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Study on the positive measures to eliminate substandard ships in China

Jianling Ma

WORLD MARITIME UNIVERSITY

Dalian, China

STUDY ON THE POSITIVE MEASURES TO ELIMINATE SUBSTANDARD SHIPS IN CHINA

By

MA JIANLING

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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 to me.

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

(Signature): Ma Jianling

(Date): July 19th ,2013

Supervised by:

Fan Zhongzhou

Professor

Dalian Maritime University

Assessor:

Con-assessor:

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ABSTRACT

Title of Research Paper: **Study on the Positive Measures to Eliminate Substandard Ships in China**

Degree: Msc

The research thesis is a study on the positive economic measures to eliminate substandard ships in China. Today's shipping industry is still filled with substandard ships, whose physical conditions, such as hull, machinery, equipment, fail to meet the basic standards required by the relevant conventions, and also their crew's operation or activities. The substandard ships usually are not seaworthy, and which pose a great danger to the lives at sea and /or the environment. In the past decades, the maritime administrative officers tried their best to eliminate this kind of ships. Unfortunately, only Maritime Administrate Department's effort is not enough. The effort should collect from different relevant parties: Port State, Flag State, Classification Society, Industry Groups, Ship-owners, etc.

In order to come up with the possibility methods to eliminate the substandard ships, the writer has investigated five shipping companies in Ningbo region. For Maritime Administrations, the main and direct measures to supervise substandard ships are the ship inspection and shipping company audit. By analyzing the existing reasons of substandard ships, the writer arrived at a simple conclusion: the shipping is the business, the purpose of shipping companies or ship-owners is pursuing benefit maximization and cost minimization.

Therefore, after introducing the main responsibilities and present commonly used measures of Maritime Administrations to control the substandard ships, the paper

analyzes the theoretical ship's operating costs, and the cost advantages of substandard ships. Finally, the thesis proposes some positive economic countermeasures to assist the authorities to eliminate the substandard ships in China.

Keywords: Substandard Ships, MSA, Inspection, Eliminate, Economic, Market

TABLE OF CONTENT

LIST OF TABLE

LIST OF ABBREVIATION

IMO	International Maritime Organization
China MSA	Maritime Safety Administration of the People's of China
SSI	Ship Safety Inspection
FSC	Flag State Control
PSC	Port State Control
TOKYO MOU	the Memorandum of Understanding on Port State Control in the Asia-Pacific Region
PARIS MOU	Paris Memorandum of Understanding on Port State Control
ABUJA MOU	Memorandum of Understanding on Port State Control for West & Central African Region
RIYADH MOU	Riyadh Memorandum of Understanding on Port State Control
BLACK SEA MOU	Black Sea Memorandum of Understanding on Port State Control
CARIBBEAN MOU	Caribbean Memorandum of Understanding on Port State Control
INDIAN OCEAN MOU	Indian Ocean Memorandum of Understanding on Port State Control
MEDITERRANEAN MOU	Mediterranean Memorandum of Understanding on Port State Control
Viña DEL MAR AGREEMENT	Latin American Agreement on Port State Control of Vessels
NIR	New Inspection Regime
FSA	Comprehensive Safety Assessment
HRS	High Risk Ship

LRS	Low Risk Ship
SRS	Standard Risk Ship
APCIS	Asia-Pacific Computerized Information System
DMU	Dalian Maritime University
RO	Recognized Organization
RMB	Renminbi
DWT	Dead Weight Tonnage
ICBC	Industrial and Commercial Bank of China Limited
BOC	Bank of China
OEM	Original Equipment Manufacture
ISM	International Safety Management
ISMA	International Ship Managers Association
BIMCO	Baltic and International Maritime Council
ICS	International Chamber of Shipping
BE	Baltic Exchange
BFI	Baltic Freight Index
BDI	Baltic Dry Index

Chapter I: Introduction

1.1 Background of this study

With the rapid development and economic relationship of the world economy, the modern international economy and trade are going on towards the new development trend of the economic globalization, regional integration and trade liberalization. Shipping, as the important bond and bridge for international trade, is the foundation for achieving some new development such as Global economic integration, Regional economic groupings, Trade liberalization. World shipping economy, for all countries and regions during the process of international trade and international division of labor, is regarded as a manifestation of achieving the international economic links. According to International Maritime Organization (IMO) statistical data, shipping trade accounts for 85% of international trade volume. Therefore, marine trade means international trade to some degree Wang, L.J & Wen, S.Y, 2010, p.55-57).

However, while the shipping economy is booming, some ineligible or mercenary companies, as well as substandard ships and crews, are flowing into the maritime industry, which has brought in a lot of hidden troubles and caused many marine accidents. A “substandard ship” is regarded as a vessel that, through its physical condition, its operation or the activities of its crew, fails to meet basic standard of seaworthiness and thereby poses a threat of life and /or the environment (IMO, 2002). On April 16th, 2014, the passenger ship “SEWOL” carrying 470 people sank because of inundating in southwest waters of Korea, which has caused 284 deaths in this special accident. According to local media analysis, some possible causes such as design flaws, random reconstruction of ship, mis-operation of crew and emergency

plan failure(especially crew's unauthorized escape), accounted for this marine accident. This accident has also led to the dissolution of the Korea coast guard department. Therefore, substandard ships pose as a great threat to the lives of crew and passengers. As the "maritime security defense" of government, the Maritime Safety Administration of the People's of China (China MSA) will take unshakable responsibility and obligation.

According to the national laws and regulations, China MSA is responsible for the authority of marine safety supervision, pollution prevention, marine and offshore facility inspection, maritime security management and administrative law enforcement, and performance of the department of transportation production safety management functions, etc(http://www.msa.gov.cn/). The major work for China MSA is Ship Safety Inspection (SSI), which is carried out by the authority department for implementation domestic laws, regulations, technical specifications and relevant international conventions. According to the prescribed procedures，the officers carry out SSI for the arrived ships, estimate and determine whether the ships (and seafarers) holding with appropriate and effective certificates, the technical condition of ships conforming to the requirements of the relevant provisions. After the SSI, the officers would propose how to handle requirements and correct the defection. SSI is one of the most direct and effective means of law enforcement for China MSA to exercise its duty, and play an important role in the safety and security of shipping and the prevention of marine pollution by ships, especially in supervision of foreign ships. The SSI generally is known as "the bottom line for marine safety".

1.2 Objective of this study

The main function of ship safety inspection is to force ships to correct defects and conform to specifications for a long time through irregular random check, which is supplement to “source” management of the maritime administration, not just a simple auxiliary function. Taking ship hardware for an example, it is necessary to take further steps to explore the deeper meaning of ship safety inspection. The source management of marine hardware is vessel inspection (CCS, DNV). There is no defect in the ship hardware in theoretically after obtaining the navigation certification through inspection. But it is not the truth. Ships as a dynamic system will have “new” defects if not properly maintained in the operating process. “Remaining” defects refer to what is not discovered or corrected during the ship inspection. The main function of ship safety inspection is to discover the “new” defects or “remaining” defects through ship inspection and to force ships to take some corrective measures, thus ensuring ships in a seaworthy condition for a long time. This is a complement to “source” management of vessel inspection. Secondly, “remaining” defects discovered during ship safety inspection are valuable message. Ship inspection administrative department can study and analyze these feedbacks to discover something which should be adjusted and improved, thus taking some measures accordingly to promote the “source” management of vessel inspection.

As to crew management and audit work of shipping company and ship safety management system, SSI is also a complement to forging a virtuous closed loop control mechanism within maritime administration. So, SSI is a positive complement to main “source” management responsibility of maritime administration. Maritime management system can form into a self-adjusting and dynamic operating

mechanism through feedback of SSI and collaboration within maritime administration.

Therefore, SSI is management function of maritime administration to take initiative to take dynamic control of safe vessel assembly operations. As a positive complement to “source” maritime administrative functions, such as ship inspection, crew management, auditing of safety management system etc, SSI can urge ships to discover and correct the existing defects, eliminate the hidden dangers and ensure the marine safety.

However, SSI cannot control and/or eliminate the substandard ships on the root cause. There are many substandard ships building on the beach or tidal flats, sailing on the water. The ship-owners of substandard ships are earning money by using their ships. SSI can only constraint on limited aspects, but that’s not enough. As a member of China MSA, we should not mind-set on administrative way, but change our ideas to the economic aspect. Using the regulation of market mechanism may be the better way to control or/and eliminate the substandard ships.

1.3 The purpose and contents of this Study

The inspection of substandard ships is based on relevant domestic laws, regulations, rules and international convention. Many port states have established united and integrated supervision mechanism, so is China. According to national conditions, China has also set up important management rules for tracking ships, and restrict the substandard ships’ operating, so as to safeguard life and property on the sea, and protect the marine environment. Though there are lots of prohibitions, substandard

ships are still blooming and causing lots of maritime accidents, which have led to great loss of lives and property.

This thesis, based on wide and deep study of the current situation and open questions in Flag State Control (FSC) and Prot State Control (PSC) inspection, combined with writer's eight years' work experience, aimed at the situation of resurgence of substandard ships, is putting forward a discussion whether effective maritime supervision can affect the economic benefits of substandard ships, in terms of targeted maritime administration for ships' actual operating. At the same time, considering the situation that maritime industry and shipbuilding industry, as our country's pillar industry, have suffering depression for a long time since the international financial crisis in 2008, it is necessary to combine promoting the healthy development of maritime industry with effectively restricting the substandard ships. Finally, this thesis would propose some countermeasures to control or/and eliminate the substandard ships, which as the operators participating in the market competition.

This thesis concludes these sections as below:

(1) Summary, Background of studying substandard ships, and the purpose and contents of the study.

(2)Introduction about the SSI in China, and the Main Regional Maritime Organizations.

(3) Analyze the Existence Causes of Substandard Ships.

(4) Theoretical Analysis of Substandard Ships Operating Expense.

(5) Analysis of the Reason Why Ship-owners Choose Substandard Ships.

(6) The Current Constrained Measures to Substandard Ships from MSA and Some Proposals.

(7) Conclusion.

Chapter II Introduction the SSI in China and the Main Regional Maritime Organizations

2.1 The meaning of SSI and its short slab

Ship Safety Inspection generally can be divided into FSC and PSC. The flag states carry out FSC to the ships flying national flag by using national laws and regulations, while the port states carry out PSC to the foreign ships arriving at national ports by using national laws, regulations and relevant international conventions.

FSC and PSC is a pair of concepts of mutually corresponding. The most difference of the two are the distinct adopted legislative gist and target ships flying different national flags, especially in China. Moreover, according to different navigation zones and technical standards, SSI can also be divided into international sailing ship's safety inspection, domestic coastal sailing ship's safety inspection and inland ship's safety inspection (Maritime Safety Administration of the People's of China, 2011, p. 232). Meanwhile, compared with FSC representing the maritime management responsibility, PSC is more focused on the sovereignty of port state, which is one of the measures adopted by maritime administration of port states to rule the ships flying foreign flag, and to control the substandard ships. It is very important to understanding the relationship between FSC and PSC, which involves five questions as below (Zhao, S. X, 2007):

(1)Who will take the main responsibility of the ship safety management? Is Port States or Flag States?

(2)In the ideal state, is there a necessity that PSC must exist?

(3)If flag states can't perform their duties effectively, is PSC a useful tool to promote the ship safety?

(4)Does PSC play an effective role in reducing the number of substandard ships?

(5)Can PSC replace FSC?

The answers to the five questions above are certain. We can all see clearly the relationship between the PSC and FSC: flag states are the main departments to implement the safety administration and bear the responsibility of ship safety management. As to port states, PSC is more of playing a role of ensuring safety of internal navigation. In the ideal state, if flag states can perform their duties effectively, it is not necessary for PSC to exist. If not, as the history of PSC development has showed, PSC can play a positive and important role of promoting the ship safety, and reduce the numbers of substandard ships, which have already achieved good results. But in fact the flag states bear the main responsibility of ship's safety management; PSC is an active auxiliary to FSC and cannot replace the supervision of flag states as well as FSC.

Although SSI have strengthened the protection of marine environment and ships' safety, it is assuring that without regional cooperation, substandard ships and corporations cannot be eliminated and the ship-owners and corporations will transfer their ships to somewhere without PSC or run administrative management loosely, which will bring unfair competition to the standard ships. Many regions have or are joining the regional port states memorandum organization.

2.2 China MSA

China has implemented the supervision of port states since 1986 and is one of the official member states of TOKYO MOU since 1994. As an important defense line of maritime safety, port states supervision has played a tremendous role in eliminating substandard ships, improving the ships safety performance, ensuring aquatic traffic safety, preventing ships from polluting the marine environment. Forty-eight ports in China had implemented PSC inspection work until 2008(Wang, H. C, & Ning, B, 2009, p.20-22). In 2013, 15014 individual ships had visited China ports, and 6231 individual ships had been inspected by the China PSCO. The inspection rate was 41.5%. In these ships, China MSA has carried out 9561 initial and follow-up inspections, 8078 initial inspections, and 1483 follow-up inspections. In the PSC working, there were 6780 inspections with deficiencies, which the total number is 43762. In the inspected ships, 659 substandard ships were detent, and the detention rate was 8.16% (Annual Report on Port State Control in the Asia-Pacific Region. 2014).

Besides, the China MSA has taken many measures to solve the problem of internal substandard ships, such as setting up the “black list” system (as named “key tracked ships”) and “double white list” system (ships and captains with safety and competency), listing the ships with low-tech and messy management as “key tracked ships” to monitor and inspect in every port, giving preferential treatment to ships and captains with safety and competency, encouraging the shipping company and crews to achieve safety management work of ships consciously. According the Ningbo MSA’s report, there were 39 companies listed in the white list in Ningbo Region, while 31 companies in the black list, and 80 companied in the common list. Corresponding to the ship, there were 94 individual ships in the white list, 410

individual ships in the common list, and 220 individual ships in the black list (Ningbo, 2014). Meanwhile, on September 1, 2013, China MSA issued and implemented regulations of "supervision and administration of key tracing ships", monitoring especially the following kinds of ships (http://www.cz-msa.gov.cn/art/2013/6/6/art_4205_427672.html):

(1)Chinese sea vessels and river vessels have been detained for 2 times in ships safety inspection (including supervision and inspection of overseas port states); foreign ships have been detained for 2 times by China MSA in supervision and inspection of port states in the past 12 months.

(2)Refusal to accept or avoid punishment after violation of laws and regulations

(3)Holding fake, altered, transferred, traded, rental ship's certificates or reorganizing and rebuilding the ship's construction and equipment without approval of responsible authority leading to grave fault between actual state and condition on ship's certificate.

(4)All ships that have a marine traffic accident leading to 5 or more people dead (missing) and belong to shipping company with serious defects in safety management after investigation.

(5)All ships that belong to shipping company, more than one third of whose Chinese ships are listed as key tracing ones.

(6)The China MSA appointed key tracing ships

2.3 The main regional maritime organizations

Since the implementation of Paris Memorandum of Understanding on Port State Control (PARIS MOU), as the last line of defense to protect maritime security and fight pollution, PSC is playing a more active role in "ensuring the safety of life and

property at sea, protecting the marine environment, blowing the substandard ships and maintaining the fair competition in international maritime industry, which has been the focus of attention and admired throughout the world. Establishment and effective operation of regional co-operation regimes on port State control has formed a worldwide network for elimination of substandard shipping. Currently, there are a total of nine regional port State control agreements (or MOUs) covering the major part of the world, namely: ABUJA MOU, BLACK SEA MOU, CARIBBEAN MOU, INDIAN OCEAN MOU, MEDITERRANEAN MOU, PARIS MOU, TOKYO MOU, RIYADH MOU, and VINA DEL MAR AGREEMENT. In this thesis, we would discuss the main regional maritime organizations: TOKYO MOU and ARIS MOU.

2.3.1 TOKYO MOU

The TOKYO MOU is an inter-governmental co-operative organization on port State control (PSC) in the Asia-Pacific region. The vision of TOKYO MOU is to eliminate substandard shipping in the Asia-Pacific region, while the mission of it is to promote the effective implementation, and the universal and uniform application, of relevant IMO/ILO instruments on ships operating in the region (http://www.tokyo-mou.org/). Year 2013 the Tokyo MOU celebrated its 20th anniversary.

The TOKYO MOU has taken many measures to control and eliminate the substandard ships, and one of countermeasures is publishing a list of under-performing ships. The Port State Control Committee of TOKYO MOU has the responsibility to publish the list, which is the purpose to increase pressures on the substandard ships. The ship, detained for three or more time during the past 12 months, would push into the list. Once the ship listed in the list, it is subjected to more inspections at each port of call within the TOKYO MOU region. For example,

the ship listed in the list arrives Ningbo port, it would be took more inspection than the ship not in the list.

Another countermeasure to combat substandard ship, TOKYO MOU takes over the White, Grey, and Black lists and detention lists available on the Internet. The Black, Grey and White list for flag State performance is established annually taking account of the inspection and detention history over the preceding three calendar years and is adopted by the Tokyo MOU Committee to publish in the Annual Report. All ships in the Asia-Pacific Computerized Information System (APCIS) will be assigned either as high, standard or low risk based on generic and historic parameters：High Risk Ships (HRS) are ships which meet criteria to a total value of 4 or more weighting points；Low Risk Ships (LRS) are ships which meet all the criteria of the LRS parameters and have had at least one inspection in the previous 36 months，and Standard Risk Ships (SRS) are ships which are neither LRS nor HRS (TOKYO MOU,2013). We can clearly see from the below table 1.

Table 1 – Ship Risk benefit

<table>
<tr><td colspan="2" rowspan="3">Parameters</td><td colspan="4">benefit</td></tr>
<tr><td colspan="2">High Risk Ship (HRS)(When sum of weighting points >=4)</td><td>Standard Risk Ship (SRS)</td><td>Low Risk Ship (LRS)</td></tr>
<tr><td>Criteria</td><td>Weighting points</td><td>Criteria</td><td>Criteria</td></tr>
<tr><td colspan="2">Type of Ship</td><td>Chemical tanker, Gas Carrier, Oil tanker, Bulk carrier, Passenger ship</td><td>2</td><td rowspan="9">Neither LRS nor HRS</td><td>-</td></tr>
<tr><td colspan="2">Age of Ship</td><td>All types > 12y</td><td>1</td><td>-</td></tr>
<tr><td rowspan="2">Flag</td><td>BGW-list</td><td>Black</td><td>1</td><td>White</td></tr>
<tr><td>VIMSAS</td><td>-</td><td>-</td><td>Yes</td></tr>
<tr><td rowspan="2">Recognized Organization</td><td>RO of TokyoMOU</td><td>-</td><td>-</td><td>Yes</td></tr>
<tr><td>Performance</td><td>Low/Very Low</td><td>1</td><td>High</td></tr>
<tr><td colspan="2">Company performance</td><td>Low/Very Low</td><td>2</td><td>High</td></tr>
<tr><td>Deficiencies</td><td>Number of deficiencies recorded in each inspection within previous 36 months</td><td>How many inspections were there which recorded over 5 deficiencies?</td><td>No. of inspections which recorded over 5 deficiencies</td><td>All inspections have 5 or less deficiencies (at least one inspection within previous 36 months)</td></tr>
<tr><td>Detentions</td><td>Detentions</td><td>3 or more detentions</td><td>1</td><td>No detention</td></tr>
</table>

Resource: https://www.parismou.org/

2.3.2 PAIIS MOU

The PARIS MOU is an inter-governmental co-operative organization on port State control (PSC) in the European region, which consists of twenty-seven maritime Administrations and the cover the waters from Europe to North America. The basic principle of PARIS MOU is that the prime responsibility for compliance with the requirements laid down in the international maritime conventions, which lies with the ship-owner/operator. Responsibility for ensuring such compliance remains with the flag State (https://www.parismou.org/).

After the “Prestige” sunken wreck and leakage accident, EU has realized that the original port states supervision and inspection mechanism cannot stop substandard ships from entering into the maritime industry. To avoid and reduce the substandard ships entering into its waters, since March 11, 2009, EU has passed a package of the third set maritime safety laws, namely 2009/16/EC. PARIS MOU New Inspection Regime (NIR) was put into effect since January 1, 2011, which has brought in company performance appraisal and concept of different inspection frequency for corresponding ships with different risks. PARIS MOU NIR has fully made use of the research findings achieved by IMO Comprehensive Safety Assessment (FSA) to cut down inspection obligation for high-quality and low-risk ships. PARIS MOU NIR has brought FSA theory, which center on risk analysis, into shipping safety management, by adopting flexible and lasting regulations to distinguish and evaluate the risk of ships according to performance of flag states, inspection agency and ships corporations. Ships have to hang the flags of flag states in the white list of PARIS MOU and finish completely the inspection scheme of IMO member states. Besides, the ship must be operated by PARIS MOU and high quality company recognized by at least one of the member states, and has never been detained or missed more than 5 registration items in every inspection during the past 36 months.

There are many changes in the new inspection system, such as setting up new evaluation model of ships risk, bringing ships management companies' performance into ships risk evaluation system for the first time, adding new prohibition for ships to enter and so on. Instead of following "Target Factor" of ships, the new evaluation will divide the factor affecting ships safety and anti-pollution into two kinds, namely Generic Factors and Historical Factors. Then comprehensive evaluation of the two factors will get the risk value of a ship. Special attention that should be paid is that the new system has list the ships management companies' performance as a generic factor for the first time. Ships can be divided into three risk grades according to risk value: Low Risk Ship (LRS), Standard Risk Ship (SRS) and High Risk Ship (HRS)

Table 2: Ship Risk Benefit (PARIS MOU)

<table>
<tr><th colspan="3">Assessment Factors</th><th>HRS</th><th>LRS</th></tr>
<tr><td rowspan="8">General Factors</td><td colspan="2">TYPE</td><td>Tanker, bulk carrier, chemical ship, LNG, Passenger Ship (Weight Point 2)</td><td>Any</td></tr>
<tr><td colspan="2">AGE</td><td>Over 12 years (Weight Point)</td><td>Any</td></tr>
<tr><td rowspan="2">Flag State Performance</td><td>White, Grey, Black List</td><td>Black List – VHR, HR, Between M and HR (Weight Point 2)
Black List – MR
(Weight Point 1)</td><td>White List</td></tr>
<tr><td>IMO Voluntary Audits</td><td>/</td><td>Yes</td></tr>
<tr><td colspan="2" rowspan="2">RO Performance</td><td>Low (Weight Point 1)</td><td>High</td></tr>
<tr><td>Very Low (Weight Point 1)</td><td>High</td></tr>
<tr><td colspan="2" rowspan="2">ISM Company Performance</td><td>Low (Weight Point 2)</td><td rowspan="2">High</td></tr>
<tr><td>Very Low (Weight Point 2)</td></tr>
</table>

Historical Factors	Number of Deficiencies Recorded in Each Inspection	/	No. of Inspection which recorded less 5 deficiencies
	Number of Detentions	2 or more detentions (Weight Point 1)	No Detentions
Remark: In the Flag State volume, the assessment is for the performance of Flag State in the White, Grey, and Black Lists. VHF is standard for Very High Risk, HR is High Risk, and M is Medium Risk.			

Resource: https://www.parismou.org/

Chapter III Analysis of the Existence Causes of Substandard Ships

3.1 Definition of substandard ship

In order to finding the countermeasures to control or eliminate substandard ships, the experts, in the maritime field, have used concise language to highlight the main contents or problems of these trouble-make ships. Different people have different understanding. The expert Liu Jingyi from Qin Huangdao MAS had referenced the definition of substandard ship as following: a “substandard ship” is regarded as a vessel that, through its physical condition, its operation or the activities of its crew, fails to meet basic standard of seaworthiness and thereby poses a threat to life and /or the environment (Liu, J.Y & Chen, X, 2009, p.146-148). Therefore, the expert Gao Deyi from Dalian Maritime University (DMU) said in his monograph: the substandard ship is the ship whose hull, machinery, equipment, or operational safety is substantially below the standards required by the relevant convention or whose crew is not in conformance with the safe manning documents (Gao, D. Y, 2002, P.3).

As we can see from the above mentioned definition, the substandard ship is not only caused by physical reasons, but also is manned by the incapable crews. Once the substandard ship sailing on the sea, it causes a higher impossibility of marine accidents or expands the accident’s losses, when its birth defects encountered with some accidental causes. The main losses include but not limit to loss of lives, loss of property, expense of rescue or search, environmental damage.

3.2 The typical manifestations of substandard ship

According to the definition of substandard ship as 3.1 listed below, the substandard ship can be classified into two kinds: bad physical condition of ship and ineligibility crews.

The bad physical condition of substandard ship also can be divided into two possibilities. The first possibility is that the ship is launched with good state. There were no innate deficiencies as that the ship was complying with the requirements of domestic laws, regulations, technical specifications and relevant international conventions. So, the ships hold the qualified certificates issued from the Flag State government. As time goes on, the age of ship was increasing. Once, the PSCO or FSCO inspected the ship and found the bad conditions of hull, machinery, equipment of the ship. The ship was considered as a substandard ship and was detained.

The other possibility is the congenital deficiencies of the substandard ship. There is no drawing or drawing without reviewed, ship's building material does not achieved the Recognized Organization's(RO) requirements, the process of whole building without effective administration, the ship yard does not holding ship's construction qualification and other non-conformance terms. Therefore, the ship's quality is far from the requirements of domestic laws, regulations, technical specifications and relevant international conventions. For example, the beach-built ships are the typical substandard ship. Taizhou is the region that had the long history of ship built on the beach. It is very unfortunate that this traditional remain to the present. According to the Taizhou local press, there are eighty-three shipyards in the region, and more than 250 ships launched in the first half of the year 2008(http://www.taizhou.com.cn/a/20080724/content_73059.html). The news does

not state how many ships were built on the beach. But base on the writer's estimating, the number of beach-built ships maybe account for half of the quantity.

Ineligibility crews working on board are the time bomb. According to the IMO's statistics, the human factors on the marine accidents account for 80% (Yang, Y. N, 2012). Crews may not be well trained, may not master the obligatory seamanship, and may not have the strong sense of responsibility, etc. During the daily operation, the ship cannot obtain necessary technical support, effective management and regular check service from the crews. Therefore, the substandard ship has the high risk to be detained in the PSC or FSC inspection. Crews also would fear to accept inspection. These vessels have very high risk to be punished in the inspection.

3.3 Reasons for the long-time existence for substandard ship

3.3.1 The failure of classification societies to enforce regulations

The classification societies have always been seen as the first defense line to ensure the ship's safety. However, the unreasonable personnel structure, remote inspection and certificate from remote classification societies lead to the vessel inspection evolved into the formalism. The substandard ships, failure to meet the relevant regulations, can get the certification from the failure societies easily.

The European Commission DGVII.s Director of Maritime Transport noted/In shipping, almost all safety regulation is centered on Flag States, ship-owners and, to a lesser degree, on classification societies. That leaves very important areas of the responsibility chain completely out of the regulatory picture (SSY Consultancy & Research Ltd., 2001). So, the classification societies not only should implement the regulations, but also the relating instruments to regulations should be available.

Unfortunately, there are still existing vacuum regulations for classification societies' implementation in China.

3.3.2 Absent administrative for some Flag States

Mr. O. Neil, the former IMO secretary, stated that if their administration is lax, then implementation of international standard will suffer and in the end accidents will start to mount up (W. A. O'Neil, 2000). The absent administration of Flag States in implementing maritime safety regulations leads to some ship-owner operating substandard ships. Or, some Flag States implement the safety regulations lacking of unified standards or understanding. Take some convenient flag states for example, these Flag States seldom supervise the ship's operating, and the ship's physical condition and its crews, while encourage the ships including substandard ships flying their flags.

3.3.3 Widespread of open registries

The formation of convenient flag ships can date back to the 16th century. After several centuries' development, it already occupies more than half of the world's fleet (Lu, Y. M, 2012, p.54-56). In order to attract more merchant fleet, many Open Register State implement relatively low safety standards, loose the registering requirements, and provide preferential policies. Meanwhile, they do not having the passion on the fight against substandard ships. This causes the nausea cycle. The more irresponsibility Open Registries widespread, the more substandard ships exist.

3.3.4 Economic advantages of substandard ships have

Operating substandard ships can help some ship-owners to pursue the cost reduction and profit growth. Some ship-owners choose substandard ships because of by-non-observation of international standards, decrease the maintenance cost, and cut the crew's cost. Meanwhile, the shippers or charters may use substandard ships, which usually have the lower cost than the standard ships. For example, According to the information gained by the chat with the ship-owners, the cargo owners pay more freight for using standard ships from Ningbo port to Wuhu port, when they want to transport the same cargo. By this mean, many shippers select the substandard ships to transport their cargo, which can cut the transport cost and increase profit.

3.3.5 Other factors

The Dutch Minister of Transport pointed out that: users of substandard ships know that when a vessel is caught by a PSC/FSC inspection, and detained for serious deficiencies, it is the owner who suffers. Others can escape without penalty (SSY Consultancy & Research Ltd., 2001). There are many parties participate in the maritime industry, but not all of them have been covered in the national legislation and international conventions, and they can escape from the penalty. For instance, once the substandard ship is detained in the FSC inspection, the influence for the shipper is limited. The shipper can change another substandard ship to carry the cargo. What is more, the shipper can get compensation from the ship-owner if they have agreement in the contract.

Chapter IV Theoretical Analysis of Substandard Ships Operating Expense

As described in Chapter 3.3.4 of this paper, substandard ships have economy advantages in market competition while corporations are chasing the maximum profit in nature. This Chapter is going to analyze the operating of substandard ships instead of the shipping companies' operation.

4.1 Summary of ships' operating expense

The monetary expression of value of necessary labor in materialized labor and living labor that enterprise cost in the process of producing commodities and offering labor service is an important part of commodity value (Tan, Y. 2005, p.11). Prime cost is a economic category of commodity economy. Ships operating expense is a sum of materialized labor and living labor spent during transporting particular commodity. In the broader sense, ships operating expense conclude indirect labor that back offices in shipping companies cost to offer service for transportation labor (Xu, Q, 2011, p.185). Shipping operating expense is an aggregative indicator reflecting the economic efficiency of ships. Every step during the transporting process will affect the operating cost. Less operating cost means that ships can achieve better economic efficiency, otherwise means limited profit space and even deficit. Therefore, operating expense is an important basic and factor of making policy in shipping companies, whether making investment decision, technical decision or management decision.

4.2 Analysis of ships general operating expense

Analysis of ships operating expense can be conducted in the following 3 aspects:

4.2.1 Ships general operating expense can be divided into constant cost and variable cost according to the relationship between cost and ships' operation.

From the traditional point of view, ships operating expense can be divided into constant cost and variable cost according to the relationship between cost and ships' operation. Of course, constant cost and variable cost are not absolute. As ships' operation have different forms, constant cost and variable cost always have different contents but still can be distinguished roughly by the following.

4.2.1.1 Constant cost

Constant cost refers to expense spent to maintain the operating condition of ships, which is free from commodities' regulation and remains constant at certain time and within transport capacity. Constant cost include crew wages, meal allowance, depreciation cost, repair cost, oil fee, insurance expense, shipping sharing expense, company's management sharing expense and other constant costs.

4.2.1.2 Variable cost

Variable cost refers to expense spent during the transporting of ships' operating. Variable cost is related with different kinds of factors, such as row space, intervals in the port, quantity of goods, fuel consumption, and proportion of shipping and berthing, and changes with different voyage condition. Variable cost includes fuel fee, port charges (handling charges of cargo work and other charges), transportation expenses, dunging charges, commission charges, accident damages and other variable expenses.

4.2.2 Ships' general operating expense can also be divided into capital cost, running cost and voyage cost.

4.2.2.1 Capital cost

Ships capital cost, namely purchasing funds, is the fundamental ships cost, which includes loan interest, expenses of taxation and depreciation cost. In the short term, ships capital cost can be regarded as constant cost and can be transferred into variable cost by renting ships.

4.2.2.2 Running cost

Operating cost refers to constant supporting cost for maintaining the seaworthiness, which includes crew wages, insurance expenses, compensation, maintenance expense, material-running cost, supplies cost, management cost and other operating costs. Voyage cost refers to expense spent on specifically transporting voyage, includes fuel fee, port and canal fee, cargo work fee, and other voyage cost.

4.2.2.3 Voyage cost

Voyage cost refers to expense spent on specifically transporting voyage, includes fuel fee, port and canal fee, cargo work fee, and other voyage cost. Ships fuel fee is the major component of ships operating costs. Fuel fee refers to a sum of fuel cost during voyage, berthing and cargo handling.

4.2.3 **Transportation cost per-unit**

Transportation cost per-unit reflects the aggregative indicator of quality of ships' work. Unit transportation cost reflects the expense spent on freight volume per-unit at a certain time.

Any changes in the ships operation will finally be revealed by the indicator through alteration of operating cost or traffic capacity. Therefore, it can reflect the quality of shipping operating organization, materials consumption and monetary expenditures, utilization level of equipment and the level of labor production rate. The calculation formula is as follows:

The three aspects mentioned above are listed from a different point of view, but the method mentioned in 4.2.2 is more applied to shipping companies for the moment and its cost accounting is conducted with capital, costing and profit analysis under different operating condition.

4.3 Theoretical analysis of controlling operating cost for ship-owners

4.3.1 Ships capital cost controlling

Ships capital cost, namely ships purchasing funds, is the fundamental cost. To increase revenue and reduce expenditure, the first step is to control the capital cost, especially the choice of ships investment pattern and depreciation cost.

Ships investment belongs to the fixed assets of shipping company and is the fundamental investment for corporation to form the capacity of production and operation. According to the influences on the production and operation, ships

investment is a strategic investment affecting overall situation, changing direction and striation. Maritime industry is a special industry, which means that ships investment has particularities, such as huge amount of investment, long payback period, diversification of investment currency, complexity of investment content and handling, high investment risk. Therefore, before making the investment decision, it is necessary to analyze and compare the alternatives and choose the optimal scheme with high profit, short payback period, good quality, low capital cost and beneficial development for company.

It is important to make use of depreciation properly to control the ships investment cost. Depreciation means that cost of ships is shared designedly in serviceable life. Shipping company or personal investing on purchasing ships should make sure that the investment funds will backflow as soon as possible, which means retrieving the currency invested into operating ships and deriving benefit in the long time, namely investment plus.

4.3.2 Ships operating cost controlling

Ships' operating cost is constant supporting expense for maintaining seaworthiness. To increase revenue and reduce expenditure, it is important to control ships operating cost, especially crew expense, materials and supplies cost and maintenance costs.

4.3.2.1 Crew cost

Crew wages occupy about 25-45% of ships operating cost (Xu, Q, 2011, p.195). In recent years, increasing shortage of national or international crew, especially senior navigation officers, has led to the increase of crew wages year after year, which has

occupied more and more proportion of shipping operating cost. For example, Zhejiang Hongcheng shipping Co,LTD, is a shipping company that operated four ships. According to the company's statistic, the crew cost is increasing in recent year. The company paid 7.76 million Renminbi (RMB) in 2009, 7.14million RMB in 2010, 9.60 million RMB in 2011, and 10.2 million RMB in 2012. We can see that the crew cost has increased 30% from 2009 to 2012.

4.3.2.2 Cost of spare parts and materials

Cost of spare parts and materials is the major component of ships operating cost, which will be diverse according to different ship condition and management. The need for spare parts and materials has two following characters: one is that some parts of equipment need constant replacement due to natural or man-made damages. The other is that some part of equipment in static and dynamic coordination, their size has exceeded the maximum requested by instructions and need replacement to ensure the safety operation of equipment. Therefore, on the basic of fulfill the fundamental seaworthiness request, the controlling measures reducing the spare parts and materials costs should strengthen management, purchasing program and inventory replenishment.

4.3.2.3 Ships maintenance cost

Ships maintenance can be divided into three categories: shop repair, voyage repair, self- repair.

Shop repair is that owners arrange ships designedly to shipyard according to ships' condition and code requirement for thorough examination, repairing and certification.

The shipyard should get the preparing work ready before repairing, report honestly and objectively the problems to the owners, normatively and systematically work out the list of repairing ships, clearly list repairing items and remark on essential equipment with a name and model number. It is important to choose a good shipyard and get a comprehensive understanding of repairing skills, technical and port condition to ensure the repairing quality and reduce the maintenance cost. Voyage repair can take advantage of interval in port to solve the problem, which will improve the operating rate and reduce the ships cost without suspending service. Generally, voyage mainly carries out urgent repair to solve the safety problem affecting shipping.

Self repair can be divided into operating period and shop repairing period. The extensive and complex compartment equipment makes it difficult to adopt self repair to handle ships structure. The range of self repair can extend from lifting out piston and maintenance of main engine and auxiliary engine in service time to routine open inspection of equipment at regular periods.

4.3.2.3 Ships voyage cost

Ships voyage is expense spent for specific voyage transportation. The key to control the voyage cost is to save the fuel expense by making use of the relationship among freight rates, oil price and navigational speed.

High energy consumption is the main reason why ships' operating cost has been stubbornly high. As fuel cost has occupied more than 40% of ships operating cost (Su, F. M & Ma, H.B, 2011, p.4), this problem is an unavoidable problem in ships operating. On the one hand, ships owners should balance oil price and oil quality.

Bad oil quality will produce abrasion of main engine sleeve and piston ring greatly, speed up the excessive wearing of oil pump plunge and head needle valve, causing problems such as main engine starting problem, insufficiency burning, declining rotation rate. Therefore, bad oil quality will reduce cost in a degree, add to maintenance and spare parts cost, quantity of crew work and bad technical condition of ships, which will in turn increase the operating cost. On the other hand, fuel consumption and navigation speed does not work in linear relation. Generally, navigation speed and fuel consumption work out in cube relation. The relationship between navigational speed and unit fuel consumption is showed as Table 4.

Table 3: The unit fuel consumption of "XX" vessel in different navigational speed

rotation rate /($r.mh^{-1}$)	81	84	87	90	92	95	98	101	104	106	109	110
navigational speed /kn	14.5	15.0	15.6	16.1	16.5	17.0	17.5	18.1	18.6	19.0	19.5	19.7
fuel consumption /($t.d^{-1}$)	25.5	28.4	31.6	35.0	32.7	36.2	39.9	43.8	54.0	57.2	62.2	63.9

Resource: Ren, Y. Q, (2011), Thinking of the problems for navigational speed and fuel consumption. *World Shipping: maritime management*, 192, 16-17.

Therefore, ships should choose the economic navigation speed and take into consideration of shipping characteristic, marine hydrology, meteorological condition, flowing condition to reduce effectively fuel cost.

Chapter V Analysis of the Reason Why Ship-owners Choose Substandard Ships

The investors are inclined to low risk and high payback. The reason why ship-owners choose low quality ships is that they seek high payback of interests. With the international depression of maritime industry, ship-owners are extending the durable years of ships, recruiting crew, installing equipment, running management system with substandard standards, especially putting old ships and beach-built ships into market. Except for getting residual value in dismantling, more old ships are still devoting to their work in the maritime industry after reselling and repairing, especially the beach-built ships and other substandard ships. This Chapter is going to analyze the probable cause of choosing substandard ships, in terms of getting more interests.

5.1 Analysis of ships capital cost

Ship is the main tool of production in maritime industry. Acquisition cost and financial model choice are the prime questions for ship-owners to consider. This Chapter is going to analyze briefly ships acquisition cost and financial model. While the way of ship's depreciation, it is considering the fact that disparate country (or region) has its tax revenue characteristic and diversity.

5.1.1 Ships acquisition cost

Ship-owners are always going to analyze and compare the feasibility plan before investing ships, especially the acquisition cost. How to spend less acquisition cost and get more service life of ships is the first question for ship-owners to be

considered. According to China's old transport ships administrative regulations, the vessels have their service life. Once the vessel's age gets the years regulated in the regulations, it should be exit the transportation market. The scrap vessel's age can be seen from Table 5.

Table 4: Standard of Vessel's Scrap Age

Parameters	Age of Ship	Special Timed Inspection Age	Scrap Age
First Class Old Ship	≦10 Years	≧18 Years	≧25 Years
Second Class Old Ship	≦10 Years	≧24 Years	≧29 Years
Third Class Old Ship	≦12 Years	≧26 Years	≧31 Years
Fourth Class Old Ship	≦18 Years	≧28 Years	≧33 Years
Fifth Class Old Ship	≦20 Years	≧29 Years	≧34 Years

Remark: old and outdated ships can be divided into types below:

(1)The First Class Old Ships: high-speed passenger ship with over 10 years old age

(2)The Second Class Old Ships: Ro-Ro vessels, passenger-cargo vessels, passenger ferries, passenger-cargo ferries (include passenger train ferries), excursion vessels, passenger ships with over 12 years old age

(3)The Third Class Old Ships: tankers (include asphalt tanker), chemical cargo ships, liquefied gas carriers with over 12 years old age

(4)The fourth Class Old Ships: bulk-cargo ships, ore carriers with over 18 years old age

(5)The Fifth Class Old Ships: cargo ships, concrete ships, refrigeration ships, break-bulk carriers, multi-purpose cargo ships, container ships, lumber cargo ships, tugboats, pushing vessels, lighters with over 20 years old age.

Resource: http://www.msa.gov.cn/

Regardless of objective factors such as shipyard for the ship built, register of Classification Society , navigating zone, the less cost in purchasing ships, the longer service life of ships, and the less average acquisition cost to be. Therefore, this thesis introducing the concept of average acquisition cost. Average acquisition cost can be simply regarded as acquisition cost in service life of ships. The formular is shown as following:

Average acquisition cost = (acquisition cost - scrap value)/service life

Referring to data of Ningbo ships trade fair, two of the ship's sale information as

Table 5: Ship's Sale Information

NO.	Type of Ship	Dead weight	Classification Society	Building Year	Building Shipyard	Bills (Thousand RMB)
NB1174	Bulk carrier	20743	ZC	2008	NINGBO	45000
NB0469	Bulk carrier	23000	BV	2012	NINGBO	65600

Resource：Ningbo Ship Trading Market. http://www.nbship.net/cn/index.aspx

We can see from the table above that NB0469 has 4 years older than NB1174 in survive life, but 20600 thousand RMB much than NB1174 in selling price. According to evaluation of Ye Jianhuan, the vessel appraiser of Ningbo Zhongwei Ship Trade Co., LTD., this type of ship's dismantling price is about six million RMB.

NB1174: average acquisition cost=（45000-6000）/（33-6）=1444.4 million/year

NB0469: average acquisition cost=（65600-6000）/（33-2）=1922.6 million/year

Therefore, in terms of acquisition cost, ship-owners are inclined to older ships trade. But with the growing of age, there are more hidden troubles affecting ships operating with safety.

5.1.2 Ships Financing Model

Except for some common future of normal investment, shipping as a special industry, has a specialty of huge investment and long paybacks period. So, there is high risk as well as paybacks in ships mortgage financing. At present, banks and financial institutions in China have conducted this business. According to writer's experience, besides some state-owned banks, such as Industrial and Commercial Bank of China Limited (ICBC), Bank of China (BOC), etc, local joint-equity banks are more inclined to conduct the business of ships mortgage financing.

With the influence of international financial crisis, banks are more cautious in auditing items of ships' mortgage financing after a chaotic period. Banks are focusing on credit, repayment ability of ship-owners and flow of operating funds, and have paid less attention to quality and management of ships. For example, a joint-equity bank have audited mainly the credit of ship-owners in the past 5 years, capital flow of ship-owner and corporation in the past 3 years, freight contract in the next few years when they are conducting the ships mortgage financing business. At present, the interest rate for ships mortgage financing is 30% higher than the benchmark interest rate decided by the People's Bank of China.

Therefore, regardless of ships quality, substandard ships' owners are more inclined to invest on ships with high paybacks.

5.2 Analysis of ships operating cost

Ships operating cost is constant supporting expense for maintaining seaworthiness. Substandard ships seek higher investment paybacks and reduce operating costs, which has seriously affected the seaworthiness. Crew wages, spare parts cost, maintenance expense are the main operating cost and saving part of substandard ships. There is an analysis of the following three aspects:

5.2.1 Crew costs

Substandard ships have come into being for two reasons: hardware and crew members. With the development of technology, hardware and equipment of ships are achieving great progress as well as the standards of crew members. Although structure of ships and modification of equipment has greatly improved the safety of navigation, maritime traffic accidents still happen in an endless stream. The research has proved the risk of safety operating comes from crew members. 80% of the accidents have connection with human factor, such as direct operational error or misconduct after the accident, and the rest 20% are all related to hidden human factor more or less (Fu, Y. N, 2011, p. 50-52).

With the fierce competition in maritime industry, crew wages and welfares are rising. On 20th Aug, 2008, Maritime Labor Convention 2006 became effective officially, which has offered effective support and important policy insurance for decent labor of crew members. Compared with that of 2006 and before, crew wages have raised a lot.

For example, Table 7 is the crew's basic wage guidelines, who working in the bulk carrier, from the crew recruitment network.

Table 6: the Crew's Basic Wage Guidelines (unit: Dollar)

position	December 2008	October 2010	January 2014
master	3500	5600	7300
Chief officer	2500	4600	6800
Second officer	1600	2800	2900
Third officer	1200	2100	1500
Chief engineer	3000	5700	7100
Second engineer	2500	4900	6800
Third engineer	1600	2800	2900
Fourth engineer	1200	2100	1500
Boatswain	700	750	1000
Seaman	500	550	800
Crew chief	700	750	1000
Mechanic	500	550	800
Electrician	800	1500	2600
Cooker	800	1000	1000

Resource: http://www.crewcn.com/

We can see from the table above that in recent years, most crew members' wages have increased by a large margin; only the wages of third officers and fourth engineers are declining because of huge member available in China. Therefore, ship-owners are inclined to equip crew members fewer than the least limit to save crew costs. Some substandard ships' ship-owners change flags of flag states of substandard ships to avoid punishment. For example, a 3000 ton bulk carrier hanging

Cambodia flag only equip one chief engineer and two machinists, which are not in accordance with the rules.

5.2.2 Spare parts and materials cost

Vessels and its equipment all have service life. With the increase of operating time, abrasion of mechanical equipment is aggravating. The huge expense of spare parts and materials in the main component of ships expense, which is diversified according to ships condition. According to the statistics, a seventy thousand Dead Weight Tonnage (DWT) ship with a ten years ages, has annual spare parts and materials cost ranging from 300,000 to nearly 2,000,000 RMB. The spare parts and materials of a ten thousand DWT ship is about 200,000 RMB (Tan, Y, 2005, p.19). How to meet the requirement of spare parts and materials and save cost at the same time is an important problem that ship-owners and corporations have to face. Some substandard ships ship-owners reduce the equipment of spare parts and materials to save expense, even adulterate good with bad. For example, the price of Original Equipment Manufacturer (OEM) Model 3802747 CUMMINS piston ring is 350 RBM, while the non-OEM is only 250-270 RBM. The non-OEM piston ring's quality cannot be guaranteed and even lead to drawing cylinder for the first time. Owners of substandard ships skimp the expense of spare parts and materials, and crew members do not have strong sense of responsibility. The management of spare parts and material is in chaos and when in urgent time, it is usually difficult to find the spare parts and materials, which will cause a great loss.

5.2.3 Ship's maintenance cost

Speculating the ship-owners' state of mind, the purpose of operating ship is to pursue the maximization profit and minimization the cost. Unfortunately, for realizing to reduce the operating cost, the substandard ships' ship-owners usually cut the maintenance cost of ships, and operate the ships in the minimum requirements of national regulations and relevant conventions. Even more, some substandard ships are not seaworthy running, or robbing Peter to pay Paul. In practice, majority of the substandard ships are the older ships, which would throw into lots of financial and material resources to get the minimum standards of the domestic regulations or relevant conventions. However, the ship-owners do not to spend on the ship's maintenance, as this is not the best way for them to get the profit. Therefore, many substandard ship's ship-owners abandoned maintenance or repairmen for their ships, and take temporary measures to deal with the ship's faults. This is put the ships to the vicious cycle.

5.3 Analysis of the ship's voyage cost

As we can see from 4.3.2.3, the majority cost in ship's voyage is the fuel expense. With the increasing fuel price in recent years, the intention of decreasing fuel cost of ship-owners is stronger than ever before. Though there are many factors to influent the fuel expense, we only discuss the detention time wasted in ports. Under normal situation, the more time a ship wastes in the ports, the more fuel expense it spends. There are two reasons to support the conclusion. On the one hand, when the ships detained in the ports, the ships should consume fuel to maintain the normal operation. Take the crew's requirement for example, the ship should provide the survival environment for the crews, such as cooking, lighting, etc. On the other hand, if the ship wastes time in the port, it may lefts less time for the ships sailing on the sea. The ship should increase navigation speed to save time when sailing on the sea. But the

navigation speed and fuel consumption work out in cube relation. The faster the ship is, the huger the fuel consumption would be.

Chapter VI the Current Constrained Measures to Substandard Ships from MSA and Some Proposals

6.1The current constrained measures to substandard ships from MSA

In modern society, healthy and sustainable development has been the theme of human society progress, and safety is becoming the human's basic need of survival and development and any country's economic development can't survive without safety. As the basic industry of national economy, maritime industry are offering service for production and living of people, ensuring that shipping safety is the important link in healthy and sustainable development of national economy.

At the same time, maritime industry is at the bottom of economy after international financial crisis. As administration to carry on water traffic safety supervision, the maritime administration not only have to safeguard the stable security situation to promote the national economy development, but also hitting the substandard ships, non-compliance ships(no ship name, no qualified certificate, no registered flag) and illegal action against the water traffic safety. This thesis going to introduce some control measures of maritime administration against substandard ships:

6.1.1 Increasing the frequency of inspections to substandard ships

The maritime administrations take more scientific and reasonable measures in terms of inspection frequency to the ships, which can protect the high quality ships and concentrate force to eliminate the low quality ships (or substandard ships). The less inspection carried out by the Port State or Flag State, the more competition has to the

ships in the market. The less inspection frequency to ships is means that the ships can decrease berthing time on the ports, which can make the ships' operation costs gradually declined. However, the substandard ships do not have the rights to exempt inspection. On the contrary, the substandard ships take inspection more frequent than the high quality ships. The more inspection took, the more safety loophole would be found. Before the substandard ships heading to the next destination port, the ships should rectify and reform the safety loophole.

Take the new regime of Tokyo MOU to select target ships for PSC inspection for example, all ships in the information system of APCIS will be assigned either as high, standard or low risk based on generic and historic parameters (TOKYO MOU, 2013). The ship will be selected to inspect or not, would be based on its Ship Risk benefit to determine the frequency, priority and scope of inspections. In the Time Windows as Tokyo MOU NIR indicates that the Low Risk Ships would be inspected 9 to 18 months since previous inspection, the Standard Risk Ships is 5 to 8 months, while the High Risk Ships is only 2 to 4 months.

6.1.2 Linking up the company performance with the substandard ships

Ship managing company is the reality of ships to corporate management, which is the maritime industry, gets the subjective of specialized and standardized requirements. The main body for ship management duty has convert from ship-owners and charterers to independent professional company. No matter what kind of main body, they all have the responsibilities of safety, pollution prevention, and integrated management to their ships, and the support from the main body is not limited on the manpower, material resource, information, technology, etc.

To prevent the ship managing company's irresponsible behavior, IMO, China MSA and other relevant maritime organizations have formulate regulations and conventions in succession, such as ISM Code, ISMA Code, Domestic Ship management industry regulation, etc. In recently, PAIRS MOU and TOKYO MOU had introduced the company performance to PSC inspection. Take TOKYO MOU for example, company performance takes account of the detention and deficiency history of all ships in a company's fleet while that company was the ISM company for the ship. Companies are ranked as having a "very low, medium or high" performance. The calculation is made daily on the basis of a running 36-month period. There is non-lower limit for the number of inspections needed to qualify except a company with no inspections in the last 36 months will be given a "medium performance"(TOKYO MOU, 2013). In the NIR, the consideration elements are the detention index and deficiency. The regulations can prompt the companies to take the safety management and pollution prevention in one, and change the current situation that PSC inspection and company management audit fragmented.

6.2 Some countermeasures for China MSA to administrate substandard ships

6.2.1 Strengthening the cooperation with banks (or financial institutions), and enhance the cost of investment and financing for substandard ships.

Due to the huge investment of buying ships, overwhelming majority of the ship-owners should obtain loan from banks (or other financial institutions). The sum of loan almost is very huge amount. Once, the ship happen severe accidents on the sea, such as the sinking, the loss, etc, that the ship-owners bear the massive loss. However, the bank (or financial institution) may suffer loss because of the incapable repaying loans from the ship-owners. When determining to the lending to the ship

market whether or not, and how to resist the risk from the fulfillment contract from ship-owners, the banks (or other financial institutions) should not only depend on the benefit from ship's mortgage business. In other words, the banks (or financial institutions) should put their eyes on the quality condition of the ships and the management level of company as the ship belongs to.

Based on the analysis of the needs from banks (or financial institutions), the MSA and banks (or financial institutions) have the cooperation foundation. The MSA can provide ship risk level and the company's actual management level to banks (or financial institutions). For example, Ningbo MSA would inspect the shipping companies in Ningbo area and their ships every year, and evaluate the quality rating of the inspection targets. After then, the result of evaluation would open to the public. In a word, the MSA has the ability and technology to support the banks (or financial institutions) about the quality condition of the ships and the management level of company as the ship belonged to. However, the MSA wants to get support from banks (or financial institutions) tighten lending to the market of substandard ships. The banks (or financial institutions) also can increase the interest rate of loan to the substandard ships.

6.2.2 Strengthening the cooperation with the insurance companies, and add the coverage of insurance

Block insurance is one of the insurance categories, and its target is the different kinds of ships. The aim of block insurance is to assume ship's loss or responsibility compensation accidentally or naturally when the ships sailing on the water of berthing in ports. In practice, many ship-owners insure for their ships, but it is not foolproof, especially for the substandard ships. As we know that the substandard

ships is bad physical condition, and low quality of crews for their operation or activities. So, in terms of probability, the possibility of happening accident for the substandard ships is increasing. In my eight-year maritime work experience, I have seen the situation that the insurance company refused to the ship-owner's claim for compensation because of the ship-owner's violation of contract provisions. The excuse for the insurance company was the ship was not equipped with qualified crews to according with the requirements of the minimum safe manning certificate.

In word to avoid the situation of rejection compensation, the insurance companies can add types of insurance or increase the insurance rates for the ship-owners. There are two kinds of ships that should be insured the added insurance. The first one is the substandard ships, which are noticed by the MSA annually, and the second one is whose ship-owner had experienced of violating the contract provisions in the past five years.

6.2.3 Strengthening the cooperation with the shipping groups, and play its role in the maritime industry

With the continuous development of maritime industry, many inter-governmental or non-governmental organizations have been set up between governments and non-government groups, and the shipping companies also establish organizations for serving their business. The prominent shipping organizations are the Baltic and International Maritime Council (BIMCO), International Chamber of Shipping (ICS) International Shipping Federation (ISF), The Baltic Exchange (BE), etc,. These organizations play an important role in insuring the maritime safety, establishing the international conventions and providing shipping service, etc,. Take BE for example, BE published Baltic Freight Index (BFI) since 1985, and release Baltic Dry Index

(BDI) to alternative BFI from the January 1, 1999. The BDI has become a barometer of international dry bulk shipping market.

However, many of the organizations do not link the freight with the ship's quality condition, and many of the shippers only consider the freight that the cheaper the better. This encourage the substandard ships take the unfair methods to participate in the market, such as employing ineligibility crews, the actual DWT bigger than the certificate recorded, actual physical condition lower than relevant conventions required, etc,. So, the substandard ship can provide cheaper price than the high quality ships. The shipper only pursue the benefit while ignoring the risk of substandard ship's accident.

The cooperation between MSA and shipping groups, the MSA can provide the ships safety information while the shipping groups can alarm the safety information to its shippers. What will happen? It is the substandard ships that would lose its market.

Chapter VII Conclusion

This research attempts to explore a different way from the administrative measures for China authorities to eliminate the substandard ships. As we know that the existence of substandard ships is only the business for the ship-owners and/or relevant stakeholders. After many years' efforts, the substandard ships still exist in the shipping world. However, the substandard ships have the increasing growth and bring grievous marine catastrophes.

In order to find out the possibility measures to eliminate substandard ships, the writer has paid a visit to five companies in Ningbo region. Based on the interview, the writer has a conclusion that the target of ship-owners for operating substandard ships is to make profit. If the expenditure of operating substandard ships is more than the income, the ship-owners will give up the substandard ships. Otherwise the ship-owners will do this business. So, we can use the sword of economic market to break the spear of substandard ships.

If the authorities make use of the economic measures effectively, it will ensure to move the substandard ships' cheese. Then it will enforce the ship-owners put their eyes on the standard ships, if they still want to running shipping business. In a word, the economic measures will achieve following two objectives:

(1) To strike the substandard ships.

(2) To benefit the standard ships.

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