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WORLD MARITIME UNIVERSITY

Dalian, China

**Study on the Implementation Issues of
Seafarer's Onboard Training in China**

By

Shao Guoyu

China

A research paper submitted to the World Maritime University in partial
Fulfillment of the requirements for the award of the degree of

MASTER OF SCIENCE

(MARITIME SAFETY AND ENVIRONMENTAL MANAGEMENT)

2013

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: Shao Guoyu

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Title: **Study on the Implementation Issues of Seafarers
Onboard Training in China**

Degree: **MSc**

Abstract

This thesis explores the relevant requirement of international conventions and Chinese domestic laws, regulations with respect to seafarers onboard training, it investigates the successful practice and existing problems during the implementation of onboard training home and abroad, analyzing why the seafarers onboard training is difficult to solve in the implementation process, aiming to provide solutions for the effective implementation of onboard training in China, so as to enhance comprehensive quality of Chinese crew, promote sound development of maritime industry, and help to achieve the strategic goal of becoming one of the strongest crew providers in the world labor market.

Key words: seafarers; onboard training; quality; quantification; implementation

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List of Abbreviations

AMET	Academy of Maritime Education and Training
BP	British Petroleum
COSCO	China Ocean Shipping Company
CoC	Certificate of Competence
CBT	Computer Based Training
CHED	Commission on Higher Education
DMU	Dalian Maritime University
DNV	Norway Classification Society
GMDSS	the Global Maritime Distress and Safety System
ILO	International Labor Organization
IMO	International Maritime Organization
ISPS	International ship and port facility Security code
MLC	Maritime Labor Convention
MSA	Maritime Safety Administration
MTE	Middle Technology Education
Regulation 87	the Regulations on Examination and Certification for Seafarers of the People's Republic of China in 1987
Regulation 97	the Regulations on Examination, Assessment and Certification for Seafarers of the People's Republic of China in 1997
Regulation 04	the Regulations on Examination, Assessment and Certification for Seafarers of the People's Republic of China in 2004
Regulation 11	the Regulations on Examination and Certification for Seafarers of the People's Republic of China in 2011
Ro-Ro	Roll on Roll off ship
SMS	Safety Management System

SOLAS	the International Convention on the safety of Life at Sea
STCW	the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
VLCC	Very Large Crude Carrier

1 Introduction

According to the record of statistics of China seafarer annual report in 2012, China now has a total number of 533,719 seafarers, which is consist of 384,538 seafarers working on ocean-gonging ship and 149,181 working coastal voyage respectively (China seafarer annual report in 2012, p6). The existence of good quality teams of seafarers is the prerequisite of guarantee of sea bound trade, to promote maritime safety and pollution prevention. At present, the Chinese seafarers' comprehensive quality does not meet the standard of maritime authority even though its number is huge; especially it is hard to explain the fact of only 700,000 seafarers are working onboard foreign ships every year. This is disproportionate with Chinese trade volume and Chinese crew development strategy. In particular, the promotion requirement of seafarers' professional techniques also goes along with the advance of ships' automation, intelligence, and informatization. In addition, it is much more important to enhance onboard training compared with theory study on professional technique for seafarers. "The onboard training could put all theory knowledge into practice after they learn and understand the theory at school, however, the maritime authority is not optimistic with this as some crew's practical capability is still poor" (Song,2011,P44). The maritime authority is not satisfied with some seafarers' competence ,which is very closely related to seafarers training in China, in particular, most of them lack onboard training practice after theory training, this inevitably affects their comprehensive ability and operational capability when he (she) is on his (her) duty. This thesis discusses the method of implementation of onboard training both home and abroad, which is coupled with updated requirement of STCW 78 Manila amendment, MLC 2006, and domestic laws and regulations, and discuss some existing adverse aspects for seafarers' career development on the onboard training. By proposing the corrective action, promoting the level of onboard

training and meeting the requirement of international conventions, so that we can build a comprehensive crew team in sufficient quantity, good quality and reasonable structure for China, which can secure the safety of life and property at sea, protect marine environment, promote the healthy development of the maritime industry and improve the seafarers' international competitiveness.

2 The Requirements of the Relevant International Conventions for Seafarers

Onboard Training

2.1 The Regulations of ILO to Seafarers Onboard Training

2.1.1 The Background of Seafarers' Onboard Training

The senior seafarers' training and competency standards of International Maritime Labor Organization is from Twenty-first Session in Geneva on October 6, 1936, which session adopted some certain proposals with regard to the establishment by each maritime country of a minimum requirement for professional capacity in the case of captain, navigating and engineer officers in charge of watches on board merchant ships, and formed the convention concerning the Minimum Requirement of Professional Capacity for Masters and Officers on board Merchant Ships. The article 4.1 requires their professional experience to be of the minimum duration prescribed for the issue of the certificate and not detailedly talk about the professional experience that needs what contents of technology or onboard training. The Convention on Able Seafarer Certificate in 1946 allowed the able seafarer Certificate to them who were trained on the approved training ship at least 18 months and gained good performance before disembarking the ship for vacation (The Convention on Able Seafarer Certificate in 1946).

2.1.2 MLC 2006 Requirement for Seafarers' Onboard Training

MLC 2006 will enter into force on August 20, 2013, which rules the contracting states can carry out port state inspection to the arrival ship of the non-contracting states. In addition, the ships of the country which not ratified the convention will be

restricted and influenced by the convention too. There are relevant requirements of seafarers' onboard training on MLC 2006, which will lead to a series of significant impacts on the seafarer management, occupational safety and the recruitment and placement of seafarers and so on. Rules of seafarers' onboard training are as follows:

The Regulation 1.3 is about Training and qualifications, and its purpose is to ensure that seafarers are trained or qualified to carry out their duties on board (MLC 2006). The convention requires that seafarers shall not be permitted to work on a ship unless they have successfully completed the training for his personal safety on ship. In order to secure and retain decent work, to improve individual employment prospects and to meet the changing technology and labour market conditions of the maritime industry, each member should take some measures to promote his opportunities for further training and education of seafarers both onboard and ashore, and provide for skill exploitation and develop himself capacity in the guideline B2.8.1.

2.2 IMO Requirement for Seafarers' Onboard Training

2.2.1 The background of Seafarers' Onboard training

In IMO, the compliance and enforcement of the requirement for seafarers' onboard training in member parties is by the relevant provisions of the international conventions. New crew members should mainly receive onboard training about the knowledge of lifesaving and fire fighting equipment in SOLAS convention, and which puts forward some relevant requirements and standards on how to do the onboard training. STCW78 convention put forward the concept of onboard training later than SOLAS, the concept is added after the STCW78/95 amendment, the section A-II/1 of STCW proposed the on-board training in mandatory minimum requirements

for certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more, and the shipboard training plan must become a part of the whole training program that is emphasized in the guidance of the section B-II/1 too (STCW, 1995). On June 25, 2010, STCW78 convention assembly was held in Manila. The convention was reviewed and revised comprehensively, and kept the shipboard training content of the STCW78/95 amendment in the principle without lowering the standard of revision.

2.2.2 The Requirements of Officers' Onboard Training in STCW78 Manila Amendments

2.2.2.1 The Onboard Training Regulation of Officer

In the regulation II / 1 Mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more of STCW78 Manila amendment, it requires every candidate for certification shall have approved seagoing service of not less than 12 months as part of an approved training programme which includes onboard training that meets the requirements of section A-II/1 of the STCW Code and is documented in an approved training record book (STCW, 2010). Furthermore, during the required seagoing service, bridge watchkeeping duties should be performed under the supervision of the master or a qualified officer for a period of not less than six months. Also, it should refer to the choice of shipboard training officer, the organization, implementation, coordination and supervision of the training plan in section B - II / 1. There are two persons to be taken into account shipboard training officer, who, under the authority of the master, should organize the program of practical training at sea and supervise the program of training for the duration of each voyage,

other one is company training officer, who, nominated by the company, should have an overall responsibility for the training program and monitor the progress of the prospective officer throughout and ensure that all concerned with the training program play their parts.

In the regulation III/I Mandatory minimum requirements for certification of officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room, every candidate for certification shall have completed combined workshop skill training and an approved seagoing service of not less than 12 months as part of an approved training program which includes onboard training that meets the requirements of section A-III/1 of the STCW Code and is documented in an approved training record book, moreover, during the required seagoing service, engine-room watchkeeping duties should be implemented under the supervision of the chief engineer officer or a qualified engineer officer for a period of not less than six months(STCW, 2010).

2.2.2.2 The onboard training requirement of ratings as able seafarer deck

The ratings as able seafarer deck should carry out onboard training besides special training or experience, and the onboard training should be documented in an approved training record book in Section B-II/5 guidance.

2.2.2.3 The Onboard Training Requirement for Seafarers on certain Types of Ships

Chapter V Standards regarding special training requirements for personnel on certain types of ships of STCW78 Manila amendments requires seafarers to execute the onboard training for obtaining the relevant certificates, and consider the guidance

and standard of onboard training, the organization, implementation and management of training program on liquid cargo ship in section B-V/1.

In the regulation V/1-1 and V/1-2 of Annex , the Mandatory minimum requirements for the training and qualifications of masters, officers and ratings on the liquid cargo ship are that Masters, chief engineer officers, chief mates, second engineer officers and any person with immediate responsibility for loading, discharging, care in transit, handling of cargo, tank cleaning or other cargo-related operations on liquid cargo ships shall hold a certificate in advanced training for liquid cargo ships cargo operations. Every candidate for a certificate in advanced training for liquid cargo ships cargo operations shall meet the requirements for certification in basic training and the approval advanced training for cargo operations, who shall have at least three months of approved seagoing service or at least one month of approved onboard training on liquid cargo ships in a supernumerary capacity, which includes at least three loading and three unloading operations and is documented in an approved training record book.

2.3 The onboard training requirement of 1974 SOLAS convention

The appearance of SOLAS convention was a great event in the navigation history of the world, and it sets up the international technology standards of the navigation history, puts forward the international minimum standards of maritime safety. In order to improve the safety of life at sea and reduce the pollution of the marine environment, besides the shipbuilding standards, the requirements of seafarers' onboard training are added to the operation of the crew familiar with ship equipments.

Regulation 15 of chapter II in SOLAS consolidated edition 2009 has the relevant provisions on the onboard training about fire fighting to the seafarers. The provision of 2.2 On-board training and drills require that crew members shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any fire-fighting systems and appliances that they may be called upon to use.

The on-board training shall include the trainings on the use of the emergency escape breathing devices, moreover, Performance of crew members assigned fire-fighting duties shall be periodically evaluated by conducting on-board training and drills to identify areas in need of improvement, to ensure competency in fire-fighting skills is maintained, and to ensure the operational readiness of the fire-fighting organization (SOLAS, 2009).

Emergency training and drills in article 19 of chapter III has some the provisions of onboard training for new crew members joining the ship, who shall receive the on-board training and guidance about the use of the ship's life-saving appliances, including survival craft equipment and in the use of the ship's fire-extinguishing appliances as soon as possible but not later than two weeks. However, if the crew member is on a regularly scheduled rotating assignment to the ship, he shall obtain such training no later than two weeks after the time of first joining the ship. The different parts of the ship's life-saving and fire-extinguishing appliances may be covered in individual instruction, but all the ship's life-saving and fire-extinguishing appliances shall be covered within any period of two months (SOLAS, 2009).

If the liferafts is launched by the davit on board, this onboard training shall take place at intervals of not more than four months on every ship fitted with such

appliances. In addition, the record of onboard training in the use of davit-launched liferafts shall be written into such log-book as may be prescribed by the Administration.

3 The provisions of the Chinese seafarers' onboard training

China is the recognized big shipping country and the big seafarers supply country in the world, as one of the parties to the international convention. According to the provisions of the Convention, China has the duty to comprehensively, fully and effectively implement the conventions. In order to implement the Convention, improve the technical quality of seafarers, guarantee the safety of life and property at sea and protect the marine environment as well as promote the development of the shipping industry, Chinese government and the competent authority of seafarers in China has formulated a series of relevant policies and regulations according to the international conventions and standards, especially the Chinese seafarers' onboard training.

3.1 Related provisions of the Crew Training Rules

The Crew Training Rules of the People's Republic of China is the first domestic regulation concerning the seafarers' onboard training and was promulgated on November 5, 1997. The purpose is to strengthen the management of seafarers training, ensure the training quality, improve the crew occupational qualification, ensure the safety of lives and property at sea and protect marine environment. As stipulated in twenty-eighth rules of the Regulation, company and the ships carrying out the training, should ensure both the safety of ships and normal operation at the same time, and guarantee the master and officers to have adequate time and energy to be engaged in the corresponding onboard training work who in charge of teaching and directing the work. Article twenty-ninth points out that the ship training company should make the ship training plan, procedures, standards and implementation plan, establish the quality standard system which has been

authorized, and ensure the project objectives and demands of "onboard training record book" be effectively implemented in accordance with the provisions of the competent authority. At the same time, Article 30 requests the shipping company to deliver the list including students' roster and qualifications of masters and senior officers who guide and train students to maritime administration for record, which can be used as the tracking and verification of the crew probationary status. Till October 1, 2009, the new Crew Training Rules of the People's Republic of China revoked and replaced the old one, but new one has no regulations on the onboard training.

3.2 Management approach of onboard training

The specialized management approach for the crew onboard training was established in 2000, namely "Management approach of onboard training of the people's Republic of China" in accordance with the relevant requirements of international conventions and domestic crew management regulations, in which specific provisions are made considering the definition, conditions and requirements of shipboard training.

3.2.1 The definition of onboard training

The onboard training refers to a comprehensive training for seafarers applying for the certificate of competency (CoC) of third mate, second mate, third engineer and second engineer and the duty fieldwork after the theoretical examination for seafarers who apply for the CoC of master and chief engineer.

3.2.2 Requirements of onboard training

After crew completed the corresponding training, examination and evaluation on shore, before achieving the CoC, seafarer who need onboard training has to participate in the comprehensive practical training under the supervision of captain and officers and take the “onboard training record book” or “ship probation record book” on board. If training time is lacking, training content is not completed or not according to the requirements of onboard training record book for training, the seafarers are asked to complete the training time and the training content in order to be able to apply the corresponding certificate of competency.

In this way, onboard training is an important part to enable seafarers to achieve a competent standard of the overall training plan, and an important means to improve the seafarers' occupation skill by the combination of the professional theoretical knowledge and practice, as well as an effective method to objectively evaluate the competence standards of seafarers.

With the development of navigation technology, the training content and the ways need to be advanced with the times, and Chinese authorities have revised the crew training management approach according to the new standard STCW78/10 conventions, based on the old one.

3.3 The relevant provisions of onboard training in Rules on Examination and Certification

The management for seafarers to obtain the corresponding certificate of competency began in the 1950s, and it was from 1987 that the regulations on examination and certification for seafarers really developed in line with the international conventions. The latest promulgated regulations on examination and certification for seafarers on

March 1, 2012 has been amended for 3 times in the past 25 years. The Chinese government has paid more attention on the implementation of the convention and the competency comprehensive training of seafarers by the corresponding requirements of the onboard training in every version of regulations.

3.3.1 Onboard training in Regulation 87

According to STCW78 convention, our government established the “Regulations on Examination and certification for seafarer of the people's Republic of China” in 1987, (herein after referred to as the Regulation 87). Maritime university graduates must be on ship for not less than 12 months or 18 months fieldwork and write the internship report after the national unified certificate examination, before getting the CoC issued by the competent authority (Zhou, 2001, p.68).

3.3.2 Onboard training in Regulation 97

In order to perform the STCW78/95 convention, China's maritime authority promulgated on November 5, 1997 the revised “Regulations on Examination, Assessment and Certification for seafarers of the people's Republic of China” (hereinafter referred to as the Regulation97), based on the “Regulation 87”, which divided the seafarer standards into three parts: Training practice, theory test and onboard training. “Onboard training” requires the applicant in accordance with the provisions of this regulation, after the completion of the professional education, corresponding training, examination, assessment ashore, undertake and complete the comprehensive practical training under the supervision of the master and qualified senior officers before getting the CoC(Certificate of Competence). Only by passing the practical evaluation can the applicant participate in the examination of the

navigation theories, and complete the prescribed time for the onboard training and then receive the CoC issued by the competent authority.

Regulation 97 stipulates that the seafarers pass the examination and assessment should complete onboard training or practice for 5 years. As for the one passing the third mate/engineer examination and assessment, should complete the training on board for not less than 12 months holding the onboard training record book issued by the harbor superintendence administration (the ones participate directly the examination and evaluation in the school should complete for not less than 18 months) according to training project and content of the onboard training record book. Six months of 12/18 months are the implementation of duties in the bridge or the engine room under the supervision of qualified senior officer or the captain. In addition, one passing the competency examination and assessment of the captain, chief officer, chief engineer, 2nd engineer and GMDSS radio operator, should complete no less than 3 months corresponding duty onboard training, holding the onboard training record book issued by the harbor superintendence administration.

3.3.3 Onboard training in Regulation 04

Regulation 04 is short for “Regulations on Examination, Assessment and Certification for seafarers of the people's Republic of China”, which entered into force on August 1, 2004, and has changed partly compared with the “Regulation 97”, such as chief officer, second engineer, GMDSS radio operator who worked in the oceangoing area or Near-coastal voyages and passed the competency examination and assessment of expanding the navigation area and increasing the tonnage or power do not require the onboard training. As for the applicant that passes the competency examination and assessment of master and senior seafarer working in

offshore area, should be trained onboard with related duties for no less than 3 months in 5 years.

In addition, new requirements for onboard training are increased for the passenger and Ro-Ro passenger ship crew, the officer and the captain that need to complete the shipboard training or practice of the corresponding duty for not less than 3 months. Only by doing so, they can serve on Ro-Ro passenger ship. Especially for the applicant passing the third mate/engineer of passenger ships or ro-ro passenger ship, 18 months are requested for onboard training.

The master, senior officers, able seafarer deck, able seafarer engine apply the CoC of a certain type liquefied cargo ship for the first time, should have the onboard training for not less than 3 months after obtaining the special training certificate

3.3.4 Onboard training in Regulation 11

Regulation 11 is short for “Regulations on Examination and Certification for seafarers of the people's Republic of China”, which entered into force on March 1, 2012, and are more similar to the STCW 78/10 in the content and standards compared with all of the above Regulations. The related requirements on the master, senior officers and crew of passenger ships (including Ro-Ro passenger ship) are maintained as the Regulation 04. Requirements of onboard training of liquefied cargo ship are stipulated in the management approach of certificate of proficiency.

3.4 Provisions of onboard training in the management approach of certificate of proficiency

Before the latest management approach of certificate of proficiency (that is, the management approach of certificate of proficiency for Seafarers of the People's Republic of China implemented since March 1, 2012), regulations on shipboard training or practice is not very clear. After its entry into force, a clear qualification requirement of onboard training and practices of applying for proficiency in lifecrafts and rescue boats revised in the STCW 78. Six months onboard training or practices are required for those who passed the examination and assessment of lifecrafts and rescue boats, while one month corresponding practices and no less than three loading and three discharging operations should be exercised by those who apply for the advance training for certificate of proficiency of liquefied cargo ships.

3.5 Training requirements for seafarers on certain types of ships

There are various kinds of seafarers training and certification management approaches due to the different types of seafarers in China, like inland river seafarers, fishermen and crew of aquatic products carrier and so on. The standards of onboard training are different in the different approach for the crew to apply for certificates of sea-going ships crew.

For the inland river shipping service, only by onboard training or internship in accordance with the provisions of the seafarer examination and certification regulations, can the seafarers holding three or above the inland ship CoC or the crew holding the general telegraph operator or first class telegraph operator certificate, apply for the issuance of the corresponding CoC concerning categories, grades and duties. Fishery crew can apply for the issuance of the corresponding CoC concerning categories, grades and duties based on the onboard training and practices after passing the examination and assessment in accordance with the requirements of

corresponding transitions. Seafarers working on aquatic products carrier can directly apply for renewal without onboard training or practices if they pass the examinations and assessments of the seafarer's competency certificate or cancel the competency certificate limits.

4 General Requirements for Seafarers Onboard Training in Foreign Shipping Companies or Training Institutions

The world's major shipping companies generally have the more mature management of seafarers training institutions themselves, distinct means and methods of training, different standards of onboard training plan is established for better familiar with the ship operation and competent job requirements in the training process accompanying the development of the national legislation and the international shipping industry.

4.1 Japan Kawasaki Company (K-LINE)

Kawasaki Kisen Kaisha Ltd Japan, as one of the three major shipping companies in Japan, is the world's famous shipping company and has its own training center, respectively, in Tokyo and Manila. One function of the training centers is arranged for the training plan for the senior seafarers on the new ship (such as officer), especially on the ship with multi-nationality crew onboard. The company arranges three months onboard training involving the duty of on watch, the ship operations manual learning, practical operation and onboard writing. Three months' onboard training will strengthen the basic knowledge and skills of senior officers on duty and make them involve in the Safety Culture environment of the company.

4.2 Danish Maersk Inc (Maersk)

Maersk shipping company (MAERSK), known as the world's biggest shipping company, (<http://wenku.baidu.com/view/48e21c212f60ddccda38a0b3.html>)

Students are trained with the education mode in the company with the sandwich type lasting 3 to 4 years. For example, for the deck cadets, the first stage of training is the

AMET (Academy of Maritime Education and Training), the second stage is training at the sea, while the third stage of the land-based training in Singapore's Polytechnic. After completing the whole training program, the students will acquire NVQ3 (third grade National Vocation Qualification) deck officer certificate issued by the Maritime and Port Authority of Singapore and Higher National Diploma for Nautical Studies and become a senior officer of the Maersk's fleet.

4.3 Onboard training of seafarers in Holland

Holland's MTE system is cultivating the bi-functional crew, with general education before entering the school for four years: in the 1st year, ordinary courses and professional courses; in the 2nd year, specialized courses; in the 3rd year, onboard training; and in the 4th year, professional course, they are required to write papers and special content. The duty officer certificate can be obtained by the students after three years and the CoC of master (all without examination) can be achieved in four years. The advantages of this training mode are providing the more opportunities for the trainee to be recruited and making the seafarers more adaptable to the high level of the modern ships.

4.4 Seafarers onboard training in BP (British Petroleum group)

BP (British Petroleum) group headquarters in London is the largest oil and petrochemical products company in world, the third largest charter companies of oil transportation, as an important part of business of BP, that shipping groups takes all the transport business. So far, the fleet of BP shipping group has fifty vessels to transport crude oil, refined oil products and liquefied natural gas (LNG).

(http://www.eworldship.com/html/2013/ShipOwner_0108/64686.html) In order to

guarantee the competency ability of the employed crew, BP shipping group establishes a set of training plans for training crew members from all over the world ,who are servicing in their fleet. Especially involved in the use and operation of the particular equipment or facilities need training on board, there will make some practical training projects in the training system, such as lifting facilities using(Han,2010,p36). At the same time, for minimizing the crew prejudice by piracy, terrorism and smuggling, etc, the group also issued the special ship security management standards under the framework of ISPS, and required crew to do practical exercises in allusion to the standards, perfectly combined theory with practice together on the ship.

5 Training Requirements on Seafarers of Domestic Shipping Companies and Training Institutions

In addition to complying with the training requirements in the STCW convention, the major shipping companies have developed a series of onboard training requirements concerning different ship types of the company, and onboard training progress and requirements in order to improve the comprehensive quality and maintain sustainable competence of seafarers. Domestic maritime colleges also have developed a corresponding onboard training content for training students' ability to adapt to life on the sea, and realize the transition of the students from school to the firm. The students are trained to inherit excellence traditional of Chinese seafarers such as working hard, perseveringly exercising and quick-witted character, to cultivate the moral character of mutual cooperation, mutual help and law-abiding, and become both qualified seafarers and comprehensive shipping talents with scientific and cultural knowledge. The representative measures for implementation of onboard training are introduced as follows:

5.1 Regulations of onboard training of COSCO Dalian branch

COSCO Dalian branch, founded on January 1, 1978, is large-scale shipping enterprise of China COSCO (Group), and is the only specialized transportation Company based on liquefied cargo transport in COSCO Group. Now the company owns and operates more than 40 oil tankers and liquefied gas ships, of which there are over 20 VLCC, about 8000000 DWT, and the scope of business has covered more than 300 ports in more than 70 countries and regions worldwide.

<http://www.coscodl.com/chinese/about/jianjie.htm>

Due to the particularity of the shipping company, great attention has been paid to the

training of seafarers and onboard training with a series of shipboard training requirements and implementation methods.

5.1.1 The definition of onboard training

5.1.1.1 Onboard training definition

Onboard training refers to all training on the ships that is owned / operated and managed by the company, including onboard planned training, emergency training and exercise onboard ships and the training of onboard management changing.

5.1.1.2 Onboard planned training definition

Onboard planned training refers to the training for crew on the ships that is owned / operated and managed by the company is designed to meet the health, safety and environmental management system requirements, and continuously improve business skills according to the training plan.

5.1.1.3 The definition of emergency training and exercise on board

Emergency training and exercise on board refers to the teaching, training and drill for crew on the ships that is owned / operated and managed by the company is carried out to meet SOLAS requirements and improve rescue, fire protection, pollution prevention and other emergency skills according to the plan,.

5.1.1.4 The definition of the training of onboard management changing

Training of onboard management changing refers to the unplanned training for crew on the ships that is owned / operated and managed by the company is to meet the requirements on the health, safety and environmental management system due to management programme changing.

5.1.2 Functional division of onboard training

Human resources department is responsible for crew training management. Technical department and General department are responsible for onboard training supervision, guidance and support, actively collecting the latest available materials and courses for onboard training, and put forward the annual training focus with reference to the feedback on training, training effect evaluation results and consideration on the future development of company training and the need analysis on the crew promotion. The captain is responsible for the onboard training, plans and implementation of training, including evaluating training effect and establishing onboard training file, as well as applying for the additional shore-based support to the companies' management department.

5.1.3 The specific measures for the implementation of onboard training

5.1.3.1 Scope of onboard training

Onboard training plan consists of two parts: whole training plan and department training plan. The master is in charge of the former one concerning its formulation, implementation and supervision, while the latter one is in the charge of the chief

engineer and chief officer taking into account the formulation, implementation and is approved by the master. The captain, chief engineer and chief officer should adjust the whole ship training plan or department training plan when necessary according to the judgment and evaluation of their own in order to adapt to the different training needs of onboard personnel, routes and change of other conditions. The adjustment of Department training plan shall be subject to audit and approval of the captain.

5.1.3.2 Content of onboard training

The whole onboard training plan and department onboard training plan for every month should have no less than 6 months, and focus on the following aspects: keep improving the health, safety and environmental awareness of the ship crew, personal safety and risk prevention, ship maneuvering, business skills and executive ability in goods and equipment operation need as well as the proficiency of English within their scope of business.

5.1.3.3 Materials for onboard training

The VIDEOTEL, CBT training materials provided by the company should be used in the implementation of onboard training plan, like the convention, the ship's regulations, industry standards, health, system documentation of safety and environmental management, various manual or instructions, instruments, equipment and equipment. The captain, chief engineer and chief officer are responsible for the management of the ship training files, which are kept for 3 years.

5.2 Regulations of onboard training of Ro-Ro Shipping Company

China Shipping Passenger Transportation Limited Company is the directly under state-owned branch of China Shipping Group, which is a specialized marine passenger transportation enterprises, has 8 large luxury Ro-Ro passenger ships, and its main task is in the charge of the transportation of passengers and vehicles in the coastal ports in China. Since the Ro-Ro passenger ship carries many passengers, so it is very important to guarantee the safety of the ship, and the company requirements for training the crew is also relatively strict. The onboard training is divided into the Familiarization training for newly recruited crew and Training for the onboard seafarers.

5.2.1 Familiarization training for newly recruited crew

The Familiarization training for newly recruited crew is in the charge of the master to organize the SMS related training or be authorized to the Department executive. The training should be finished within 24 hours and the main contents are:

- 1) Captain's instructions before sailing;
- 2) Roles and responsibilities of muster list;
- 3) Emergency musters and escape routes;
- 4) Basic knowledge of fire extinguishing and methods used with portable fire extinguisher;
- 5) Alarming method.

As for the key equipment, the operators should carry out the field operation; explain the main performance, the matters worthy paying attention and the fault emergency treatment to achieve the correct operation. All the training should be recorded in the "SMS familiarization table" and "Training records" of the newly recruited crew.

5.2.2 Training for the onboard seafarers

The captain is responsible for setting the annual training plan, organizes and implements the training for the onboard seafarers. Due to the special characteristics of passenger transport and routes, the captain has the responsibility to adjust the training plan according to the actual situation, and adopts generally either the centralized or decentralized way to train the crew onboard.

The main contents are:

- 1) The international or domestic mandatory Convention, Rules, Regulations, and the Regulations, Guidelines and Standards recommended, applied by IMO, competent authority, Class Society and Marine Industry Organizations;
- 2) Familiarization of distinct types of ships and equipments, the changes of the external conditions;
- 3) Updating of the knowledge of the SMS related personnel;
- 4) Emergency treatment;
- 5) Treatment of the accidents and incidents;
- 6) Requirements on corrective measures of non-conformity.

All training should be recorded in the “Records of onboard training”, and be assessed by the captain with the examination, enquiry, operation and test etc. For those not satisfy the participated results, additional training should be arranged to achieve the satisfactory results.

5.3 Onboard training for marine students of DMU

Dalian Maritime University as a famous Chinese maritime university is as one of the International Maritime Organization recognized with "international reputation" of the maritime institutions worldwide. In 1998, the school quality management system was approved and certificated by the Maritime Safety Administration of the People's Republic of China and the Norway Classification Society (DNV), and has become

China's first university acquiring the ISO9001 quality management system certification and three DNV certifications. Based on the requirement of cultivating marine talents, university should combine theory learning with onboard training to ensure the integrated service ability and comprehensive development of students majoring in navigation, and try to strive to cultivate high-quality talents in china. Training of the navigation major students on board ship is divided into part two: onboard cognition practice training and onboard graduation practice training.

5.3.1 Onboard cognition practice training

5.3.1.1 Purposes of onboard cognition practice training

Onboard cognition practice training is the first onboard training, which is arranged in the middle of university, as an important link for the students of navigation technology major to know the ship, sea. With the explanation by field officers or teachers, students will better understand the maritime transport, marine main technical data and ship equipment function. Besides, students are required to master the ship working principle, which enables them to have the profound understanding of the theory they are to study in the future, and help them be familiar with the navigation circumstance and improve the seafarers' consciousness, and make a certain base for further fitting the future life at sea.

5.3.1.2 Content of onboard cognition practice training

The onboard cognition practice training will be held for four weeks, and there are different practice training on board for students because the navigation function is divided into different subjects. The main contents are:

1. The onboard cognition practice training for navigation technology major

Students are required to deeply understand the ship structure, ship equipment and navigational equipment function, preliminarily master navigational watch and navigation positioning method in the training.

2. The onboard cognition practice training for marine engineering major

Students are required to understand all kinds of machinery and equipment of the basic structure, working principle, operation management of ships, and carry out the engineer guidance and on-site teaching, initial training for turbine management skills.

3. The onboard cognition practice training for ship Electro-technical engineering major

Students are required to understand a variety of Electro-technical equipment of the basic structure, working principle, operation management, and carry out the preliminary training concerning the Electro-technical technology on board.

5.3.1.3 Requirements and assessment of onboard cognition practice training

1. Strictly carry out onboard cognition practice training according to the ship training program and planning practice;

2. Before the end of the onboard cognition practice training, everyone must write personal training summary report;

3. The guidance teacher will give an assessment result due to the daily record and individual training report of onboard cognition practice training, which shall be written into the their training records too.

5.3.2 Onboard graduation practice training

5.3.2.1 Purposes of Onboard graduation practice training

Onboard graduation practice training should be based on the principle of integrating theory with practice, have a training set according to the training target and training program for all professionals, and is an organic part to accept the training process of navigation teaching for senior officer. Students should have a comprehensive understanding and grasp the ship related knowledge with the training, and be adapted to the life at sea; realize the transition from school to the industry in order to be a qualified crew with better understanding of shipping business and the world.

5.3.2.2 Contents of Onboard graduation practice training

The Onboard graduation practice training will be held for 18 weeks, the main contents are:

1. The Onboard graduation practice training for navigation major

With the guidance of officer and teacher, Navigational students should further study the business of watch on sailing and watch on berth, such as navigation, positioning, avoidance, loading and unloading operations, and learn to solve the relevant issues of the maintenance and management of ship and equipment, and improve the ability to analyze problem by the use of the professional knowledge that they have learned.

2. The Onboard graduation practice training for turbine engineering major

Under the guidance of teachers, students of Marine engineering majors should participate in the cabin, machine equipment and facilities management, maintenance repair and technical innovation, practical work according to requirements of Onboard graduation practice training, learn skills in practical work, and further deepen use of

turbine professional theoretical knowledge learned, in order to improve the level of practice, problems analysis ability.

3. The Onboard graduation practice training for ship Electro-technical engineering major

Under the guidance of Electro-technical officer and teachers, students in Electro-technical major should learn and master the maintenance and repair job of the main Electro-technical equipment, refrigeration equipment and deck equipment, ship integrated bridge communication and navigation systems, ship electric propulsion system, marine emergency equipment and so on, and improve the ability to analyze the problem and the ability to solve practical problems in the onboard training.

5.3.2.3 Requirements and assessment of onboard graduation practice training

1. Strictly carry out the onboard graduation practice training according the training requirements and plan;
2. Before the end of onboard graduation practice training, each person should use the basic and professional knowledge they have learned to put forward the in-depth research, write papers, exercise and develop them, and have preliminary scientific research ability.
3. The captain, the ship's senior officers or teachers conclude the assessments based on the daily record and the reports of personal onboard graduation practice training, and students would not be allowed for the thesis or graduation without satisfying the requirements of the training.

5.4 Onboard training times for the seafarers home and abroad

Onboard training time is not the same in different countries for a senior seafarer to acquire the CoC by participating the trainings, like nautical knowledge training and onboard training. This thesis will compare training time and onboard training between the seafarers in China and abroad.

Table 1- Comparison of Training Time and Onboard Training between the Seafarers in China and Abroad

Country	Training time/year	Onboard training time
Germany	4	12months (6months in first year, and6 months in third year)
Sweden	4	16 months (4 months every year)
The UK	4	12months (third year)
Holland	4	12months (third year)
India	3	15 months (3months in second year, 12minths in fourth year)
China	4	12months (fourth year)

Source: Que, A.M. (2004, September).Unpublished master's research paper, Dalian Maritime University, Dalian, China

As illustrated in Table 1, the training time for Chinese seafarers is not much and the onboard training is carried out after all the theory has been learnt. As for the training mode, the “sandwich style” is much better since this kind of mode will help cultivate the crew to better adapt to the requirements of the occupation, with strong

practicability, and deep theory combined with high practice skills.

6 The existing problems of Chinese seafarers' onboard training

To become one of the world's shipping powers, the competence and quality of senior officers is a key factor in deciding if Chinese crew have the capability to serve the international market, facing fierce international competition, Chinese crew quality problem is still a long-term bottleneck problem in our crew service industry, the main factors affecting the onboard training can be summarized as follows:

6.1 The opportunity of crew onboard training is not enough

6.1.1 Numbers of Navigation Students grow sharply

To meet the needs of the fast development of shipping industry, China need to build a great number of seafarers with comprehensive high quality, strong competence. The major ways of crew training in China is mainly through training in maritime college and various training institutions. The navigation is a specialized major which concentrates on practice. Facing with the rapid increase in enrollment in most nautical academy, how to guarantee the quality of practice teaching hours and teaching quality has been a major concern to maritime industry. (Bao, 2007, p71)

The National Maritime institute enrollment continues to grow since 1990s, but gradually drop in the past two years. the number of ships is relatively reduced since the 2008 world economic crisis, the consequence of nautical graduates increasing which resulting in oversupply make the onboard training very difficult to meet maritime authority's satisfaction .

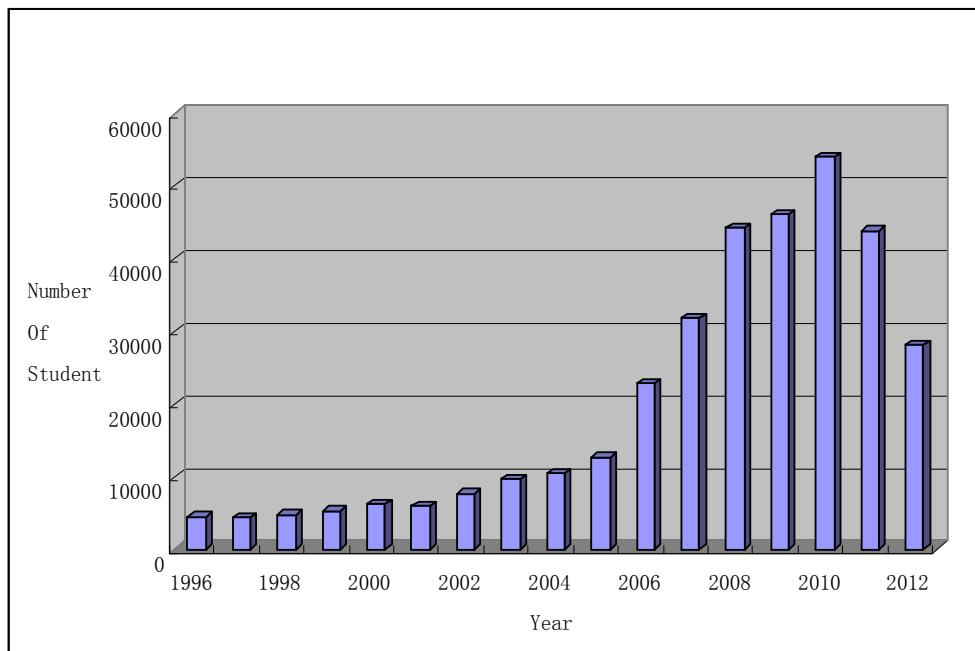


Figure 1- Enrollment of Navigation Majors from 1996 to 2012

Source: China Seafarer Annual Report in 2012

Figure 1 statistic shows, the enrollment number in National Institutes increased from 4,446 in 1996 to 53,996 in 2010, an increase of 11.1 times, the most significant increases occurred in 2006, 2007 and 2008, compared with the previous year, the number of students increased by 10,093, 9,127 and 12,398, the annual enrollment rate increase of 79.52%, 40.06% and 38.85% respectively. The peak number appeared in 2010, up to 53,996. The number of enrollment began to decline since 2011, the number of new students were 43,913 in 2011 and 28,160 in 2012, drop 18.67% and 35.87% respectively compared with the previous year.

Currently, there are 76 colleges and institutions engaged in seafarer education and training, annually capable of graduating 28,000 seafarers. In 2012, seagoing ships seafarer competency examination and assessment were held for total 249,601 people

-times, and 150,582 competency certificates were issued.

6.1.2 COC application increase after onboard training or internship

A substantial number of ship officers apply for new or renewal certificates after onboard training or internship every year in China, according to the statistics, the issuing quantity of COCs in last ten years shows the number of seafarers in China growing in a very fast pace, and the growth rate of ship quantity is far behind the increasing rate of new crew numbers, which makes it difficult to meet the basic requirement of onboard training.

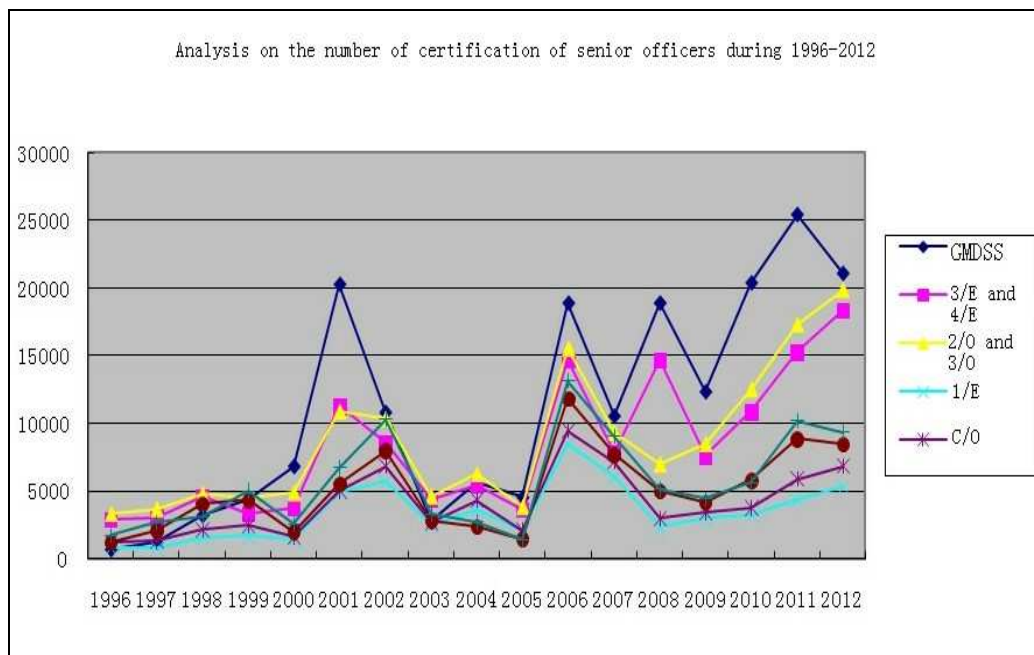


Figure 2- Certificates Quantities of Officers COC from 1996 to 2012

Source: China Seafarer Annual Report in 2012

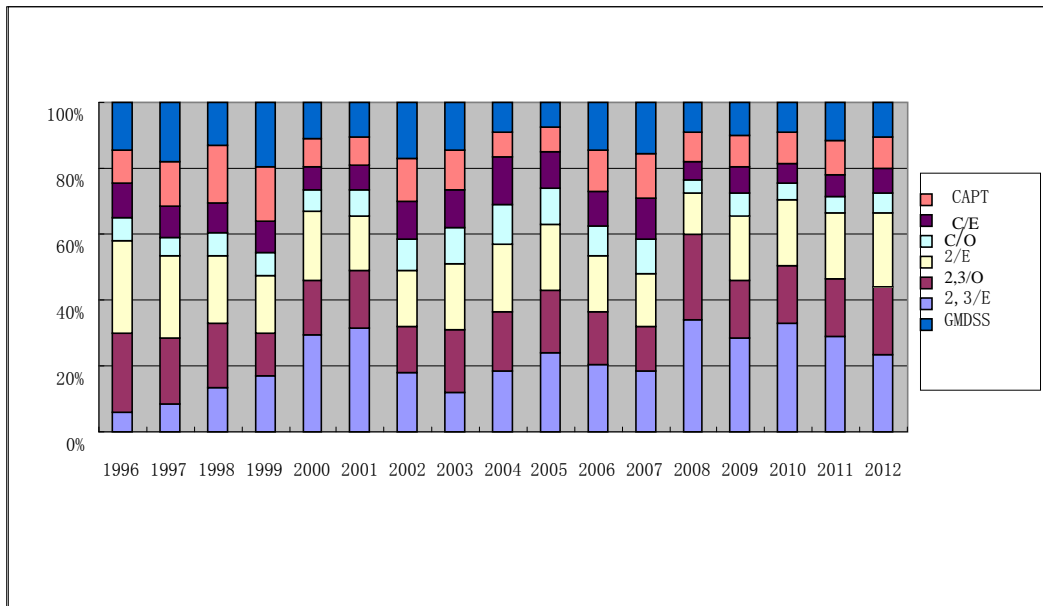


Figure 3- Certificates Analysis of Officers COC from 1996 to 2012

Source: China Seafarer Annual Report in 2012

In 1996, the issuing number of second, third officers and third/ fourth engineers certificates were 691, 2,882 and 3,322, which make up of the total issuing quantity in 24.2% and 27.9%; after 16 years of volatility increase, by 2012 the number of second/third officers and third/fourth engineers certificates issuance increased to the 18,333 and 19,822, with an increase ratio of 20.5% and 22.2% of the total issuing quantity. Since 2010, second/third officers and third / fourth engineers' certificates issuance quantity grow steadily. In 2010, 2011 and 2012, second/third officers' certificates issuance increased by 43.1%, 40.1% and 20.3% respectively; third / fourth engineers certificates increased by 47.5%, 38.3% and 14.7% respectively. Compared with the same period, the issuance quantity of the captain, chief engineer, chief officer and second engineer certification is relatively unchanged, after the 3 years continue growing issuance of captain and chief engineer licenses since 2009, in 2012, the issuance quantity decreased by 8.1% and 4.4% compared with the previous year.

6.2 The effect of onboard training is not to Maritime authority's satisfaction

6.2.1 Onboard training records are fake

"The ship training record book" is to provide the only evidence of an organized onboard training plan has been completed. It is the basis of evaluation of trainee's competency, issued COCs, and it has been noticed that part of the crew training records are not real, as the crew training time is written in the sign on and sign off column. The maritime administration has no better effective way to distinguish fake service record from real, so the length of training time, and true or fake service record, solely depends on the captain conscious.

Although the relevant laws and regulations in China such as "Regulations of the people's republic of China on seafarers" provisions fifty-eight says: if a captain could not fill in the seafarer's service book faithfully according to crew's service time and performance, a fine of 2000 Yuan to 20000 Yuan shall be imposed by the maritime safety administration; if the circumstances are serious, COC will be detained for 6 months to 2 years until revoked (Regulations of the people's republic of China on seafarers, 2007).

But in the real life, the falsified time of service, or the intentional elongation of service time circumstances happened and repeated again and again even though prohibited, the unreal fill in time is also reflect that the onboard training is not implemented well, thus, it is bound to affect crew competency if onboard training could not be carried out effectively.

6.2.2 Technical condition of ships for onboard training is different

Shipping companies have ships with different conditions, some big shipping companies own various categories, good condition and advanced equipment ships, but some companies have only aging ships with old equipments, this will lead to the great discrepancy on training outcome, seafarers sometimes could not combine theory with practice when he or she work in an old ship. The seafarers can not combine with the practice condition of training ship, navigation and cargo shipping in the process of onboard training to digest the navigation knowledge, which makes training issues and training contents in training record book difficult to be completed, it is hard to achieve the purpose of promoting seafarers' competency and capability in practical operation.

6.2.3 The enthusiasm of onboard training for seafarers is not active

Maritime industry is now faced with another difficult problem, that is onboard training is not actively committed by seafarers, the trainee has little interest, thus little effect has been achieved (Li, 2011, p53). Crew depends on careful observation and repeated practice if they are going to familiar with ships' procedure or operational steps, but because of the boring life on board and bad sea condition frequently met, enthusiasm for the ship and crew onboard training initiative is not strong, seafarers would rather pretend to know, while not asking for senior officers' help, which lead to the poor effect of onboard training.

6.3 The quality of on-board training officer is not satisfactory

Some Chinese ships is now lack of formal and responsible onboard training officer,

onboard training officers are normally senior officers on board, but without undergo special training on this job. Onboard training officers qualification and onboard training have not specific requirements now. Because the trainees and trainers work for the same company, the onboard training process is to some extent influenced by personal feelings and relationship among them, which affect the actual result of onboard training (Zhang, 2006, p16).

In addition, the onboard training officer is responsible for his or her daily job, the onboard training work is bound to increase his or her working load, occupy the rest time, the ship management company had no regulations regarding to the rewards and punishment of training work, some officers even the masters are not active for the onboard training work, which result in the trainers could not perform their duties well, formalism is popular in a certain way, fail in supervision and not follow the guidance of onboard training plan, record is incomplete, and sometimes lack of signature, the objective assessment are not available. Consequently, the company and MSA could not know the exact competence of seafarers, which is obviously not conducive to maritime safety.

6.4 Inadequate supervision of the maritime authority over onboard training

The supervision of maritime authority is not performed well, especially for tracking onboard training management. This is mainly because the crew management of MSA is weak, lack of staff to strengthen the on-site supervision, lack of tracking management to onboard training, and the supervision only depends on the regulations set by the company. This can not guarantee that the actual condition of onboard training. MSA also lacks of capability to distinguish the real service experience of seafarer in his service record book. Thus, fake service record appears

from time to time. In addition, the punishment rules have not been clearly set; it has been suggested that trainer should also bear the responsibility to some extent when the trainee gets his or her punishment after the major accident.

6.5 Onboard training mechanism of Maritime Safety Administration is incomplete

China's management rule for the onboard training was enacted in 2000, and it has not been changed since then. With the rapid change of navigation technology, and the old management rule is not suitable for the present onboard training requirements. In addition, the contents of training in the training record book and plans can not match with the development of modern navigation technology, the new training program is not updated, and the old training program is not deleted, which seriously decrease the effectiveness of onboard training. Although there are some new rules in other relevant laws and regulations concerned with onboard training, such as the "seafarer examination and certification regulations" promulgated in 2012, these regulations are mainly concerning with new requirement for service record, not related to specific implementation procedures and program implementation, national standard is thus not unified. In summarize, all of these has a close relationship with lack of laws or regulations for onboard training in China.

6.6 Onboard training management system made by shipping companies is incomplete

Shipping companies should study the provisions of training management regulations and other relevant laws and regulations as well, effectively combined with the actual situation of the company, in order to develop practical onboard training management system, and then enforce it seriously. But in practical situation, as sailing area and way of management in each Shipping company are different, some shipping

companies copy rules and regulations of others or just copy the existing laws or regulations, which obviously could not combine the actual condition of company with the laws and regulations, and so the quality of onboard training plan will not satisfy the seafarers, Such a set of management system would lack of operability and can not work as a guidance (Wang, 2008, p2).

7 Measures to improve onboard training

7.1 Establishing corresponding policy to adjust enrollment of the number of officers

The construction and development of Chinese seafarers' team is still confronted with many limitation factors. According to China's actual conditions, in order to establish a seafarers' team with good quantity and quality, the prerequisite is to comply with the requirements of the international conventions, the domestic law also has to combined with the characteristics of the domestic shipping market, introduce the corresponding seafarers' management policy, control the increasing crew onboard training as soon as possible, shift the satisfaction from number to quality, guarantee the reasonable development of the crew, increase the onboard training opportunity. MSA should set more stringent requirements regarding to the nautical facility and teachers' qualification. An institution is not allowed to recruit students if not up to the standard. Based on a strict standard for the approving of new training agencies from the year 2011, China MSA maintains a strict standard for supervision over the daily management and 60 seafarer training agencies went through verification in 2012(China seafarer annual report 2012).

7.2 strengthen onboard training measures of shipping company or institutions

Shipping companies and relevant institutions are requested to establish and perfect the crew training system according to relevant laws and regulations, enforce the plan of training well, perform well in accordance with the provisions of regulations made by MSA, then fill in the record book according to truth. In order to make the shipping companies or institutions carry out the onboard training effectively, the following measures could be consulted:

The authorities shall implement supervision and management to onboard training, shipping company need to develop detailed onboard training management rules and regulations, improve the understanding of the importance of onboard training. The authority can only approve company to carry out training after valid verification.

The management of onboard training shall be integrated into the company quality management system; responsibilities should be allocated, and the seafarer's technical capability and competence should be effectively improved, in order to ensure the navigation safety of ships.

MSA can randomly inspect and evaluate onboard training plan presented by shipping companies, certain preferential policies can be given if it is well performed, if not in a satisfactory condition, the MSA can suspend or even cancel the qualification of onboard training, shipping companies or crew training institutions, and a deadline is given for rectification.

Companies are expected to establish evaluation mechanism, make quantitative evaluation to onboard training, carefully analysis deficiencies and problems of onboard training, to explore and implement training process through the quantitative management, improve onboard training effect;

Maritime authorities can also convene local shipping companies to have an onboard training meetings regularly, in order to exchange experience, summarize good experience and to rectify deficiencies, share good experience thus promote onboard training level together.

7.3 strengthening the on-site supervision and tracking for onboard training

The authority should take corresponding measures, through the on site supervision, to implement tracking and management. If deception or forged qualifications were found, punishment should follow according to the relevant laws or regulations. At the same time connect company credit rating with onboard training; connect honest captain or honest ship with onboard training. Only in this way, the authority can effectively improve the ship training management quality and promote the responsibility of trainers and trainees.

MSA may implement dynamic management to onboard training, complete training management database on the ship, construct training management accountability system on board, that is, to implement tracking management to crew that had complete training, If the trainee is found unqualified or take the major responsibility of big accidents, not only he should be punished, his trainer also has to be blamed.

7.4 Complete relevant laws and regulations for onboard training

Maritime authorities should enact laws, regulations and guidance documents in time according to international conventions and training plan for maritime elites, develop documents of training content and standard of onboard training, procedure of implementation, company trainer and on board trainer qualification and standard, assessment scheme and method of implementation. In order to guarantee the real implementation of onboard training, promote the competence and comprehensive capability of crew. A set of new “onboard training book” and “onboard internship book” should be drawn up to unify national standards and content of onboard training, thus effectively improve the crew practice level and professional capability.

7.5 Regulate the qualification of company training officer and shipboard training officer

The qualification of trainer is the key factors affecting the quality of crew training. In order to ensure the quality of onboard training, corresponding qualification is required for the company trainer and the on board trainer. First of all, it is merrier that company trainers and on board trainers are all on management level , otherwise it is difficult to reach the training level if the trainer does not have any the corresponding sea experience, and management and technical capability. Secondly, company and on board trainers should undergo special training recognized by maritime authority. The trainer should have at least the following qualities: owns necessary knowledge and skills with a solid theoretical foundation, good professional quality, strong language expression capability, familiar with or even proficient in the relevant international conventions, rules, regulations, and know knowledge regarding maritime safety and pollution prevention well.

Shipping companies should formulate relevant management system of company trainers and on board trainers, to ensure the company trainers to play a role in all aspects of onboard training, help the on board trainer to carry out onboard training smoothly. The maritime administrations should also strengthen the assessment on the qualification of company trainers, take appropriate ways of training, to ensure that the on board trainer has the complete capability to train and assess trainee's competency according to IMO conventions. Take Philippines for an example, in order to ensure the quality of onboard training, CHED (Commission on Higher Education) require all senior officers in the training institutions to be responsible for the onboard training to ensure trainee's successful training on board. This senior officer in charge of training shall at least have more than one year's sea experience,

and hold officer's certificate. He will monitor the trainee's on board performance, write down and update their graduation record. Trainee competence will be recorded in the "International Shipping Federation training record book", this book has been adopted as formal training record book of Philippines (Rao, 2000, p67) .

7.6 Make full use of the CBT (Computer Based Training) to promote onboard training

CBT combined with the text, voice, video clips, animations, graphics, images and other elements, pictures, sounds and images is intuitive and vivid which cause and improve the interest in learning, and it can enhance the ship training impression as well. CBT has been applied to some of the world's biggest shipping companies for crew training as it can integrate the requirements of IMO conventions with the operation of ship equipment, and it can set any level of training program through training trainers. All the training part can be separately set in accordance with the lowest frequency and the lowest score; furthermore, it can be used any time for on board trainers. The training records can monitor all of your training activity, and comprehensive evaluation are given based on the crew training results, thus to determine whether trainee's reached the criteria of competence. If onboard training is combined with application of CBT, it can improve the way of single ship training, and can have re- training. It can save resources on board and diminish operation risk of equipment, and help to facilitate trainee's self training; it also can help decision makers to assess trainee's general condition of competence, which can be concluded as an effective way of onboard training.

8 Conclusions

In the face of the international financial crisis recovery step by step, the crew number change because of the shipping industry and the international crew labor market demand, the amendment of international convention, and the development policy reform of the Chinese crew and the adjustment of crew structure, all of above mentioned, for the Chinese crew members, are opportunities and challenges.

At present, there are greatly improved for inland and foreign trade transport, the primary means of the carriage of goods by sea is shipping, and so the shipping company will also have the very big development space. This means that it shall need a lot of high-quality ocean-going seafarers, and the international labor market also need a lot of the crew (Zhang, 2010, p162).

Our crew structure is complex, personnel are numerous, if the comprehensive ability of our crew wants to meet the development of international shipping, in view of the situation of the crew competency training, in addition to gradually improve the Marine technology theory, we need to pay more attention to and improve the crew onboard training and the final implementation effectiveness. Regardless of the national policy, the management mechanism of company and ship, or the standards of ship training officer, the implementation of onboard training and the record of training record book, all of above can not meet the training requirement of the high quality crew in our country at present. So the problem of seafarers' onboard training need to solve urgently in our country, we should formulate the policy and specific measures of seafarers' onboard training to meet the standards of the international convention and conform to our national conditions, standardize the training system of the company and ship, strengthen the implementation and

execution of the on-board training, by this way, it can thoroughly improve the crew's actual operation level, promote the quality of crew, ensure the safety of shipping, promote the development of shipping industry in our country, and accelerate the development process from a large number crew country to a strongest crew country.

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