ship recycling from the source effectively.

A reasonable ship recycling supervision legislation should mainly include ship scrapped regulations, scrapped import and export supervision regulations and ship recycling safety and pollution prevention supervision regulations. This chapter will compare China current domestic laws and regulations with the relevant international conventions and guidelines, analyzing the defects and shortcomings existing in current China ship dismantling supervision legal system.

4.1 Lack of Provisions on Scrapped Ships Disposal Supervision

To strengthen the supervision of the ship scrapped and track scrap ships flow can effectively avoid the scrapped ship illegal or substandard demolition sites, to not only guarantee that the approved ship recycling facilities have enough scrapped ships, but also that the ships are to be recycled in a harmless, environmental, safe and healthy way.

Article 8, Annex of the Hong Kong Convention, has made 3 control mechanisms to prohibit ships recycled in substandard recycling facilities: certification mechanism for scrapped ships, targeted ships recycled mechanism and report mechanism. That is to say, the Convention requires ships destined to be recycled shall be surveyed and certified before being recycled at ship recycling facilities that are authorized in accordance with this Convention. Meanwhile, the ship owners and ship recycling facilities must make the initial notification and statement of completion respectively.

Although China has implemented clearly the compulsory system for scrapping ships by 2009 revised Regulation on Old Ship Management, there are no clear mandatory provisions on ship scrapped disposal. In such situation, scrapped ships can not be tracked legally, which leads to the phenomenon that the some scrapped ships are assembled, renovated, refurbished again before put into shipping market, sold to be recycled in illegally or substandard ship recycling sites.

4.2 Update of Supervision on Import and Export Scrapped Ships

The Hong Kong Convention has strict regulations for ships before they are sent to be recycled: 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 regulation International Ready for Recycling Certificate.

China treats import and export of scrapped ships as a general type of raw materials of solid waste and applies general regulation instead of implementing a special regulation. Due to the particularity of the scrapped ships, some concrete problems can not find the answers in practice from the available solid waste as raw materials import and export supervision regulation.

4.3 Supervision on Safety and Environmental Sound of Ship Recycling

Under the Hong Kong Convention, supervision authorities for the safe and environmentally sound recycling include the flag states, government competent authorities where recycling facilities and other States parties and by the authorized officers. Compared with the Convention, China involves the ship dismantling laws and regulations is not perfect, the lack of relevant technical standards and compliance with the implementation mechanism of the Convention.

4.3.1 Overlaps in Supervision Authorities in Safety and Environmental Sound of Ship Recycling

Since the reform of the administration authorities in China paid much attention to the authorization of the new authorities, the revocation of the original authorities and

their related functions were neglected, which has resulted in the overlaps in certain areas of environment protection of ship recycling. At the same time, too much emphasis on administrative division regional and watershed division has resulted in overlap between obligations on safety and anti pollution supervision. For example, Regulations on Preventing Environmental Pollution from Ship Recycling 1988, provides that the environmental protection departments of the governments at or above the county level are in charge of ship recycling environmental protection work, and authorize Maritime Safety Administration to assist the supervision of environmental protection departments in the waters outside of port areas; After authorizing Maritime Safety Administration, Fishery Supervision Department, Environmental Protection Department of the Army and State Oceanic Administration to implement supervision in pollution caused by ship recycling, the Regulation also authorize the environmental protection department of governments at or above the county level to organize coordination and supervise environment protection in ship recycling industry. It is difficult to form a unified and effective management system because of the set of overlapping mechanism.

4.3.2 Uncoordinated Situation between Existing Legislation

As a special law，Regulations on Preventing Environmental Pollution from Ship Recycling 1988, was established in 1988. After that, China has issued a series of higher-level laws, such as Regulations on Prevention of Pollution of the Marine Environment from Ships 2009, Marine Environment Protection Law 1999, resulting in uncoordinated situation between the existing legislation. Article 6， Regulations on Preventing Environmental Pollution from Ship Recycling 1988, provides that the ship recycling facilities must prepare an environmental impact report, and submit for approval to the relevant environmental protection department；the environmental

protection department shall solicit opinions from the relevant departments before approving the report. However, Article 29, Regulations on Prevention of Pollution of the Marine Environment from Ships 2009, stipulates that Maritime Safety Administration shall determine and public the locations of shipbuilding, ship recycling facilities after asking for the local environmental protection departments and Marine Departments' opinions.

On the other hand, provisions on the prevention and control of ship recycling pollution are scattered in different laws and regulations, which are different in specifications for the prevention of pollution from ship recycling, lacking of legal norms of proper logic. For example, weather it must need pre-treatment in before ship recycling is different in different regulations. The requirements in different regulations cause conflicts and confusion in ships recycling practice, which leads to the unsatisfactory implementation effect of pollution prevention and control measures.

4.3.3 Lack of Provisions on Management on Inventory of Hazardous Materials and Survey and Certification

The Hong Kong Convention requires that ship owners shall maintain and update the Inventory of Hazardous Materials on board throughout the design, construction and operation until the ships are designated for recycling (The Hong Kong Convention, 2009). The Inventory of Hazardous Materials is a vital innovation by the Hong Kong Convention, which can effectively reduce the potential risk for environment and occupational health and safety during the ship recycling process.

There are no relevant provisions on Inventory of Hazardous Materials in China laws. Article 8, in Regulation on Preventing Environmental Pollution from Ship Recycling 1988, provides that the ship owner of scrapped ship before the handover, shall submit to the competent authorities a report on scrapped ship pollution material. But the content of the report is relatively simple, mainly includes the existing oil sewage quantity; what kinds of cargo of the last voyage; what kinds of treatment the cargo hold has experienced (Regulation on Preventing Environmental Pollution from Ship Recycling, 1988). And the Green Ship Recycling General Regulation 2005, Item 4 of Article 2 requires ship recycling facilities shall enterprise shall obtain the following information of environmental protection before recycling the ship: (1) the main uses before of scrapped ships; (2) whether the scrapped ship has loaded dangerous cargo; (3) whether the ship has loaded radioactive substances or polluted by radioactive cargo; (4) hazardous waste list, quantity and location, that contained in ship's structure or equipment etc. Although similar provisions exist in current laws, it is only for the ship owner to list the harmful materials that exist on the ship before recycling, which is far from the requirements of the Hong Kong Convention. Due to the regular change of the ship owners during operation, the last ship owner is unable to grasp all the hazardous materials that have been installed on board in the process of the operation.

Ship survey and certification and inventory of hazardous materials onboard ships are closely linked. The main contents of the survey of the ships is to confirm the effectiveness of inventory of hazardous materials, while the certification is recognition of results of ship survey. The Annex of the Hong Kong Convention specifies comprehensive survey requirements to ships, including the initial survey, regular survey, additional survey and final survey. Due to the lack of the legal

provisions of the inventory of hazardous materials, the ship survey and certification mechanism can not be carried out in the corresponding process.

4.3.4 Some Defects on Supervision on Ship Recycling Facilities

4.3.4.1 Approval Procedure

Regulations on Preventing Environmental Pollution from Ship Recycling 1988 and Ship Recycling Supervision and Management Regulations 1990 have provisions on the approval and inspection ship recycling facilities. According to the provisions of laws and regulations, in practice the established of China ship recycling facilities must be approved by the local governments. Ship recycling facilities must prepare an environmental impact assessment report and submit to the local environmental protection department. The local environmental protection departments shall seek the opinions of the maritime safety administrations before approving the report.

At present, China has established the approval system for ship recycling facilities, but there are many problems in the specific inspection and approval in practice.

First, the approval authorities are not well defined. According to the laws and regulations above: the local governments are in charge of the inspection of ship recycling facilities location; environmental protection departments censor and approve the preparation of environmental impact report of ship recycling facilities; other departments offer advice on the ship recycling facilities settings, but no provisions for the authorities to issue the final approval. There are not any corresponding provisions of specific conditions relating to issuing, amending, suspending, withdrawing and renewing the document of authorization to conduct

Ship Recycling (The Hong Kong Convention, 2009) that required by the Hong Kong Convention.

Then, for inspection and approval for setting up ship recycling facilities, there are only provisions for documents review, with no provisions for site inspection.

Furthermore, the documents review is limited on environmental impact report with lacks contents of design analysis of rationality, personnel qualification, management system within ship recycling facilities.

4.3.4.2 Management on Ship Recycling Facilities Plan

Article 18, Annex of the Hong Kong Convention provides that Ship Recycling Facilities shall prepare a Ship Recycling Facility Plan. The Plan shall be adopted by the board or the appropriate governing body of the Recycling Company, and shall content a policy ensuring workers' safety and the protection of human health and the environment, a system for ensuring implementation of the requirements set out in this Convention a program for providing appropriate information and training of workers for the safe and environmentally sound operation of the Ship Recycling Facilities; a system for monitoring the performance of Ship Recycling; a system for reporting occupational diseases, accidents, injuries and other adverse effects on workers' safety and human health, a system for reporting discharges, emissions, incidents and accidents causing damage, or with the potential of causing damage, to workers' safety, human health and the environment (The Hong Kong Convention, 2009). There are no provisions on Ship Recycling Facilities Plan in China legislation.

4.3.4.3 Safe and environmentally sound management of Hazardous Materials

As mentioned in 3.1.2.3 of this thesis, the Hong Kong Convention creates a uniform set of technical standards for ship recycling facilities and procedures as part of the instrument. These standards are interpreted in Regulations contained in Annex. Such as in Item 2 Article 20, Ship Recycling Facilities authorized by a Party shall ensure that all Hazardous Materials detailed in the Inventory are identified, labeled, packaged and removed to the maximum extent possible prior to cutting by properly trained and equipped workers, taking into account the guidelines developed by the Organization. On the other hand, Regulation on Ship Recycling of Europe Union provide the final disposals of the waste generated from recycling process are documented and are only transferred to waste management facilities, including waste recycling facilities, authorized to deal with their treatment without endangering human health and in an environmentally sound manner (Regulation No 1257/2013 on Ship Recycling, 2013).

But there are no relevant technical standards, which leads to the lack of clear legal basis and technical standards when competent authorities implement supervision in such areas.

4.3.4.4 Report System

Annex of the Hong Kong Convention provides mandatory reporting requirements including the initial report and the completion report. China only stipulates that ship recycling unit or individual shall report to competent authorities in the case of the ship recycling pollution accidents, which are defined in Article 15, Regulations on Preventing Environmental Pollution from Ship Recycling 1988 and Article 23, Ship Recycling Supervision and Management Regulations 1990.

There are no corresponding provisions for the initial report completion report required by the Hong Kong Convention. Because of high risk and high pollution of ship recycling operations, the supervision must be based on prevention in advance. Therefore, according to the requirements of the Convention, China should require ship facilities to carry out compulsory reports before and after the recycling.

4.4 Concluding Remarks

This chapter lists the defects in China's domestic legislation and supervision on ship recycling mainly based on the Hong Kong Convention, from supervision on scrapped ships disposal, import and export scrapped ships to the safety and environmental sound of ship recycling, which provides direction for the legislative proposal.

Chapter V Suggestions and Legislation Proposals for China

Due to the effort to advocate green ship recycling in China, the legislation relevant to ship recycling is consistent with China Mode of Ship Recycling Industry. But compared to the Hong Kong Convention and Europe Union Regulation on Ship Recycling, the legislation and supervision and in China need to be improve to cope with the global growing safety and environmental protection concerns. The Hong Kong Convention provides the opportunity to improve China ship recycling relevant legislation and supervision system.

Article 15, the annex of the Hong Kong Convention, *each Party shall establish legislation, regulations, and standards that are necessary to ensure that Ship Recycling Facilities are designed, constructed, and operated in a safe and environmentally sound manner in accordance with the regulations of this Convention.* That is to say the Parties shall make laws, regulations and technical standards complying with the Hong Kong Convention or its guidelines to implement the relevant requirements of the Convention (Gai, X.Z., 2015). China should strengthen the research of domestic legislation for the Hong Kong Convention, combining advanced and creative ideas of the convention with the reality of China, to prepare for the implementation of the Hong Kong Convention. According to the content and requirements of the Hong Kong convention, the most important thing is to amend, adjust or create the national laws or regulations of the Parties.

Through the analysis of the defects in the legal system of the ship recycling supervision in China, the author believes China should improve the supervision and supervision system of the ship recycling from the following aspects:

5.1 Define the Obligation for Each Competent Authority

Article 2, the Hong Kong Convention, defines two authorities: the Government of the State whose flag the ship is entitled to fly, or under whose authority it is operating; the second is competent authorities, namely a state parties specified in the country that appropriate means a governmental authority or authorities designated by a Party as responsible, within specified geographical area(s) or area(s) of expertise, for duties related to Ship Recycling Facilities operating within the jurisdiction of that Party as specified in the Convention. The former is mainly responsible for survey, inspection ships, and issuing International Certificates on Inventory of Hazardous and Materials International Ready for Recycling Certificate. While the latter ones mainly supervise the ship recycling facilities, and issue authorization to recycling facilities that meet the requirements of the Convention.

Therefore, the author suggests that China shall define the obligation of competent authorities to realize the integration with the Hong Kong Convention, establishing ship recycling pollution prevention and supervision system. China MSA is responsible for merchant ships' survey and certification; the fishery management departments are in charge of fishing vessels' survey and certification; the environmental protection departments are in charge approval and authorization of ship recycling facilities. Improve existing areas or regions supervising authorities system so as to avoid overlapping phenomenon in supervising the ship recycling. The survey, certification and inspection mechanism which is independent from the

supervision on ship recycling activities can control the ships from the construction, operation and recycling process more effectively (Zhou, B., 2010).

5.2 Establish Provisions on Scrapped Ships Imported and Disposal Supervision

China should improve the legislation to define duties of various supervision departments for the scrapped ships imports： the environmental protection departments are responsible for the approval of import scrapped ships imports file; the customs is in charge of importing scrapped ships clearance procedures according to the relevant approval documents; the administration of quality supervision, inspection and quarantine agencies strengthen quarantine and supervision on scrapped ships import. All the relevant authorities should determine the qualifications of the scrapped ships imports according to whether the ship recycling facilities have been authorized by the environmental protection department and monitor the flow of scrapped ships, preventing the inflow into illegal dismantling channels.

China shall also amend the Regulations on Old Ship Management 2009, and supplement the provisions on the sale and purchase of scrapped ships to strictly control the flow of scrapped ships. The legislation shall require the ship owners to indicate the ship quasi ship recycling facilities in the initial reports that must have obtained the authorization. If anyone violates the above provisions, there will be penalties for both the ship owners and no qualified ship recycling facilities who shall undertake pollution damage and casualties compensation caused by ship recycling operations

5.3 Establish Management Mechanism on Inventory of Hazardous Materials and Survey and Certification

China should in domestic legislation make corresponding provisions on Inventory of Hazardous Materials according to the Hong Kong Convention, requiring the ship owners to have Inventory of Hazardous Materials onboard and keep it update. Meanwhile, the relevant domestic legislation should also gives the approval, supervision and inspection rights to the environmental protection department, the maritime safety administration and the survey authority. In addition, the relevant domestic legislation should provide the legal liability consequences for the ship owners who violate the relevant hazardous materials control provisions, to ensure the effective implementation of laws and regulations.

After the establishment of management mechanism on Inventory of Hazardous Materials, China should correspondingly authorize the China MSA or its Recognized Organizations to carry out the survey certification for hazardous materials installation during the whole life cycle of the ship. The survey should include initial, periodical, additional and final survey in accordance with the Hong Kong Convention. China MSA should also be authorized to carry out Flag State or Port State inspections to ensure the validity Inventory of Hazardous Materials onboard ships.

5.4 Adjust the Technical Standards and Enforcement Measures

China Domestic legislation should adjust and amend technical standards such as Green Ship Recycling General Regulation 2005 according to the Hong Kong Convention and its guidelines, such as Guidelines for the Authorization of Ship Recycling Facilities (IMO, 2012), to ensure implementation and operation of the

stakeholders such as supervision authorities, ship owners, ship recycling facilities, have a clear and specific basis.

Article 10.2, the Hong Kong Convention, *the sanctions provided for by the laws of a Party pursuant to this Article shall be adequate in severity to discourage violations of this Convention wherever they occur.* Therefore, the domestic legislation should define the legal liability for each stakeholder as well as sanction provisions to ensure the enforcement. On one hand, the clear legal liability sanction provisions can make ship recycling supervision authorities' administrative law enforcement strictly in accordance with the laws and regulations. On the other hand, it can also make cost of ship recycling facilities' violation of the law higher than cost of their compliance.

5.5 Adjust the Management Mechanism on Ship Recycling Facilities

5.5.1Define the Approving Procedure for Ship Recycling Facilities

China domestic legislation should establish mechanism on examination and approval of setting up for ship recycling facilities. The first step is to define the environmental protection departments to issue the final approval certificate as is mentioned in Chapter 5.1. The mechanism should add on-site inspections according to the Hong Kong Convention on the basis of document review. On the other hand, the document review should contain design analysis of rationality, personnel qualification, and management system within ship recycling facilities. After confirming that ship recycling facilities are in line with the conventions and domestic laws and regulations requirements, the competent authority can issue the approval certificate.

After the issuance of the approval certificate the competent authority should carry out regular inspection to ensure the ship recycling facilities adhere to the safe and environmentally sound recycling of ships within the period of validity of the certificate. If the ship recycling facilities no longer meet the corresponding requirements, the competent authority shall withdraw the approval certificate or order them to take corrective actions.

5.5.2 The Management on Ship Recycling Plan

China domestic legislation should stipulate that ship recycling facilities shall develop ship recycling plans that must be adopted by the board or the appropriate governing body of the Recycling Company: to ensure the safety of workers and management personnel of health protection and environmental protection；to reduce the harmful effects caused by the establishment of ship recycling operation; to establish accident prevention mechanism, to ensure that in the process of Safe-for-hot work operations; to prevent spill of residue ship and other harmful substances; to identify, pack remove, and place separately harmful material and wastes and in order to ensure its safety and environment ultimately harmless way of disposal; to establish emergency response plan to ensure the availability of appropriate equipment and procedures, and carry out regular exercise; to train workers to make them be familiar with the necessary safety knowledge, safety rules and regulations.

5.5.3 Set up System of Report

According to the provisions in the Convention Hong Kong, China domestic legislation should provide that an initial report that main content is Inventory of Hazardous Materials and ship recycling plan should be submitted to the competent authorities by ship recycling facilities, which will help competent authorities take appropriate supervisory measures in time. After the recycling of ships, the ship

recycling facilities should submit to the competent authority a completion report, which reveals whether there have happened incidents that harm occupational health or the environment during recycling operation.

5.6 Concluding Remarks

This chapter gives the suggestions and legislative proposals for China in ship recycling. In addition, some measures such as technical standards and enforcement have been mentioned.

Chapter VI Summary and Conclusions

With the downturn of world economy, ship recycling market's prosperity will continue. The adoption of the Hong Kong Convention and the Regulation on Ship Recycling of European Union (EU) will accelerate the change of supervision from the control of transboundary of scrapped ships (which has been proved a failure because of FOC mechanism and other reasons) to ships' operation process control and ship recycling management. As the first mandatory international legal instrument to solve ship recycling issues, the Hong Kong Convention will curb vicious race-to-bottom competition in ship recycling industry effectively, providing a platform for fair play for the world ship recycling industry. The implementation of the Hong Kong Convention will be bound for Parties to work together to strengthen the supervision of the ship recycling industry, reducing harm to environment and OHS by the industry, which will lay a solid foundation for the sustainable development of the global shipping industry.

But the defects in China domestic legislation compared to the Hong Kong Convention in ship recycling, will block the development of its ship recycling industry and also bring brings a lot of safety and environmental pollution risks at the same time.

As an important shipping and ship recycling nation, China should adopt the advanced concept of the Hong Kong Convention and EU Regulation on Ship Recycling, complying with domestic ship recycling practice, to improve the legislation and supervision system on ship recycling. The competent authorities in China should also,

according to the requirements of the Hong Kong Convention and other relevant guidelines, take these measures: modify and adjust the relevant laws and regulations; formulate corresponding technical standards; establish execution mechanism in line with the requirements of the convention to comprehensively strengthen the supervision on ships and ship recycling facilities; defining legal pollution liability of ship recycling facilities and sanctions, to promote the safe, environmentally sound and sustainable development of China ship recycling industry.

Reference

Alam, S. & Faruque, A. (2014). Legal regulation of the Shipbreaking Industry in Bangladesh: The international regulatory framework and Domestic Implementation challenges. *Marine Policy, 47 (2014),* 46–56.

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, UNEP, Geneva, 1989.

Bhattacharjee, S. (2009). From Basel to Hong Kong: international environmental regulation of ship-recycling takes one step forward and two steps back. *Trade Law and Development 2009,1(2).*193–230.

Chang, W. & Zhao, Y. L. (2014). Current situation of Chinese Shi p Recycling Convention Legislation and Implementation Proposal. *China Maritime Safety, 2014(6),* 27-30.

Green Ship Recycling General Regulation, 2005. China National Development and Reform Commission, (2005)

Customs Law of the People's Republic of China on Work Safety, 1987. China, (1987).

Environment, Food and Rural Affairs Committee, House of Commons, UK. (2004). Dismantling Defunct Ships in the 18th Report of Session 2003-2004, London, UK.

Environmental Protection Agency, United States．(2000). A Guide for Ship Scrappers--"Tips for Regulatory Compliance．EPA315.B.00 一 001, p. 1—2．

Gai, X.Z. (2015). Legislation and Mechanism: Instruments to Effectively Play the Role of Competent Authorities under Hong Kong Convention. Unpublished Thesis, World Maritime University.

Green Ship Recycling General Regulation, 2005, China National Development and Reform Commission,(2005)

He, J.T. (2012). Development countermeasures of China's ship-breaking industry. *Journal of Dalian Maritime University (Social Sciences Edition),2012(2).* 9-12.

Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships 2009, IMO, 2009.

ICRA. (2012). Ship Breaking Industry: Key Trends and Credit Implications.

International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001. International Maritime Organization, 2001, London, UK.

International Federation for Human Rights. (FIDH). (2002). Where Do “Floating Dustbins” End Up ? In Labor Rights in Ship Breaking Yards in South Asia, the Cases of Chittagong (Bangladesh) and Alang (Indian) (No.348/pp.84).Paris: Author.

International Maritime Organization. (2005). Amendments to the IMO Guidelines on Ship Recycling. A980(24). London.

International Maritime Organization. (2006). Implementation of IMO Guidelines on Ship Recycling.A962(23). London.

International Maritime Organization.(2012). Guidelines for the Authorization of Ship Recycling Facilities. IMO Res. MEPC.211 (63). IMO, London.

Jain, K. P. et al. (2013). Critical Analysis of the Hong Kong International Convention on Ship Recycling. *International Scholarly and Scientific Research & Innovation, 7(10) 2013,*438-446.

Law of Prevention and Control of Water Pollution of People's Republic of China, 2008, China, (2008).

Law of the People's Republic of China on Work Safety, 2002. China, (2002)

Lloyd's Register. (2011).Ship Recycling: Practice and Regulation Today. London, UK. Retrieved 15 March 2015 from the World Wide Web: http://www.shipbreakingbd.info/report/ShipRecycling_Lloyds%20Register.pdf

Marine Environment Protection Law of the People's Republic of China, 1999, China, (1999).

M. Stopford, Maritime Economics. London: Routledge, 2009, chapter. 5, at p.178.

Nikos Mikelis. (2006). Developments and Issues on Recycling of Ships, Paper presented at the East Asian Seas Congress. Retrieved 15 May 2015 from the World Wide Web: http://www.imo.org/includes/blastDataOnly.asp/data_id%3D17980/Developments.pdf

Ravichandran, K. et al. (2012). Ship Breaking Industry: Key Trends and Credit Implications. ICRA Rating Service Report.

Regulation 259/93/EEC of 1 February 1993 on the Supervision and Control of Shipments of Waste within, into and out of the European Community, as Amended, 1993.

Regulation (EC) No 1013/2006 of the European Parliament and the Council on Shipments of Waste, 2006.

Regulation No 1257/2013 on Ship Recycling and Mending Regulation (EC) No 1013/2006, 2013.

Regulation of the People's Republic of China for Fixed Point Ship Recycling 2011, China Maritime Safety Administration, (2011).

Regulations of the People's Republic of China on Conditions for Maritime Administrative Examination and Approval, 2006, Ministry of Communications, the People's Republic of China,(2006).

Regulations of the People's Republic of China on Implementing Import and Export Commodity Inspection, 2005, State Council of the People's Republic of China, (2005).

Regulations of the People's Republic of China on Old Ship Management, 2009 revised, Ministry of Communications, the People's Republic of China, (2009).

Regulations of the People's Republic of China on Preventing Environmental Pollution from Ship Recycling, 1988, State Council of the People's Republic of China, (1988).

Regulations on Prevention of Pollution of the Marine Environment from Ships of People's Republic of China, 2009, State Council, (2009).

Ship Registration Regulation of the People's Republic of China, 1994, State Council of the People's Republic of China, (1994).

Ship Recycling Supervision and Management Regulations, 1990, Ministry of Communications, the People's Republic of China, (1990).

Supervision and Management Regulation on Special Equipment Operators, 2009, State Council of the People's Republic of China, (2009).

United Nations Environment Program. (2002).Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships. UNEP/CHW.6/23.

UN Convention on the Law of the Sea, 1982. United Nations, (1982).

Wang, B.(2009). The Green Convention of China's Ship-breaking Industry. *Resource Recycling. 2009(10),* p. 14-15.

World Bank. (2010). Ship Breaking and Recycling Industry in Bangladesh and Pakistan. Report No 58275-SAS. World Bank, Washington DC.

Yu, H., (2009). Discussion on the Influence of the Implementation of the Hong Kong Convention for China's Maritime Administration. In *2009 Activity Academic Month of Young Scientists of Both Sides of the Taiwan Straits – The Prevention and Control of Marine Pollution and Emergency Technology Seminar:* Beijing, China: China Association of Science and Technology.

Yujuico, E. (2014). Demander pays: The EU and funding improvements in South Asian ship recycling practices. *Transportation Research Part A, 67(2014).* p.340–351.

Zeng, X.M. & Ren, D. (2012). Legal Obligation from Ship recycling Convention and the Risk Analysis. *Navigation of China, 35(2),* 94-96.

Zhang, M.M. (2010). The Defect an Improvement of China Ship Recycling Relevant Legislation and Administration. Unpublished master's thesis, Dalian Maritime University, Dalian, China.

Zhou, B. (2010). Study on the Legal Issues related to Prevention of Pollution of the Environment in Ship recycling. Unpublished master's thesis, Dalian Maritime University. Dalian, China.

Zhou, J. (2009). The Influence of 2009 Hong Kong on Ship Recycling Mode. *Marine Equipment/Materials & Marketing. 2009(3),* p.21-23.

Zhou, X. (2007). Review of Current Situation and Future Development of China Ship Recycling Industry. *China Water Transport. 2007(10),* 17-19.