

Study on status quo of shipbreaking sector and strategies

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Abstract. In recent years, the quantity of broken obsolete vessels tends to rise year by year in the shipbreaking sector, but breaking down obsolete vessels is one of vessel operations with high pollution and high risk, involving proper disposal of hazardous substances, bulge discarded oils and other materials, and thus causing great danger and harm. In this paper the author investigates mainly the status quo of the shipbreaking sector, comes up with the “green-shipbreaking” concept, analyzes main problems currently present in the shipbreaking sector and presents proper strategies and recommendations to deal with them.

1. The Status Quo of Shipbreaking Sector

So far, most scrapping plants across the world have been concentrated in four Asian countries: Bangladesh, India, China and Pakistan, the total tonnage of vessels dismantled by these four countries accounting for 85 % of the world's total tonnage, and some plants have stood in Turkey which is situated in the Mediterranean region and connects Europe and Asia.

Ever since 1983 when the shipbreaking sector of China began to get policy support of the government, the nation has implemented policies about exemption from tariff, and industrial & commercial (consolidated) taxes and interest-free preference, and appropriated, every year, a certain preferential amount of foreign exchange and proper working funds to shipbreaking companies to purchase and import obsolete vessels for scrapping, and steel scraps broken down have been sent to steel plants by the nation. Furthermore, the nation has enacted the policy to provide a favorable interest rate, for instance, any enterprise scrapping vessels less than 10,000 light displacement tons (LDTs) will be exempted from interest for 6 months and those scrapping vessels more than 10,000 LDTs will be exempted from interest for 10 months.

Since 2003, with recovery of the shipping industry across the world, the price of obsolete vessels has surged internationally from around USD\$ 90/LDT to USD\$ 350/LDT at the beginning of 2006. As of the first half of 2008, the price of obsolete vessels rose unbelievably to USD\$ 700/LDT, up one time just in two years, as shown in Figure 1.



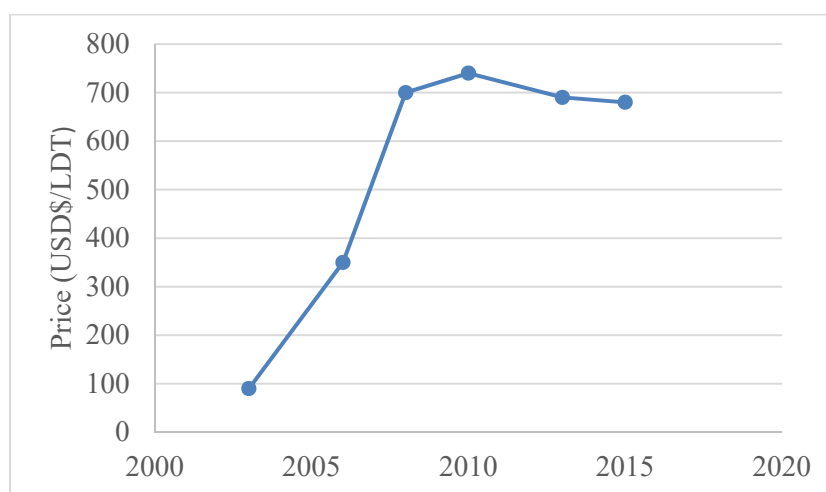


Figure 1. International price of obsolete vessels 2003 ~ 2015

It may be observed from the above-mentioned figure that in recent years the price of obsolete vessels has been rising and resultantly the shipbreaking cost has been soaring accordingly. Meanwhile, some other Asian countries, e.g. India and Bangladesh, have strived to develop the shipbreaking sector, and in consequence of some factors such as their cheap labour and low shipbreaking techniques, shipbreaking has begun booming in these countries, resulting in China's shipbreaking sector being in recession. According to statistics, China's shipbreaking enterprises purchased various obsolete vessels 1,630,000 LDTs (about 6,840,000 DWTs) at home and abroad, down 28.7 % for the number of obsolete vessels and 16 % for the LDTs, year on year. Of these, 910,000 LDTs obsolete vessels were purchased at home, down 28.1 % for the number of obsolete vessels and 17 % for LDTs, year on year; and 720,000 LDTs obsolete vessels were imported, down 29.4 % for the number and 15 % for LDTs, year on year.

In addition, with adoption of the "green shipbreaking" concept in the shipbreaking sector in China, shipbreaking enterprises need to continually improve their management, learn new shipbreaking techniques, and introduce the green-shipbreaking pattern that combines the wharf and the dock. The shipbreaking site will be rebuilt into the hardened oil-proof terrace, catch drains and collecting tanks will be constructed surrounding the site to prevent wastewater from ingress into earth, and all wastewater shall be pretreated before it is sent to the wastewater treatment plant for treatment. These measures have not only resulted in excessively high investment of China's shipbreaking enterprises to environmental protections but also been one of causes for the recession of the shipbreaking sector in China.

2. Problems in the Shipbreaking Sector

2.1. Poor quality of personnel

Neither do technicians have better knowledge about vessels, production, safety and environmental protections, some even beginning their work without training, nor do they understand harms of various pollutants and protective measures. These not only endangers their own health to some degree but also trigger possibly some accidents that should not have happened.

2.2. Confusing management of shipbreaking plants on waters outside ports

Environmental protection authorities cannot monitor shipbreaking plants on waters outside ports at all times, thus resulting in hard regulation. During the shipbreaking process, there are some procedures critical to pollution prevention, e.g. wash holds, remove oily residues, degas, break down hull bottom etc., and in addition to supervision of environmental protection authorities, these operations will be better done by shipbreaking workers if they are well conscientious of these. Some enterprises' environmental-protection-related affairs are under regulation of local environmental protection authorities and cannot be under supervision of maritime authorities, for example, Zhongxin

Shipbreaking & Steel Complex and Yinhe Shipbreaking Plant in Xinhui, are such enterprises mentioned above, which do not maintain well-improved rules and regulations, have no measures in emergent response to pollutions, have non-standard shipbreaking procedures, do not perform operations to wash holds, degas, measure explosive limits, and do hot works not in accordance with rules before shipbreaking, manage the site in a confusing way and have visible oil dirt everywhere etc. For instance, at an obsolete vessel breaking plant, Pinghu, Jiaying, Zhejiang, a grave accident happened that a dismantler died of being heavily pressed accidentally when he was cutting steel plates, fundamentally because the equipment used was simple and crude in addition to poor safety awareness and non-standard operation.

2.3. Cut-throat competition, absence of environmental protection concept, and inadequate regulation

After a vessel is obsoleted, the vessel owner, instead of removing dangerous wastes onboard, sells them with the obsolete vessel, leading to onboard wastes migrating and crossing borders. Border-crossing migration of wastes not only worsens the environment of developing countries but also harms the health of their people. Also, transporting these wastes with vessels aggravates the spillage risk, thus threatening the marine ecologic environment.

According to investigations, it is found that, even some environment-friendly shipbreaking enterprises bury some non-degradable pollutants such as asbestos deeply underground, polluting heavily the region where vessels are dismantled. In addition, there are always some illegal shipbreaking sites in the shipbreaking market which damages the normal order of the market due to their advantage in prices. Illegal shipbreaking harms the environment gravely because most are temporary with simple techniques, no measure to treat hazardous wastes is taken and wastewater and waste oil are discharged at will. Serious potential safety hazard exists since no one there assures production safety and human health and the regulation authorities neglect their administration. Illegal shipbreaking plants have existed long because of low unlawful cost and no deterrence formed due to insufficient punishment imposed by competent authorities on them.

3. Study on Strategies

With the new international shipbreaking code International Convention for Safe and Environmentally-protective Shipbreaking put in effect on May 27 2009, the policy “whoever build vessels shall be responsible for breaking it down” will be implemented. At present, key shipbreaking enterprises will have to be provided with encouraging incentives in China in order to further improve techniques applied in the shipbreaking sector and urge them to cut down pollution. The following recommendations are mainly described as below:

3.1. Enhance the management of shipbreaking enterprises and establish and maintain the “green shipbreaking” concept.

In accordance with the new standard for the shipbreaking management system ISO 30000, China’s shipbreaking enterprises shall develop a complete set of processes for green-shipbreaking management meeting the quality requirements, keep increasing their production efficiency by implementing lean management and environment-friendly shipbreaking techniques, and study in depth the production procedures consistent with the green-shipbreaking concept. In addition, they shall strengthen management and give more training to shipbreaking workers, make sure workers are protected for their health during shipbreaking, lead workers to setting up and sticking to the environment-friendly concept, make workers be skilled in shipbreaking operation and reduce pollution from manual procedures. Whenever appropriate, they shall make more efforts to employ skilled workers with new techniques so as to enhance vitality of shipbreaking enterprises.

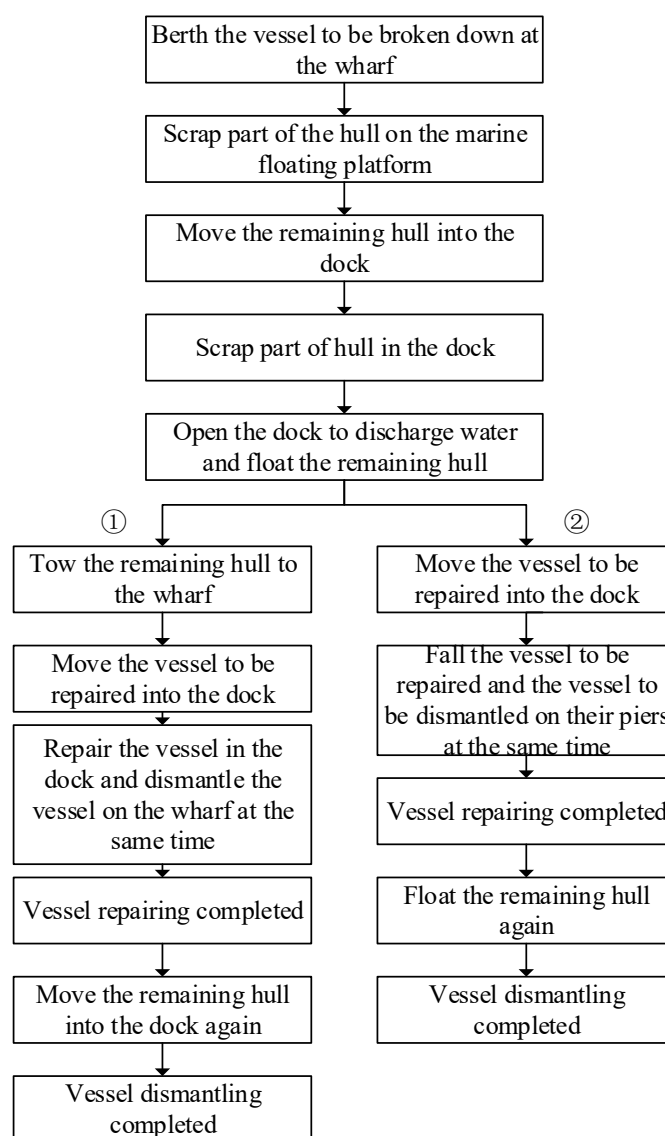


Figure 2 Basic process for the green-shipbreaking technique

3.2. By applying the new pollution-prevention shipbreaking techniques, proper efficient measures shall be taken against different pollutions.

For example, in order to optimally treat and comprehensively exploit solid wastes, the volume of discarded steel slags to be melted down and recycled will be increased; the discarded steel slags may be used in cement production, and to develop production of steel slag powder to use the steel slags in the materials for roads and buildings. The oily sludge can be treated with the supercritical water oxygenation. Using this method, the treatment is efficient and organics in the wastes can be completely oxidized and decomposed into harmless molecular compounds such as water and CO₂. Another example is emulsified oil spill at sea which can be treated by biodegradation. In the sea there are microorganisms decomposing hydrocarbons here and there, and because their metabolism causes petroleum to be decomposed as the source of carbon and energy, residues do not massively accumulate in the marine environment. In addition to being related to constituents of petroleum and its dispersion, the biodegradation rate is related to types and numbers of microorganisms which then are associated with environmental conditions, such as, temperature, salinity, pH and nutrients etc.

3.3. Requirements on shipbreaking techniques and facilities

Any new shipbreaking plants to be built shall be sited at places where water is wide and deep enough, flows slow and is sheltered from storm wind, and there is any onshore tidal flat and convenient for transportation. The shipbreaking site shall be more than 20,000 m², the storage yard for oily components shall be provided with concrete pavement and the wastewater drain ditch shall be provided with cofferdams to avoid oily wastewater from polluting soil and groundwater. The shipbreaking plants shall also be equipped with facilities appropriated for the production capacity, for instance, mooring equipment, lifting and transportation equipment, firefighting facilities, devices and materials necessary for gas defense, lifesaving and medical aid. Additionally, any shipbreaking plant shall not be less than 50,000 LDTs for the annual shipbreaking capacity, RMB ¥ 6,000,000 for the total assets and RMB ¥ 3,000,000 for the net assets.

3.4. Requirements in terms of laws

Requirements on shipbreaking pollution control specified in the Ship-recycling Convention Draft mainly include those on shipbreaking facilities, on vessels to be dismantled, on shipbreaking preparations and on shipbreaking reporting. Article IV of Ship-recycling Convention Draft provides that various hazardous materials shall not be permitted to be installed and used onboard, and effective measures shall be taken to ensure any vessel comply with these requirements. Various hazardous materials mainly refer to asbestos, substances consuming ozone, PCB and organic tin compounds. Ship-recycling Convention Draft provides that vessels to be dismantled shall: (1) be dismantled at the shipbreaking facilities approved by the Convention; (2) minimize residues of cargos, fuel oil and wastewater before the vessel moves to the shipbreaking facilities; (3) supply all available information about the vessel to the shipbreaking facility which then can prepare the shipbreaking plan; (4) complete the list of hazardous materials; (5) be issued the certificate stating the vessel is fit for dismantling by its competent authority or a body approved by the competent authority before shipbreaking starts. Furthermore, Ship-recycling Convention Draft stipulates that the vessel owner shall submit, in time, its pre-shipbreaking report before his (her) vessel is dismantled and the shipbreaking completion report to the associated authorities after his (her) vessel is dismantled.

3.5. Problems concerning responsibilities of associated administration and environmental-protection supervision authorities

Since current laws of China have stipulations to prevent repetitive configuration of authorities for shipbreaking pollution and environmental administration, cross and overlapped power and functions, and the same functions existent between different authorities, it is recommended to define legislatively powers and authority of different departments subject to different regulatory targets. Specifically, inspection and certificate issuance regarding commercial and fishing vessels shall be the responsibilities of the marine authority and fishing administration & regulation authority respectively, while approval and supervision of shipbreaking plants will be responsibility of the environmental protection authority. Thus, it is changed that defines responsibilities of shipbreaking regulatory authorities currently based on different regions and territories, thus avoiding the problem that there are a number of competent authorities but their responsibilities are not definite sufficiently.

4. Conclusion

Known as “Ship Recycling Sector”, all the more, the shipbreaking sector is a green sector, and an important part of the resource-recycling economy. Though there are some potential pollutions from dismantling of obsolete vessels, we are certainly able to prevent pollution from shipbreaking and make the shipbreaking sector a real green resources sector as long as shipbreaking is properly applied.

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