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WORLD MARITIME UNIVERSITY
Malmö, Sweden

THE IMPACT OF THE REVISED STCW CONVENTION ON CHINESE HIGHER MARITIME EDUCATION AND TRAINING INSTITUTIONS

By
YE GUANGHUANG
People's Republic of China

A dissertation submitted to the World Maritime University in partial fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE

in

GENERAL MARITIME ADMINISTRATION & ENVIRONMENT PROTECTION

1996

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Declaration

I certify that all the material in this dissertation 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 dissertation reflect my own personal views, and are not necessarily endorsed by the University.

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Abstract

The International Convention on Standards of Training, Certification and Watchkeeping (STCW) is regarded as the most important instrument ever established by the International Maritime Organization (IMO) since it deals with the human element to which more than 80% maritime casualties are attributable. This dissertation examines the main reasons for revising STCW'78 and the major features of the revised Convention. This revised Convention overcomes the deficiencies of the existing Convention. It is believed that it will bring about a greater impact on maritime administrations, shipping companies and maritime education and training (MET) institutions in particular.

It is universally recognized that MET institutions play the most important role in providing qualified seafarers. In order to identify the existing problems and weaknesses in the Chinese MET system, an analysis is made. This analysis covers Chinese national legislation regarding MET, the roles and background of higher MET institutions, and the country's advanced MET system including the main scheme, the status of instructors and teaching methods, examination and assessment practices.

A comparison is also made between the requirements of the revised Convention and the present situation in Chinese higher MET regarding policies, curricula, instructors, teaching methods, quality evaluations, etc.

Based on the situation analysis, the comparison with the revised Convention and the identification of problem areas in Chinese higher MET, proposals and recommendations are made for the effective implementation of the revised STCW Convention.
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LIST OF ABREVIATIONS

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AMTA  Arab Maritime Transport Academy
ARPA  Automatic Radar Plotting Aids
CAL  Computer Aided Learning
COSCO  China Ocean Shipping (Group) Company
COW  Crude Oil Washing
DMU  Dalian Maritime University
GANC  Guangzhou Advanced Navigation College
GMDSS  Global Maritime Distress and Safety System
GOC  General Operator Certificate
ICFTU  International Confederation of Free Trade Unions
IFSMA  International Federation of Shipmasters’ Associations
IMO  International Maritime Organization
ISF  International Shipping Federation
JNI  Jimei Navigation Institute
MARPOL  International Convention for the Prevention of Pollution from Ships
MET  Maritime Education and Training
MSA  Maritime Safety Administration
MSC  Maritime Safety Committee
QOCMC  Qingdao Ocean Shipping Mariners College
SMTWU  Shanghai Maritime Transport Workers University
SMU  Shanghai Maritime Universtiy
SOLAS  International Convention for the Safety of Life at Sea
STCW  International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
STCW Code  Seafarer’s Training, Certification and Watchkeeping Code
STW  Sub-Committee on Standards of Training and Watchkeeping
UK  United Kingdom
UNDP  United Nations Development Program
<table>
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Chapter 1

Introduction

1.1. Background to the Study

The creation of the World Maritime Organization (IMO) in 1959 coincided with a period of tremendous change in world shipping and the Organization was kept busy from the start developing new conventions and ensuring that instruments kept pace with changes in shipping technology. Since then, IMO has endeavored not only to improve the safety of ships and their equipment but also to raise the standards of the seafarers who man them. By January 1996 IMO had been responsible for 35 international conventions and agreements and had adopted numerous protocols and amendments.

Among these instruments the most important ones are the International Convention for the Safety of Life at Sea (SOLAS), 1960 and 1974, the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended in 1995, and the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). It can be argued that SOLAS deals with the ships or the hardware of maritime trade, STCW is concerned with the seafarers or the software, and MARPOL refers to the sea or the environment where seafarers navigate the ships.
It is known commonly that the maritime industry has undergone accelerated advancements in maritime technology. The level of today's ship technology can be considered adequate to deal with various complicated natural conditions. However, the quality of shipping personnel is far from being satisfactory. Over the years the popular contention among maritime professionals has already converged on the human factor as the main cause of maritime casualties. It is a well known fact that more than eighty percent of maritime casualties are caused by human error.

The only way to eliminate or reduce the risk of human error in shipping casualties is to develop the skill and competence of seafarers through effective education and training. It is for this purpose that the STCW Convention was written prescribing the minimum standards for the training of seafarers. Unfortunately, the existing Convention leaves standards to the interpretation of the administration. As a result standards and procedures vary widely, even though shipping is the most international of all industries. Realizing the deficiencies in the existing Convention, IMO strongly felt the necessity of revising it and, at last, in July 1995, the revised Convention was successfully adopted.

The amendments of the Convention are so substantial that it has, to a large extent, been rewritten. The new requirements of the revised Convention have a great impact on administrations, maritime education and training (MET) institutions and shipping companies. No Parties are allowed to behave at their own discretion with regard to training standards.

The changes are so extensive and the impact is so great that it is essential to examine the present situation of MET in each member State. Chinese MET, especially higher level MET, is today facing a great challenge brought about by the revised Convention. How to meet the challenge of the new requirements is a significant topic for study.

1.2. Importance of the Study
Training, certification/examination and watchkeeping are three inseparable links. However training is the most important of them, because certification/examination is only a means to evaluate the outcome of training, and safe watchkeeping is dependent upon satisfactory training. Modern equipment is indispensable for safer shipping and cleaner oceans but human beings are the decisive factor. High quality shipping personnel are turned out through education and training. The STCW Convention deals particularly with this important aspect: the training of seafarers. Training helps to implement a quality approach, promotes a general attitude to seek quality performance and facilitates employees improving their expertise and providing quality services. It is essential to note that whenever mistakes are made in shipping, the potential costs are fourfold. The first is the cost of rectifying the mistakes, the second is the loss to company image and reputation, the third may be the cost of human life and finally there may be a claim for compensation.

Through education and training the risk of human error may be reduced if not totally eliminated, because training is a planned and systematic effort to modify or develop knowledge, skills and attitude through experience to achieve effective performance in an activity or range of activities. The purpose of MET is to enable a seafarer to acquire skill and competence in order to perform efficiently a given task or duty.

This paper is therefore oriented to evaluate the new requirements of the revised STCW Convention and to analyze the present situation of Chinese MET. In order to rectify problems it is necessary to identify them first. Therefore the author makes a comparison between the new requirements of the revised Convention and the present status of MET in China, and as a consequence, identify the problems in order to draw them to the attention of the administration and particularly the higher MET institutions. If the attempt is successful the organizations and people involved in MET will better understand certain problems, in order to consider taking the
measures proposed by the author to initiate positive action to remedy them and so to fully and completely implement the revised STCW Convention.

1.3. Methodology and Scope of the Study

This study consists of a short survey of specialized literature on the STCW Convention, which includes the existing Convention, the revised Convention, the relevant reports by the Sub-Committee on Standards of Training and Watchkeeping (STW), guides to the revised Convention and other various books and articles on the preparation for the implementation of the revised Convention. Sources of materials comprise the reference materials available at the World Maritime University (WMU) Library, materials available from the author’s home country, study materials from and lectures by resident and visiting professors of WMU and related seminars. In addition the author has consulted with and interviewed a number of Chinese major MET institution leaders, Chinese Maritime Administration, some shipping company managers and master mariners. The consultations and interviews were very useful for the formation of some of the author’s ideas.

The above survey forms the basis for a description of the revised STCW Convention, an analysis of the present situation of Chinese MET, a comparison between the requirements of the Convention and Chinese MET and proposals for the Chinese Maritime Administration and the MET institutions.

This dissertation contains six chapters. Chapter one gives a short introduction to the background, the importance of the study and the methodology and scope of the study.

Chapter two makes a general review of the revised STCW Convention, including a brief overview of its revision work, its main features, structure, format, contents and its impact on MET institutions in general.
Chapter three analyses the present situation of Chinese higher MET. The analysis covers the national legislation, roles of Chinese MET institutions and their brief background, the advanced MET system in China and the quality of the graduates.

Chapter four makes a comparison between the revised STCW Convention and current Chinese MET. The comparison investigates the areas of speciality divisions, curriculum lay-out, contents of courses, practical teaching and training, special training and basic safety training, instructors and assessors and their methods, English language ability, training equipment and facilities, quality standards system, and financial problems.

Chapter five discusses the indications of the revised Convention for Chinese MET. Proposals are made regarding the areas examined in the preceding chapter.

Chapter six concludes the study by summarizing the key issues facing the Chinese Maritime Administration and especially the MET institutions and finally suggests actions for them to take in order to fully and effectively implement the revised STCW Convention.
Chapter 2

A General Survey of the Revised STCW Convention

2.1. Brief Overview of the Revision Work

2.1.1. Background to the Revision

The 1978 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers enjoyed broad global acceptance. By July 1 1995, the Convention had been accepted or ratified by 113 countries thereby covering 94.6% of the world total shipping tonnage. However complaints about this Convention were frequently heard over the years from its entry into force. It was realized that the Convention had not achieved its purpose. It had actually lost its credibility.

The main causes leading to its revision may be summarized as follows:

a. The Convention lacks precision in its standards of competence relating to the abilities needed to perform shipboard functions safely and effectively. In fact it only stipulates the minimum knowledge requirements for the issue of certificates. The interpretation of precision in its standards is left 'to the satisfaction of the Administration'. This has resulted in different interpretations and many Parties to the Convention have failed to effectively administer and enforce the requirements.
b. Neither the process of ratification nor the provisions of the Convention have been sufficient guarantees to ensure that STCW requirements have been implemented worldwide or sufficiently enforced. Consequently STCW certificates could no longer be relied upon as evidence of competence.

c. The 1978 Convention lacks the flexibility to meet the industry's anticipated needs in the next century. It is based on traditional divisions between the deck and engine departments. Therefore it has failed to accommodate modern developments in training and shipboard organization. This has appeared to be too restrictive, limiting the potential career development of seafarers and preventing any safety-enhancing redistribution of workload on board during intensive working periods.

d. Other factors have also reduced the effectiveness of the existing Convention, such as the reliance placed on the acquisition of shipboard skills and competence to a great extent through service at sea. Unfortunately the quality of the latter varies a great deal depending on the interest of the senior officers and the training policy of the company. As a matter of fact, in more recent years the factors of crew reduction, faster turn-round, more frequent crew change, the mix of differing education and training backgrounds resulting from multinational manning have undermined the effectiveness of this shipboard training.

The above factors became a significant force in the demand for change.

2.1.2. Review of the Revised Convention

The IMO International Conference on Standards of Training, Certification and Watchkeeping met in London from June 26 to July 7 1995. The Conference was attended by representatives from more than 70 Parties to the 1978 Convention. The
adoption of substantial amendments to the Convention is the most important development concerning the improvement of maritime safety for over a decade.

As a matter of fact, since its entry into force, the STCW Convention has been amended twice apart from the big revision of 1995, the first two amendments in 1991 in respect of its radio communication provisions and in respect of its special requirements for personnel serving on tankers. The preliminary work of 1995's revision can be traced back to as early as 1992. In February 1992 the STCW Sub-Committee agreed in general with a proposal by the International Shipping Federation (ISF) that a detailed examination and assessment should be made of current and future trends in maritime training and the methods of improving knowledge both ashore and afloat, such as the use of simulators. Following that, a number of measures were put in place. IMO member governments were requested to provide information on the current availability and use of simulators in maritime training. The problems of fatigue among seafarers, manning levels, drug and alcohol abuse etc. were also under consideration. In December 1992 the Maritime Safety Committee (MSC) agreed with a proposal of the United States to change the work program proposed by the Sub-Committee on the STCW Convention and instructed it to commence a comprehensive review of the Convention and to consolidate proposed amendments by 1996. The Sub-Committee was then further instructed to prepare a comprehensive list of items to be reviewed and additions to be made and to submit this for approval.

Following a series of high profile maritime casualties, in early 1993, in reviewing the status of IMO initiatives and noting the concern being expressed by maritime countries about general levels of crew competence, Mr. O'Neil the Secretary-General of IMO stressed that the effort to amend the STCW Convention should be conducted with a view to bringing the amendments into force at the earliest possible time. On the suggestion of Mr. O'Neil, the comprehensive review was accelerated by using a
small number of consultants to prepare a revised text under the direction of the Sub-Committee on STCW.

The consultants were composed of experts from Germany, Korea, Mexico, the Netherlands, Spain, the United Kingdom, the United States, the International Confederation of Free Trade Unions (ICFTU), International Federation of Shipmasters' Associations (IFSMA), the ISF, the Arab Maritime Transport Academy (AMTA), Dalian Maritime University (DMU), the National Maritime Academy of Singapore, Singapore Polytechnic, and the WMU.

The use of consultants proved to be successful in providing the quality of input necessary to allow IMO to circulate basic texts for the 1995 Conference that were complete, well prepared and reasonably acceptable on a global basis. As Morrison (1995: 2) puts it:

The use of consultants and Inter-Sessional Working Group of the STCW Sub-Committee allowed basic texts to be approved by IMO and circulated for the 1995 Diplomatic Conference within a two year period. The easy acceptance of the basic texts by the Conference reflected the quality of their preparatory work.

2.1.3. Aims of the Revision

The main aims of the revision were:
a. to transfer all detailed technical requirements to an associated Code;
b. to clarify the skills and competence required;
c. to require administrations to maintain direct control over and endorse the qualifications of those masters, officers and radio personnel whom they authorize to serve on their ships;
d. to make parties to the Convention accountable to each other, through IMO, for their proper implementation of the Convention and the quality of their training and certification activities;
e. to have the amendments enter into force for all parties to the Convention with the least possible delay.

2.2. Main Features of the Revised Convention

The main features of the revised Convention cover eight essential areas.

2.2.1. New Responsibilities for Shipping Companies

Shipping companies will be held responsible for the assignment of seafarers for service on their ships and will be required to ensure that the seafarers they employ meet minimum international standards of competence; that ships are manned in accordance with flag state requirements and that detailed records of all seafarers are maintained to be readily accessible.

Companies will also be required to ensure that all seafarers, on being assigned to their ships, undergo familiarization with their specific duties and with all ship arrangements; and that measures are adopted to ensure effective coordination between seafarers in emergencies, and that watchkeepers must be adequately rested and fit for their duties.

The provisions will be enforced by requiring governments to apply penalties or disciplinary measures to companies found to be in breach of the revised Convention and by expanding the circumstances in which port state control inspectors can question the operational competence of seafarers.

2.2.2. New Uniform Standards of Competence
The revised Convention establishes uniform standards for the attainment of competence in particular maritime skills. It contains specific requirements detailing the standards of knowledge, understanding and proficiency to be achieved in each element of competence by candidates for certification, the methods for demonstrating competence and the criteria for evaluating them. For example, the competence of being able to ‘plan and conduct a voyage and determine position’ comprises tasks and skills using: celestial navigation, terrestrial and coastal navigation, electronic position fixing systems, echo sounders, compasses, steering control systems and meteorological information.

2.2.3. New Approach Adopted for Development of Standards of Competence

The revised Convention also extends elementary standards of competence to categories of shipboard personnel not addressed in the 1978 Convention. ‘Competences’ for all of the tasks, duties and responsibilities that need to be performed on board have been grouped together to form self-contained shipboard ‘functions’. ‘Functions’ identify more distinct groups of skills, abilities and responsibilities than those established by conventional departmental divisions which form the basis of standards in the 1978 Convention. In total the revised Convention defines standards of competence for seven functions:

- Navigation
- Cargo handling and stowage
- Controlling the operation of the ship and care for persons on board
- Marine engineering
- Electrical, electronic and control engineering
- Maintenance and repair
- Radiocommunications
The standards of competence needed to be achieved for each of these functions are defined at up to three levels of responsibility, namely: 'Management level', 'Operational level' and 'Support level'. The management level corresponds to senior officers, the operational level to junior officers and the support level to ratings.

For instance, the function of 'Marine engineering at the management level' comprises the competences necessary to 'plan and schedule operations; start up and shut down main propulsion and auxiliary machinery including associated systems; operate, monitor and evaluate engine performance and capacity; maintain safety of engine equipment, systems and services; manage fuel and ballast operations; use internal communication systems' (Table A-III/2, STCW Code).

2.2.4. New Requirements for MET Institutions

The revised Convention contains some very significant provisions which include the mandatory use of simulators in radar and automatic radar plotting aids (ARPA) training, the qualification of training instructors and assessors, the evaluation of the training quality by outsiders.

2.2.5. New Provisions Regarding Quality Standards

Under new provisions in the revised Convention, each Party must ensure that from February 1 1997 onwards all training, assessment of competence, certification, endorsement and revalidation activities are continuously monitored through a quality standards system. Also, all aspects of their national training and certification systems are to be evaluated independently at least every five years, and a full report of this evaluation is to be submitted to IMO. Information on all independent evaluations completed after February 1 1997 must be communicated to IMO within six months of their completion.
2.2.6. New Reporting Requirements for Governments

Apart from Article IV, the revised Convention contains further requirements for the governments regarding information communication. Each Party to the Convention must provide detailed information before August 1, 1998 to IMO concerning administrative measures taken to ensure compliance with the revised Convention, education and training courses, certification procedures and other factors relevant to implementation. This information will be examined and used, prior to the publication by IMO of a list of governments that are able to demonstrate that they can give full and complete effect to the Convention.


Taking account of the difficulty for all Parties to apply all the revised requirements on February 1, 1997, the revised Convention specifies some transitional provisions. However the provisions refer only to existing certificates. New entrants commencing training after August 1, 1998 will be required to do so according to the newly adopted standards. Governments will have to submit documentary evidence to IMO of compliance with the revised requirements. All other transitional measures will end by February 1, 2002. In addition, an early start should be made towards replacing the tonnage limits which appear in prior master and deck officer certificates and endorsement so that the process may be completed by 2002.

2.2.8. New Measures to Ensure Implementation by Governments

This revised Convention incorporates measures designed to help ensure that member governments to the Convention actually implement STCW requirements and that certificates are only issued to those who really meet the minimum competency standards. The Convention also clarifies the responsibilities of flag states regarding
the competence of seafarers serving on their ships, whatever country has issued the certificates.

These major components form part of the total revised STCW text intended to ensure that the principal factors determining standards of training and crew competence will be sufficiently regulated internationally.

2.3. Structure, Format and Contents of the Revised Convention

Generally speaking, the changes in the Convention are so far reaching that it seems to have been re-written: two new chapters have been added and technical regulations transferred and expanded into a new code. However, there are no changes in the articles so as to allow the amendments to be adopted and enter into force by means of the 'tacit acceptance procedure'.

2.3.1. The Structure

The new version is made up of Articles which remain unchanged and an Annex which contains 8 Chapters incorporating Regulations dealing with general provisions. A new Code contains detailed technical provisions stipulating the minimum knowledge requirements for particular disciplines.

The revised STCW Convention comprises the following three parts:

a. **The articles**, which remain unchanged for legal reasons.

b. **An Annex of Regulations**, which are contained within 8 Chapters covering basic legal requirements. Two of these 8 Chapters are totally new, the others having been substantially amended.
c. A new ‘Seafarer’s Training, Certification and Watchkeeping Code (STCW code)’, which also has 8 Chapters. This replaces the original appendices and contains further details and interpretation of the Articles and Regulations.

The STCW Code is further divided into two parts. ‘Part A’ contains mandatory requirements. All parties to the Convention will have to implement them. Its sections are arranged in the same order and have exactly the same force as the regulations in the Annex. ‘Part B’ contains recommendatory guidance. Its purpose is to achieve the uniform application of all STCW provisions. Its sections are arranged in the same order as Part A, with the exception of its Chapter V.

2.3.2. The Format

The format of the new version is more logical and has a numbering sequence which allows the reader to follow provisions contained in the regulations through to the relevant sections of the STCW Code.

For example, the minimum requirements for officers to keep a navigational watch are contained in Chapter II:

- Regulation II/1, paragraph 2.5, stipulates that every candidate ‘shall have completed approved education and training and meet the standard of competence specified in Section A-II/1 of the STCW Code’.
- Section A-II/1 of the STCW Code contains detailed mandatory standards of competence and on-board training for navigational watchkeepers.
It can be seen that the Regulations set out the general requirements for which Part A of the Code contains mandatory elaboration and Part B of the Code provides recommendatory guidance and advice.

2.3.3. The Contents

As mentioned above, the Articles remain unaltered. The 1995 amendments replace the entire Annex to the Convention. The amended Annex is organized in 8 Chapters (See below), with technical detail contained within the above mentioned Code.

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Chapter I has been strengthened to better ensure proper implementation, monitoring and enforcement of the Convention. The main contents of each regulation in Chapter I are summarized in Appendix 1. The contents of Chapters II to VIII are briefly explained in Appendix 2.

2.4. Impact on MET Institutions

It is felt that the revised Convention will have a great impact on MET institutions. All requirements of the Convention that directly affect the activities of MET institutions
take immediate effect on February 1, 1997 with some exceptions until February 1, 2002. To enable the seafarers to live up to the uniform standards of competence, MET institutions must undertake a weighty task. The instructors and assessors, the teaching and assessing methods, the training equipment and facilities, the existing courses and training materials etc. are confronted with a new challenge. Generally the impact brought about by the revised Convention on maritime institutions may be summarized as follows:

2.4.1. Instructors and Assessors to Be Qualified and Experienced

The relevant provisions and requirements in Regulation I/6 and Section A-I/6 of the Code stipulate that instructors and assessors must be appropriately qualified for the particular types and levels of training and assessment of competence. Qualifications include necessary experience to be specified. For example, if conducting training using a simulator, the instructor needs to have gained practical operational experience on the particular type of simulator being used. Similarly, in conducting assessment involving the use of simulator, the assessor needs to have obtained practical assessment experience on the particular type of simulator under the supervision and to the satisfaction of an experienced assessor.

2.4.2. Competency Based Training and Assessment to Be Emphasized

One of the most significant features of the revised Convention is that it establishes precise standards of competence relating to the actual ability of seafarers to perform their tasks safely and effectively. This represents a major advance upon the 1978 Convention, which only stipulates knowledge requirements, leaving standards of competence largely to be determined by the respective governments.
Competency based training and assessment will inevitably bring about a revolution in MET institutions. It is universally recognized that STCW standards should form the core curricula of all MET institutions and constitute the basis for evaluating and approving training provisions for trainees. Required under the revised Convention, the traditional knowledge based teaching method and assessment method relying mainly on written examinations should be improved.

'All existing courses and training materials must also be revised to ensure that training outcomes are linked to the competence specified under the Convention and require the current and intelligent application of all associated knowledge, proficiency and skills' (Morrison, 1995: 51).

2.4.3. Quality Standards to Be Ensured

Quality assurance is the key to the best outcome at all levels in teaching, training, examination and assessment activities. As in all economic activities, quality assurance is becoming more and more significant in the training of seafarers. Therefore it should be taken seriously by MET institutions. The revised Convention has taken this into account and set out in Regulation I/8 and Section A-I/8 of the Code some requirements regarding the quality standards to be applied to all training and assessment activities by the parties. Under the new Regulation, MET institutions are obliged to ensure that all training and assessment activities are continuously monitored for their quality and that periodical external evaluation is made by appropriately qualified persons who are not involved in the activities to be evaluated. The administration must be provided with the results of each evaluation so that they may be incorporated in the information to be reported to IMO. This is an arduous task. Its purpose is to turn out qualified seafarers. In case the seafarers turned out are not appropriately qualified, which prevents the Party from appearing on the 'White List', the MET institutions concerned will be the first to be blamed.
2.4.4. Increased Requirements for Revalidation to Be Met

To ensure 'safer shipping and cleaner oceans', the revised Convention has put forward new requirements concerning the existing certificates. Required under Regulation I/11, member governments shall revalidate STCW certificates and compare the qualifications of existing certificate holders with those issued certificates under the revised Convention. To revalidate STCW certificates, again, MET institutions are assigned new tasks. Relevant refresher courses shall be offered and updating training or assessment shall be carried out. In order to provide approved refresher and updating courses, MET institutions have to keep up with the development of the industry and the recent changes in national and international regulations.

2.4.5. Use of Simulators to Be Mandatory

Although simulation is no substitute for real hands-on experience on ships, its significance in training and assessment is unquestionable because it can provide an alternative medium with which to acquire many of the necessary skills in a risk-free environment. Under the new requirements, radar and ARPA training, including related competence assessment and demonstration by simulators shall be made mandatory. This is one of the most important components in all the training programs in MET institutions. Section A-I/12 of the Code stipulates the standards governing the use of simulators, the training objectives, training procedures and assessment procedures. Apart from radar and ARPA simulators, the use of simulators in other areas is recommended and encouraged, such as navigation and watchkeeping, shiphandling and manoeuvring, cargo handling and stowage, radiocommunications, and main and auxiliary machinery operation. It is apparent that to enable simulators to be installed and put into use, large capital investment is needed. However money is always a big problem faced by most MET institutions.
2.4.6. Minimum Safety Training for All Seafarers to Be Compulsory

The importance of safety in shipping can never be over-emphasized. Safety at sea concerns not only human lives, the ship and the cargo, but also the marine environment. Although most safety work rests to a large extent with the master and officers, ratings such as members of the catering department who are concerned about their roles in emergency response situations also need relevant safety training. Therefore Regulation VI/1 specifies some basic safety training for all seafarers. The approved basic training or instruction includes personal survival techniques, fire prevention and fire-fighting, elementary first aid and personal safety and social responsibilities. In addition, seafarers who are designated to control fire-fighting operations or to provide medical first aid or to take charge of medical care need to meet the standards of competence. Although there are some IMO model courses to assist in the preparation of the courses, MET institutions still have a great deal of hard work to do as regards training materials and training of trainers.

2.4.7. Curricula for Functional Approach to Be Re-structured and Re-developed

The functional approach is known as alternative certification and is also referred to as the 'competency based or skill based approach'. "Function" means a group of tasks, duties and responsibilities, as specified in the STCW Code, necessary for ship operation, safety of life at sea or protection of the marine environment" (STCW Regulation I/1, paragraph 22).

In Regulation I/1 of the revised Convention, 'appropriate certification' is defined as a certificate of the functions involved at the level of responsibility specified. In addition, under the requirements of Section A-I/2 of the Code all the certificates of competence should indicate that the lawful holder 'has been found duly qualified...', and has been
found competent to perform the following functions, at the levels specified’. A new
form of certificate which provides some blanks to fill in ‘functions’ and ‘levels’ is
included in the Code (See Appendix 3). In all the Tables of the specification of
minimum standard of competence for various seafarers the specific contents of
standard of competence are also arranged based on the ‘functions’ and ‘levels of
responsibility’. Therefore it may be said that not only does the revised Convention
introduce the functional approach itself, but also the conventional certification bears
the ‘functional’ principle and its train of thought.

Although alternative certification is not going to be introduced by some parties in the
near future, there is merit in taking the opportunity to re-adjust the curricula so that
courses are aligned with the functions identified in Chapters II, III and IV. However
alternative certification is a new trend and it has many advantages. It is expected to
be adopted by the Parties in the 21st century. Even if the ‘alternative certification’ is
not going to be adopted by the administration in the near future, the MET institutions
should try to gain the initiative for an early transition from conventional certification
to alternative certification. Of course for the MET institutions to re-structure and re-
develop the curricula at an early time based on the ‘functional’ concept which focuses
on competence, is not an easy job to do.

When an administration adopts the alternative certification, its MET institutions will
have another task which is to offer courses corresponding to the ‘functions’ to the
existing seafarers who intend to develop their career and acquire more ‘functions’
through further shore-based training, correspondence courses or distant learning
courses for alternative certification. As stipulated in Regulation VII/1, candidates for
alternative certification shall have completed approved education and training and
meet the requirements for standards of competence. In this respect the MET
institutions are duty-bound to meet such requirements.
Chapter 3

An Analysis of the Present Situation of
Chinese Higher Maritime Education and Training

3.1. National Legislation Regarding MET

In 1978 the Chinese government sent a delegation to attend the Diplomatic
Conference on the Standards of Training, Certification and Watchkeeping held in
London from June 14 to July 7 and approved the STCW Convention on June 8, 1981.

The STCW Convention 1978 stipulates in Article I that 'the Parties undertake to
promulgate all laws, decrees, orders and regulations and to take all other steps which
may be necessary to give the Convention full and complete effect, so as to ensure that,
from the point of view of safety of life and property at sea and the protection of the
marine environment, seafarers on board ships are qualified and fit for their duties'.
Article VI of the Convention further sets out that 'Certificates for masters, officers or
ratings shall be issued to those candidates who, to the satisfaction of the
Administration, meet the requirements for service, age, medical fitness, training,
qualification and examinations in accordance with the appropriate provisions of the
Annex to the Convention'.

Being a party to the international STCW Convention 1978, the Chinese government
needed to consider formulating its legislation regarding MET in conflict with the
Convention. Therefore its old legislation had to be either amended or discarded. Meanwhile a series of new policies, rules and regulations had to be made and promulgated in compliance with the Convention. However, to examine China’s legislative work in this respect, a look at the whole picture both before and after the 1978 Convention entered into force would be more helpful.

Chinese MET came into existence at the end of the last century when two maritime academies were set up, one in Shanghai and the other in Fuzhou. Nevertheless the training of seamen in the early stages was for the sole purpose of the national navy. It was not until the 1920s that China began to train its own merchant seamen. But in the old days there was no legislation to abide by. The maritime academies were run at a secondary professional level. The schooling, the syllabi and most of the text-books were based on the British system.

Soon after the founding of new China in 1949, the government started to consider educating and training its own seafarers at the higher education level. In 1953 the first higher maritime institution, Dalian Maritime College, was founded. Since then national legislative work on maritime education and training has been progressing. The development can be divided into five stages:

**Stage I: From 1949 (the year of the founding of the P. R. China) to 1965.** During these years the government (the Ministry of Communications) issued two documents concerning the training of seafarers. Although these two documents mainly promulgated the provisions governing examination and certification, they also prescribed the necessary training. The first document, the Temporary Provisions on Examination and Certification for Seafarers on Board Vessels at Sea, was issued in 1953. This can be regarded as the preliminary legislative work on the training, examination and certification of Chinese seafarers. In 1964 the Ministry issued the Regulations on Examination for Seafarers on Board Ships of the People’s Republic of
China. This document was based on the practice and experience of the past years and was thought to be a more progressive one. Unfortunately it remained in force only for two years and then was suspended due to the Cultural Revolution.

**Stage II: From 1965 to 1976.** These were the turbulent years of the Cultural Revolution in China during which rebellions prevailed everywhere. National legislation in every field was suspended. The whole nation suddenly became lawless. After half a decade's turmoil the government saw the necessity of enhancing safety work in shipping industry. Therefore at the beginning of the 1970s, the government issued the Circular of Strengthening Safety Work and the Provisional Regulations on Examination and Certification for Seafarers. Unfortunately the regulations were not put into effect very well.

**Stage III: From 1977 to 1987.** These years were the so-called 'Recovery Period'. The legislative work achieved remarkable effects. This was mainly expedited by the STCW Convention 1978. Under the requirements of this Convention and according to the domestic situation at that time, the Ministry of Communications, based on the Regulations on Examination for Seafarers on Board Ships of the P. R. China, 1964, promulgated in 1979 the Rules on Examination and Certification for Seafarers of the P. R. China and the detailed examination syllabi for deck officers and engineer officers. In 1981 the Maritime Safety Administration (MSA) of the Ministry of Communications issued the Regulations Governing Examination and Certification for Graduates from Maritime Colleges. In 1983 the government issued the Maritime Traffic Safety Law of the P. R. China, in which there are some provisions regarding the training of seafarers. Since then a number of new rules and amendments to the former instruments have been made. They were developed in principle based on STCW 1978, which would be in force in China from April 28 1984. These latter instruments include the Regulations Governing Special Training and Certification for Seafarers, 1984, the New Rules on Examination and Certification of Seafarers of the
P. R. China, 1987, etc. All the new documents were drawn up under the requirements of STCW 1978 and were absolutely in line with it.

Stage IV: From 1988 till 1994. During this period the national fleet was rapidly developing. At the same time seafarers were supplied to foreign countries at an increasing rate. These two factors required the maritime institutions to train seafarers at a higher speed and in greater number. In order to standardize the training, examination and certification and to make clear the duties of each institution, the Ministry of Communications evaluated the MET institutions and promulgated the list of approved institutions which were found to be appropriately qualified to train seafarers under the requirements of the New Rules on Examination and Certification of Seafarers of the P. R. China, 1987. Subsequently some other instruments were also promulgated, such as those concerning detailed specifications for implementation of the New Rules, the management of seafarers' files (1988) for keeping record of various training programs, the safe manning of ships of the P. R. China (1990), etc. The issuing of these instruments improved the national maritime legislation and overcome a lot of problems which had been encountered in the past.

Stage V: From 1995 till now. Due to the recognized deficiencies of STCW 1978, the revision of this Convention had been discussed since 1992. Being one of the first countries to ratify the Convention and one of the Class A member states of the IMO Council, China had been trying to keep its national legislation completely in line with the requirements of the international conventions. In June 1995, China attended the Diplomatic Conference on STCW in London. As soon as the representatives returned from IMO, the Ministry of Communications set to work accordingly. Meetings were held and the preparatory work was divided among six working groups according to document 137/1995 of the MSA. They were the Legislation Group, the Training Group, the Quality Control Group, the Group on the Standards of Competence, the Computer Application Group and the Convention Translation Group. The first
meeting organized by the Training Group on the revision of syllabi for MET institutions was first held in November 1995 in Suzhou and subsequent meetings have been held this year. Other groups are also actively working on their specific aspects. Every preparatory task seems to have been carried out in good order. It can be taken for granted that as soon as the national legislation is formulated, the MET institutions will act accordingly.

3.2. Roles of Chinese Higher MET Institutions

Over the years a lot of studies have been conducted and many of them indicate that human error is the main cause of maritime casualties. In the past the training of seafarers was mainly left to the ship owners and mostly conducted on board ships. With the development of the shipping industry and the increasing sophistication of maritime equipment, school training for seafarers has become more and more important. In China the training of seafarers has been conducted mostly in schools for decades. The training of officers and the training of ratings is carried out separately at institutions different levels.

Maritime education involves a large portion of professional training. The education and training of seafarers is a unique model of the education system. However it cannot be separated from the whole national education system, which of course varies from country to country. In China lower-level professional education and training is incorporated in the secondary education system. That means that the education and training of ratings for seagoing vessels is the responsibility of vocational maritime schools, who enroll junior high school graduates only. The students in such schools undertake 3 or 4 years of schooling including several months' practice on board ships. Unlike secondary education, the education and training of marine officers falls within the scope of higher maritime education. The students are naturally obliged to go through the higher education procedures.
The roles of higher maritime institutions in China are mainly enacted according to the international conventions, national legislation and the goals set by the State Education Commission and the Ministry of Communications. Generally these roles may be categorized according to the following aspects.

3.2.1. General Education

The main task of all Chinese maritime colleges and universities is to provide the students with general education and training for certification of marine officers. Entrants are enrolled from the senior high school graduates after they have successfully passed the national higher education entrance examinations. The candidates are placed into a 3 years’ or 4 years’ program according to the scores they achieve and the colleges or universities they apply for. During the years they study at the institutions the students should first acquire the basic knowledge stipulated for higher education, such as advanced mathematics, general physics, philosophy, English language, physical culture etc., before they are taught professional knowledge and skills. Normally the students who have been educated and trained with 3 years’ schooling are entitled to a diploma and the certification of third mate or fourth engineer officer. Those who have come out with 4 years’ schooling can be conferred a bachelor degree and can apply for the certification of second mate or third engineer officer.

3.2.2. Refresher and Upgrading Courses

Another relatively important role of Chinese higher MET institutions is to offer refresher and upgrading courses for certification of masters and officers. As mentioned above the education and training of higher-level personnel is the responsibility of higher education institutions. ‘The soldier is not a good soldier who
does not want to become a marshal'. The situation is the same on board ships. Seafarers think of, and are entitled to, promotion. Ratings graduating from secondary vocational maritime schools or training centers can be promoted after some years of service on board ships. Lower rank officers can be further trained for higher certification. In most cases the candidates for such certification should receive approved education and training. Such education and training is often conducted on short courses of 3 to 6 months.

3.2.3. Basic Safety Training Courses

Basic safety training means the basic professional training for all seafarers including ratings and members of the catering department. This is also an important integral part of the institutions. The program is composed of 'Survival at Sea', 'Manoeuvring Survival Craft', 'Fire Fighting' and 'First Aid at Sea'. In addition there are some other training subjects for masters and deck officers, such as 'Radar Observer and Radar Simulator', 'Operational Use of Automatic Plotting Aids' and 'Radio Telephony', etc. Of course, the basic safety training for all seafarers can also be conducted by approved secondary maritime vocational schools, training centers or big shipping companies. However those three subjects for masters and deck officers can only be offered in higher maritime institutions. These training courses have been offered since 1985 after the promulgation of the Regulations Governing Basic Safety Training and Certification for Seafarers by the MSA in compliance with the Convention and the relevant resolutions adopted by the International Conference on Training and Certification of Seafarers.

3.2.4. Special Training Courses

Special training means the training for masters, officers and ratings serving on board special types of ships, such as oil tankers, chemical carriers, liquefied gas tankers, etc.
In accordance with STCW 1978 and MARPOL 73/78, China's MSA issued a circular in 1987 regarding the safety management and special training necessary for seafarers on board tankers and the personnel engaged in crude oil washing (COW). The circular required that all personnel concerned should be effectively trained and examined and those who have passed the examination should be endorsed in their 'Onboard Service Book'. Such training is also organized in short courses and conducted in the higher maritime institutions.

3.2.5. Advanced Studies

With the rapid development of science and technology, ships as well their equipment are becoming more and more automated and modernized. The new ship's dimension is larger and its speed is higher. The traffic density at sea is increasing and so is the complexity of the consignment, especially the dangerous cargoes. To meet the new requirements seafarers should be trained by qualified trainers. Chinese higher MET institutions shoulder such a new task. They are authorized to offer advanced courses at master level and doctoral level for young teachers and senior marine officers who intend to become competent instructors or researchers. These advanced courses cover a wide range of subjects in the shipping industry. Most of the graduates are appointed to teaching posts in higher MET institutions. The program started after 1980 and has proved to be satisfactory and effective.

3.2.6. Maritime Scientific Research

Scientific research is another important and indispensable part of work in higher education institutions. Apart from conventional teaching, Chinese higher MET institutions are also engaged in scientific research mainly concerning the maritime industry. In these institutions there are a great number of experts, scholars, professors and researchers. To help them carry out the research the government has been
funding the institutions in setting up various laboratories and research institutes. In recent years many achievements in the maritime industry have been made. Some of them have been applied in the industry and have produced great economic and social effects. By doing scientific research the instructors have upgraded themselves in their particular field and the students in turn have benefited from them. Nowadays every maritime college or university has its own school journals published periodically.

3.3. Brief Background of Chinese Higher MET Institutions

As stated above the role of Chinese higher MET institutions is sixfold. However the education and training of Chinese marine officers is the main responsibility of the higher MET institutions. Today there are eight higher MET institutions in China. They are directly or indirectly under the leadership of the Ministry of Communications. These institutions are located along the coast of China or by the Changjiang River (Yangtse River). In recent years they have trained roughly 3,000 officers each year. The graduate officers have been appointed to work in more than 200 shipping companies in mainland China and Hong Kong.

3.3.1. Dalian Maritime University

Dalian Maritime University was founded in 1953 by merging Shanghai Nautical College, Northeast Navigation College and Fujian Navigation School. The history of the three precursors can be traced back as far as to 1909 when the Shipping Management Department was established by Shanghai South Sea Public Affairs Institute (Nanyang School). DMU is now one of the key universities in China. The UN Development Program (UNDP) and IMO established in it the ‘Asia-Pacific Maritime Training Center’. The WMU set up its branch in it in 1985. DMU has grown to embrace five categories of maritime transport, engineering, management, law and economics, ranking first among its kind in the world in size and level of
education and is acclaimed by IMO as one of the most prestigious maritime institutions in the world.

DMU has six colleges of navigation, marine engineering, shipping management, market economics and law, international business and adult education, five additional faculties of social science, basic science, technical foreign languages, physical education and postgraduate study. It boasts 22 graduate disciplines, 12 specialities, four tutors for doctoral candidates and 9 tutors for master degree candidates. It has about 5,000 students and some 20 foreign students from several countries. DMU currently employs about 2,250 staff members. It has established formal ties of cooperation with five foreign institutions of the same kind. There are 56 laboratories in DMU including the advanced marine laboratory, satellite navigation laboratory, eight research institutes, three 10,000 ton-class ocean-going training ships, a harbor with several docks and a couple of factories for field work.

Over the past 40 years DMU has turned out more than 20,000 graduates. It has also trained more than 2,000 foreign students from more than 30 countries and regions.

3.3.2. Shanghai Maritime University

Shanghai Maritime University (SMU) was founded in 1958. It is a multi-disciplinary university. SMU embodies education in engineering, management, liberal arts and law with the technology of maritime transport and control engineering of communication and transport as its main activities. Now it runs two colleges, one dealing with general and the other the maritime industry, and seven departments covering electrical engineering, maritime transport management, maritime transport economics, international shipping, computer science, machinery, and foreign languages. The University has three additional divisions encompassing basic course teaching, postgraduate study and adult education.
SMU has a faculty and staff of about 1,900 and a student body of nearly 3,800 including more than 100 postgraduates. The University has developed rapidly in the last few years both in teaching and scientific research. In the University there are a great number of laboratories, training bases and research institutes, such as radar simulator, planetarium, computing center, aquatic training base, etc. Besides these, there are three 10,000-ton class ocean-going vessels for students' practice.

SMU has established friendly contacts and has academic exchanges with more than 20 countries and regions, such as Japan, Norway, UK, USA, etc. It has also offered several short courses with IMO and the UN Economic and Social Council for Asia and the Pacific.

Since its founding, SMU has trained more than 13,600 graduates. Among them about 1,000 have become captains or chief engineer officers.

3.3.3. Jimei Navigation Institute

Jimei Navigation Institute (JNI) is situated in Jimei Schools Village, Xiamen Special Economic Zone. It was founded in 1920 by the famous Chinese overseas patriot Mr. Chen Jiageng. In 1978 it was transformed from Jimei Navigation School (a secondary professional school) into Jimei College of Navigation (a college of three-year schooling). Approved by the State Education Commission in 1989, it was given the present name (an institute of four-year schooling).

Now JNI has four departments, namely marine navigation, marine engineering, electrical engineering and international shipping economics and management. In addition there are three teaching departments in basic courses, social science and adult
education. At present JNI has more than 2,200 students including a few postgraduates. It also trains students from Hong Kong and Macao.

JNI employs nearly 800 faculty and staff, of whom about 250 are full-time teachers. It has established friendly contacts and maintains academic exchanges with more than 20 countries and regions including Canada, Egypt, Hong Kong, Norway, Macao, Switzerland, Taiwan, UK, USA and so on.

The Institute has 22 specialized laboratories, three research bodies, an aquatic training center and an affiliated factory for engineering workmanship practice. For the purpose of students’ practice JNI owns a shipping company which operates a fleet including three ocean-going vessels and some smaller ones. One of the big ones is a container vessel.

Since 1920 JNI has turned out more than 20,000 graduates. Many of them have become captains or chief engineer officers or managers at home and abroad. The Institute enjoys a high prestige in South-east Asian countries and is named ‘a cradle for navigators’.

3.3.4. Other Higher Maritime Academies

The above three institutions are the most maritime oriented and important MET institutions in China. They are often called the major three in the maritime sector. However apart from them there are five other higher maritime academies. They are Qingdao Ocean Shipping Mariners College (QOSMC), Wuhan Transportation University (WTU), Guangzhou Advanced Navigation College (GANC), Shanghai Maritime Transport Workers University (SMTWU) and the Workers University of Changjiang National Shipping Corporation (WUCNSC).
QOSMC was founded with the name of Qingdao Marine Transport School in 1976 and extended into the present college in 1980. This is a special college for adults, directly under China Ocean Shipping (Group) Company (COSCO). Its main task is to train marine officers and engineers. Apart from conventional higher education for adults (3-year schooling), short training courses of various kinds are offered in the college. QOSMC has departments of navigation, marine engineering, shipping management and politics, and a basic course teaching department and a training center, offering seven specialities, namely marine navigation, marine engine control, marine electrical control, maritime radio communication, maritime transport management, ocean shipping accountancy and ship's political work. Now it has an enrollment of about 800 students and employs some 200 full-time teachers.

WTU has a history of about 50 years. Located in Wuhan city on the Changjiang River, the University originally focused on inland waterway transportation. In order to be geared to the needs of world trade, it has developed to include seafarers' education and training as well. WTU now consists of three colleges and 10 departments, namely shipping college, management college, adult education college, marine machinery engineering, marine power engineering, shipbuilding and ocean engineering, port and engineering machinery, computer science and automation, social sciences, civil engineering, post graduate studies, basic course teaching, and physical culture. Today WTU has a staff of around 2850, among whom there are more than 400 professors and associate professors, including 8 tutors who guide doctoral students.

GANC was founded three years ago based on Guangzhou Seamen's School. It provides sea-going education and training courses only. At present there are about 180 full-time teachers. SMTWU was established in 1978. It is an institution for adults, aiming mainly at training marine officers enrolled from the maritime industry. Now it employs about 140 full-time teachers. WUCNSC was set up in 1988. Like
SMTWU, WUCNSC is also an institution of higher education for adults who wish to become marine officers. Teachers in this institution are less than 100.

It should also be mentioned that under the influence of exporting seafarers in exchange for foreign currencies and in order to broaden the scope of school operations, in recent years a number of fishery colleges in China have been altering or expanding their courses to meet the needs of the situation. They also offer courses for marine officers both in navigation and marine engineering but on a much smaller scale. Some graduates have also been turned out. However their quality is still unknown.

3.4. General Survey of Advanced Maritime Education and Training in China

3.4.1. Main Scheme of Maritime Education and Training

Generally speaking either a deck officer or an engineer officer in China is required to complete 15 or 16 years of education including practical training. In other words a period of 15 or 16 years is a pre-requisite for applying for the first certification of competency. This period is roughly composed of five stages:

Stage I: Pre-career general education. The national education system requires that any candidate for entrance examination for higher education should complete 12 years of general education including six years at primary school, three years at junior high school and three years at senior high school. Senior high school students have the choice to major in a science stream or arts stream at the beginning of the second year. Higher maritime academies enroll students from the science stream.

Stage II: National entrance examination for higher education. The national entrance examination is compulsory for every candidate who wishes to receive higher
education. It is a very strict examination on fixed dates for the whole nation. Normally the senior high school graduates need a couple of months’ preparation. The examination is also mainly set for two streams. The students of the science stream take examinations composed of six subjects, namely mathematics, physics, chemistry, Chinese, foreign language and politics. The students of the arts stream are examined in mathematics, Chinese, foreign language, politics, history and geography, the last two subjects replacing physics and chemistry of the science stream. After the evaluation of the papers each province sets the minimum score lines for various types of colleges and universities. Applicants for sea-going courses of higher maritime education should meet some extra requirements, such as medical fitness and being male.

Stage III: Maritime education and training. As mentioned in 3.3. China has 8 main higher MET institutions. These institutions provide diploma or degree courses according to the duration of schooling. The subjects offered in the institutions are almost the same. Maritime students undertaking diploma courses (3-year program) have to complete about 2,200 classroom hours (50 minutes each) plus 35 weeks of training including onboard practice; while those doing degree courses are required to complete about 2,900 classroom hours and 40 weeks of training and practice. In recent years before their graduation the students are sent to practice for about four months on board ships owned by various shipping companies where they are going to work after graduation. This is also called ‘pre-assignment onboard training’. On their graduation they receive either the diploma or the bachelor degree together with the basic safety certificates they are entitled to. In addition they can get the ‘White Cover’ certificate of competency which indicates their academic qualification as a marine officer. As stipulated by the MSA the diploma holder can only be certificated as third mate or as fourth engineer officer, while the bachelor degree holder is entitled to certification as second mate or as third engineer officer.
Stage IV: Practice on board and sea service. On their graduation the students are sent to work on board ships in the shipping companies where they have undertaken pre-assignment onboard training. The graduates are required to practice and serve on board for at least 12 months. During this period they are only allowed to work as cadets.

Stage V: First certificates of competency. After 12 months on board the graduates can change their ‘White Cover’ certificates of competency with the ‘Red Cover’ ones at the same level and the same capacity if they prove competent. There is no further examination required because their graduation examinations are approved by the MSA and the Ministry of Communications. However the requirement of the 12 months’ practice and sea service is to be met by every graduate. This is their first certification of competency. Now they are permitted to serve as their certificates indicate.

The above five stages comprise the main scheme of Chinese MET. However this scheme is only for the purpose of first certification. The MET institutions provide some other short courses for higher certification. According to the New Rules on Examination and Certification of Seafarers of the P. R. China, 1987, candidates for certification of chief mate or second engineer officer should complete at least three months’ approved training in addition to 18 months’ sea service at the immediate lower rank. Candidates for certification of competency for master or chief engineer officer should also complete three months’ approved training in addition to 24 months’ sea service as chief mate or second engineer officer. In China such training is fully delegated to higher MET institutions. Therefore two other stages may be added to the whole scheme of maritime education and training. They are known as ‘pre-examination preparatory training’ and ‘examination and certification’.
Stage VI: Pre-examination preparatory training. Applicants who have completed
the specified sea service can apply for a short upgrading course through their shipping
companies. The companies, if possible, will arrange a longer shore leave during
which the applicant can attend the course. Normally the MET institutions plan the
courses at the beginning of each academic year and inform the shipping companies
accordingly. If there are enough applicants (at least eight for the sake of economic
efficiency) for the same course, such course will be offered. The MET institutions
charge the shipping companies concerned a certain amount of tuition.

Stage VII: Examinations and certification. Immediately after the upgrading
courses which usually start 3 months before the examinations, the candidates for
certification take the examinations. Unlike the graduation examination for the first
certification such examinations are supervised by the MSA at the various MET
institutions. The papers are sent to, and graded at, the various grading centers
appointed by the MSA.

Components for the certificate of chief mate are: a. Celestial navigation; b. Ship
collision prevention; c. Duties and regulations; d. Seamanship; e. Cargo carrying, and
manoeuvring; c. Ship collision prevention; d. Marine meteorology; e. Duties,
responsibilities, rules and regulations; f. English.

Components for certificate of second engineer officer include: a. Ship’s power
installation; b. Ship’s auxiliary machinery; c. Engine automation, and d. English.
Those for certificate of chief engineer officer comprise: a. Ship’s power installation; b.
Engine automation; c. Marine Engineering management; d. English.
If the candidate passes all the components, the MSA will issue him the relevant certificate of competency. However he cannot be immediately assigned the new post until he has served at least half a year as assistant.

3.4.2. Common Core of the Chinese Higher MET Curriculum

Navigation and marine engineering have long been described as both an art and a science. They are regarded as an art because their application involves the exercise of special skills and fine techniques which can be perfected only by experience and careful practice. They are a science because they are a branch of knowledge dealing with the development and use of methods, sophisticated instruments, etc.

Marine officer training is incorporated into higher education in the Chinese education system and therefore the nurturing of officers is not only a matter of hands-on training. Students are supposed to receive some formal higher education programs including basic theory and principles in addition to occupational training. Based on this concept all the Chinese MET institutions have developed their own curriculum but they are more or less the same. For study convenience and representation only two curricula (deck officers’ and engineer officers’) derived from the major three institutions (DMU, SMU and JNI) are to be examined. Each curriculum is made up of six categories and each category consists of a number of subjects.

3.4.2.1. Curriculum for Deck Officers

Curriculum for deck officers is divided into common courses, basic courses, specialized basic courses, specialized courses, optional courses and practical work. All the courses are made up of 38 subjects. Common courses contain 7 subjects in 738 classroom hours, basic course 7 subjects in 450 hours, specialized basic courses 4 subjects in 318 hours and specialized courses 20 subjects in 1292 hours. Optional
courses are provided with 15 subjects in 368 hours; however the students are not obliged to take them all. Practical work is allocated with 41 weeks including 5 weeks of military training.

In summary, during 4 years a deck students has to complete 2798 classroom and laboratory hours plus 41 weeks of practical work and 368 periods of optional classes. Specialized courses (or navigation courses) occupy 46 percent of the total classroom and laboratory hours. Apart from military training, there are only 36 weeks contributed to practical work relating to navigational field. The specific subjects and time allocated to each of them are provided in Appendix 4.

3.4.2.2. Curriculum for Engineer Officers

Again, curriculum for engineer officers is composed of common courses, basic courses, specialized basic courses, specialized courses, optional courses and practical work. The courses in total contain 35 subjects in 2880 classroom and laboratory hours. Common courses consist of 7 subjects in 668 classroom hours, basic courses 6 subjects in 494 hours, specialized basic courses 11 subjects in 682 hours and specialized courses 11 subjects in 836 hours, which take up only 40 percent of the total classroom hours. Optional courses have 10 component comprising 326 hours. There are 47 weeks for practical work, among which 5 weeks is allocated to military training. The specific subjects and actual time allocated to each of the subjects are given in Appendix 5.

3.4.3. Status of Instructors and Teaching Methods

As mentioned in 3.3. there are eight higher maritime institutions in China. They are directly or indirectly under the leadership of the Ministry of Communications. However the first three (DMU, SMU and JNI) are regarded as the representative
MET institutions. To illustrate the present status of the instructors and the teaching methods used, an analysis of these three institutions will be undertaken. To make it more straight-forward and easier to be understood, an examination of the following aspects will be helpful.

3.4.3.1. Age Structure of Instructors

According to the educational statistics of the Ministry of Communications in 1995, there are 1,378 full-time instructors in these three institutions (not including other personnel). Among them 320 are below 30 years old, 427 from 31 to 40, 225 from 41 to 50, 366 from 51 to 60 and 40 above 61 years old (60 is the retirement age). The above figures show that middle-aged instructors (41 to 49) are comparatively few. The percentage for each age period is illustrated by the following figure.

![Figure 1](image)

3.4.3.2. Instructors' Qualifications and Experience

Among those 1,378 instructors, 370 are postgraduates including 13 doctors and 357 masters. Below this category there are 83 postgraduate diploma holders. The rest are university or college graduates who are either bachelors or diploma holders. Most of them have been teaching since their graduation. Some of them have been on board ships and hold the certificates of competency but they are not too many. In these
three institutions there are only about 50 master mariner certificate or chief engineer officer certificate holders. Some instructors have not been teaching long since they have been transferred from the shipping industry or other organizations.

3.4.3.3. Academic Title Structures

The academic titles of Chinese higher education teachers are divided into four categories, namely full professors, associate professors, lecturers and assistants. The three institutions have 94 full professors, 449 associate professors, 618 lecturers and 217 assistants (They are illustrated by the following table.). Most full professors are at the same time doctoral or master tutors and dissertation supervisors. However 75 of them are over 56 years old. To be a postgraduate tutor, one must be at least an associate professor. The lecturers are the main teaching force. They are young and energetic but they still lack teaching experience. Except for some basic courses, assistants are normally not allowed to give lectures. Their main task is to assist the lecturers or professors in coaching undergraduates and correcting assignments.

<table>
<thead>
<tr>
<th>Full Professors</th>
<th>Associate Professors</th>
<th>Lecturers</th>
<th>Assistants</th>
</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>449</td>
<td>618</td>
<td>217</td>
</tr>
</tbody>
</table>

3.4.3.4. Teaching Methods of Instructors

Most instructors are diligent and conscientious in their work. They do their best to improve their teaching. However due to some objective causes their teaching methods are not satisfactory. In these three institutions, except for a few basic course teachers who have graduated from normal universities or colleges, new teachers are short of formal teaching training. Few of them know about pedagogy or educational psychology. Their teaching methods are what they remember from their former
teachers. Therefore most teachers have become accustomed to cramming (forced-feeding) methods of teaching because they always try to get as much message across to the students as possible. As a result, the class tends to be teacher centered. The students are put in such a passive position that they do not even have a chance to raise questions.

For example, such phenomenon commonly exists in English language class where student involvement and practice are very important. In some foreign countries a number of language teaching approaches have been practiced and have proved to be successful, such as the direct method, audio-lingual approach, audio-visual approach, cognitive approach, communicative approach (or functional approach), etc. But in China the traditional method which is also known as the classical method or grammar translation method has been used since foreign language began to be taught in the last century.

3.4.4. Examination and Assessment Practices

In China the examination and assessment of students, even for their first certification, is fully delegated to the MET institutions, while the role of the MSA in this case is limited to setting the criteria and issuing the certificates. However the MSA remains fully responsible for the examinations taken at the institutions for further certifications.

In the MET institutions any course offered is concluded with a written examination or a comprehensive assessment. Written examinations are always predominant over other forms of assessment because they are easy to supervise and grade. The examination components for the first certification for deck officers include 'Celestial Navigation', 'Terrestrial and Coastal Navigation', 'Collision Prevention', 'Navigational Aids', 'Marine Meteorology', 'Seamanship', 'Carriage of Goods by
Sea', 'Duties, Rules and Regulations', and 'English'. The components for engineer officers comprise 'Power Installation', 'Marine Auxiliary Machinery', 'Marine Engineering Management', 'Basic Theory of Marine Engines', 'Shipboard Electrical Engineering', 'Basic Ship Theory', and 'English'. Of course the above examinations are not taken together just before the students' graduation, but are taken immediately on the completion of the relevant subjects.

If a student fails an examination or an assessment he is given another re-examination at the beginning of the next semester. If he fails up to 3 examinations or assessments in an academic year, he must stay down. On the completion of all his studies the student who has failed one or more examination or assessment will not be conferred the bachelor degree or issued a diploma. In this case he should apply for another make-up examination after 12 months' practical sea service. If this is approved the student is informed of the time of the examination. This is the final chance. If he fails again, his first certification will be a tough task. He should reapply for it all over again and write all the examinations required for non-MET-school graduates.

Most of the examinations last for two hours. The examination questions are mainly of objective formats including true or false and multiple choice types. The paper is usually prepared by the instructor who acts as the examination supervisor and the paper grader as well. Although strict punishment is enforced these days, some students are still found to be cheating. This phenomenon shows no sign of ceasing.

3.5. Quality of Graduates
To some extent the quality of graduates reflects the quality of teaching in the institutions. In recent years Chinese higher MET institutions have turned out around 3,000 graduate marine officers each year. Of these graduates about 1,500 receive the bachelor degree, and the other half get the diploma. There are 3,714 graduates this year. Among them 1,645 are degree conferees and the rest are diploma holders. To be distributed among over 200 shipping companies in China, this figure is not great.

Under the instructions of the Ministry of Communications every institution has established a 'graduates career tracking investigation system'. The purpose of establishing this system is to evaluate the graduates to see how they apply their knowledge and whether they are competent at their work. The investigation is carried out at intervals of three or four years through three channels. The first channel is by sending questionnaires to the graduates. The second channel is by sending evaluation forms to the shipping companies or aboard ships where the graduates work. The third channel is by sending investigators from the institutions to meet some graduates and talk to the managers of some shipping companies. The feedbacks are synthetically analyzed. In this way the institutions are in a better position to know where the graduates’ merits and demerits are, and what the graduates and the shipping companies think necessary to be emphasized. Based on the analysis the institutions can adjust the course syllabus and improve their work.

According to the recent tracking investigation the graduates, generally speaking, have a good command of theoretical knowledge, skills and new technology. They are basically competent at their respective work. Most of them are eager to learn more and improve themselves. However demerits are also found. Their demerits are mainly as follows:

a. they are poor in English language skills, most of them having difficulty in English communication;

b. generally speaking, their hands-on ability is not satisfactory;
c. their knowledge is not wide enough, poor in organizing ability, management techniques and social contact capability;

d. they do not have a better understanding of maritime law, national and international rules and regulations;

e. some of the new graduates lack a sense of responsibility.
Chapter 4

A Comparison between the Revised Convention and Current Chinese MET

The last chapter analyzed the present situation of Chinese higher MET. It is the STCW’78 and the national legislation that provides the criteria and the guidance for its action. Over the years what has been done in China has almost been in line with the international convention and most of its seafarers in the national fleet are competent. However since the current STCW Convention does not explicitly stipulate the international qualification but leaves it ‘to the satisfaction of the Administration’ and the MET institutions are left each to do things in its own way, there are still some aspects which are not attended to properly. Furthermore, the revised Convention sets out new international requirements. There are no more standards or provisions left to the interpretation of the administration. In this regard every member government has no other choice but to manage to meet the international standards. Undoubtedly the gap between the present status and the standards of the revised Convention in China is not narrow as far as MET is concerned. A great deal of hard work has to be done to fill in this gap as early as possible. Based on the present situation and compared with the revised Convention, the gap may be found to exist in the following aspects:
4.1. Division of specialities

The introduction of a functional approach into the revised STCW Convention reflects the ever increasing wide application of high-tech onboard ships and the proper flexibility of the onboard complement due to the internationally inadequate supply of officers. Although the functional approach is not compulsory for the member States, it is a new trend and it does have a lot of merit. Actually, according to the revised Convention, the conventional certification in future will also bear the 'functional' principle. Therefore the traditional lay-out of specialities or departments in MET institutions in most countries faces a challenge of alteration.

The traditional division of specialities in Chinese higher MET institutions is almost the same. Four specialities are run in every institution although some institutions have some more specialities. They are Maritime Navigation for deck officers, Maritime Communication for radio operators, Marine Engineering for engineer officers and Marine Electrical Engineering for electrical engineer officers. Such lay-out is based on the departmental division on board ships. Although in recent years there is a tendency of combining Maritime Navigation and Maritime Communication department and Marine Engineering and Marine Electrical Engineering into Marine Engineering and Electric department, not all the institutions have the same combinations. Even for the forerunners who have already combined the specialities, the establishment of the teaching and research sections (the basic discipline teaching units in the institutions) remains unchanged and the students are still enrolled for four specialities separately.

As a matter of fact, the practice that the maritime navigation speciality trains deck officers, the maritime communication speciality radio operators, the marine engineering speciality engineer officers and the marine electrical engineering speciality electrical engineer officers is being challenged. Even the dual-purpose scheme is also
being debated. The revised STCW Convention requires that the seafarers should be trained according to the 'functions'. The trend indicates that the high quality seafarers of the 21st century should be versatile and professionally competent. The new type of seafarers will have a high degree of adaptability. They can work onboard high-tech ships as well as traditional ships no matter if these ships are departmentally certificated or functionally certificated. This indicates that the traditional division of speciality in MET institutions will not turn out qualified seafarers needed internationally in future. Therefore, like it or not, the specialities in all the Chinese MET institutions should first be reshaped.

4.2. Curriculum lay-out

The 1995 amendments to the STCW Convention are designed to address the inadequacies of the current Convention and improve overall standards of seafarers' competence worldwide. These amendments for the first time establish the uniform standards for the attainment of competence in particular maritime skills. The revised Convention contains specific criteria detailing the standards of knowledge, understanding and proficiency to be achieved in each element of competence and the criteria for evaluating them. To achieve competence in a seafaring career under the new requirements is not only a simple matter of theoretical knowledge pass-on and assessment in written examinations. In China the existing curriculum for MET based on theoretical knowledge seems to be out of place.

The Chinese traditional education system has long been criticized for its theoretical orientation. One of the many defects under such orientation is that the students achieve at a high level academically but are of low practical competency. This phenomenon also exists in MET. Seafaring is a special profession and MET is a bit different from some other professional education and training. Although it has been realized for many years that the seafaring profession needs a higher level of
practicality than theory, in reality practicality has not drawn enough attention from most people in the MET circle. The pure knowledge-based education and training system is always regarded as the right way of teaching and learning. Competency training has not really been put into practice. The following tables condensed from Appendices 4 and 5 show the deficiency in the curriculum lay-out and the percentage of time allocation:

Table 3: Curriculum lay-out and time allocation for deck officers

<table>
<thead>
<tr>
<th>Categories</th>
<th>Public Course</th>
<th>Basic Course</th>
<th>Specialised Basic Course</th>
<th>Specialised Course</th>
<th>Experim and Practi</th>
<th>Military Traini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Hours</td>
<td>738</td>
<td>382</td>
<td>266</td>
<td>1060</td>
<td>1196</td>
<td>120</td>
</tr>
<tr>
<td>Percentage in the Curriculum</td>
<td>19.62</td>
<td>10.15</td>
<td>7.07</td>
<td>28.18</td>
<td>31.79</td>
<td>3.19</td>
</tr>
</tbody>
</table>

Notes: 1) For the meanings of the categories, please refer to Appendix 4.

2) One week is converted into 24 classroom hours.

Table 4: Curriculum lay-out and time allocation for engineer officers

<table>
<thead>
<tr>
<th>Categories</th>
<th>Public Course</th>
<th>Basic Course</th>
<th>Specialised Basic Course</th>
<th>Specialised Course</th>
<th>Experim and Practi</th>
<th>Military Traini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Hours</td>
<td>668</td>
<td>444</td>
<td>590</td>
<td>744</td>
<td>1248</td>
<td>120</td>
</tr>
<tr>
<td>Percentage in the Curriculum</td>
<td>17.51</td>
<td>11.64</td>
<td>15.47</td>
<td>19.51</td>
<td>32.72</td>
<td>3.15</td>
</tr>
</tbody>
</table>

It is clearly shown in the last 2 tables that all the experiments and practice including on-job training in both specialities (departments) make up less than one third of the
curriculum. Being a professional education and training institution, this amount of
time allocated to this link is undoubtedly not adequate. A competency oriented
curriculum should not be like this.

4.3. Contents of Courses

Compared with the existing Convention, although the revised Convention does not
add many areas of knowledge to be grasped, it emphasizes the necessity of updating
training of the seafarers and competence acquisition. The shift from theoretical
knowledge-based training to competence-based training requires MET institutions to
rewrite the textbooks in order to readjust the contents of the courses. In addition
ship's technology, ship's position fixing techniques, cargo handling techniques, etc.
are changing rapidly. The content of the courses also needs updating.

In Chinese higher MET institutions today, textbooks come from various sources.
Most textbooks of the public courses and the basic courses come from other famous
universities or other authorized publishing houses. However most textbooks of the
specialized basic courses and the specialized courses are written or compiled by the
respective teachers. Some are of good quality, but some are very poorly constructed.
The main inadequacies in the poor textbooks are that errors are many and some
contents are out of date while new things cannot be found. Although there are some
IMO model courses to use for reference, many teachers are reluctant to do so because
some of them are not good at the English language and some of them insist on writing
or compiling their own for the purpose of academic title promotion. The latter reason
seems to be the main cause of the poor textbooks.

In Chinese higher education institutions today, the so-called 'works'—either articles
or books—is the decisive factor in academic title promotion. The reason for this is
that it can be easily assessed when the applicant's ability is evaluated overall. This is
often referred to as 'hardware' together with the academic degree of the applicant. Therefore many teachers who are not good at such work manage to come out with something published of their own although some of them may copy from here and there or from some other textbooks of other institutions. A few years ago the ex-president of JNI, Mr. Chen, criticized such phenomenon sharply. He pointed out critically that many of such textbooks are the products of "a pair of scissors and a bottle of glue". Very often when A has been promoted, B will reconstruct the textbooks based on the existing ones. When B has got promoted some day, C will continue the work in the same manner. Under the intensity of promotion chasing, the textbooks so constructed cannot be of good quality so neither can the content of courses.

4.4. Practical Teaching and Training

Practical teaching and training is an important link in MET. As stated earlier that MET is different from some other professional education. Although theory is important, practice is even more important. Correct ideas originate in practice. As Chairman Mao Zedong put it "Genuine knowledge comes from practice". Especially in the shipping industry practical training is of great significance.

The STCW'95 pays much attention to practice in competence training and assessment. This is also the requirement of education and training based on the 'functions'. The revised Convention specifies the compulsory requirements for seafarers with regard to various functions and levels, emphasizing the competency of applying knowledge into carrying out various functions.

Unquestionably, apart from the necessary classroom teaching, the acquisition of various areas of competence depends to a great extent on various practical teaching and hands-on training, laboratory experiments, workshop training, etc. Apparently,
much of the acquisition of competence for seafarers comes from the combination of theory and practice. However as can be seen from Tables 3 and 4 in 4.1., all the training time including experiments makes up less than one third of the total time of the curriculum in the Chinese MET institutions. This amount of time is far from enough.

It is apparent that the traditional over-emphasis of theory teaching (nearly 70% of the total schooling time) results in the reduction of practical training time, impeding the acquisition of real competency. The inadequacy of practical teaching and training, on the other hand, can also be attributed to the lack of equipment. In all the MET institutions the equipment is far from adequate for so many students. For a group of 35 to 40 students (the normal class size) it is not possible to allow everyone to try in person. Often only a couple of students are asked to perform under the guidance of the trainers while the others stand aside watching. Things can be even worse when the trainers are afraid of the students breaking the equipment as the trainers are responsible for the condition of the equipment in their charge. In this case the real hands-on opportunity is very rare. Lastly the separation of the teachers from the trainers also impedes the real acquisition of competency. In time theory is divorced from practice. In Chinese higher education institutions in general teachers and trainers are separate. They are two different groups of staff. Teachers are only responsible for theory teaching, while trainers take care of the students’ hands-on performance. In some institutions the status of the trainers is thought inferior to that of the academic teachers. Therefore the trainers’ enthusiasm can not be fully aroused and the students often feel dissatisfied and therefore disappointed during such training.
4.5. Special Training and Basic Safety Training

Special training and basic safety training are specified in Chapter V and Chapter VI of the STCW Convention. New provisions have been added in Chapter V of the revised Convention to require additional training for personnel on ro-ro passenger ships in crowd management, extra safety training, passenger safety, cargo safety and hull integrity and crisis management. In Chapter VI many more changes have been made. The amendments require that all seafarers should receive familiarization training or instruction so that they can respond in a sensible fashion to emergencies and that seafarers assigned specific safety or pollution prevention duties should receive basic training or appropriate instruction in personal survival, fire prevention and fire-fighting, elementary first aid and personal safety and social responsibilities. This chapter also contains standards of competence for personnel with special responsibilities concerning survival craft, rescue boats, fast rescue boats, medical care and advance fire-fighting, plus the relevant certification requirements.

In practice, most seafarers should already be receiving most of the required training, either at college or during seagoing service, as part of their existing training courses prior to qualification. However, nowadays, Chinese MET institutions only provide the four types of basic safety training, namely 'Survival at Sea', 'Manoeuvring Survival Craft', 'Fire Fighting' and 'First Aid at Sea'. As far as special training of personnel on tankers is concerned, very few institutions provide the required refresher training. As a result some seafarers serving on board tankers have not had a chance to receive such training. Special training of personnel on ro-ro passenger ships is a new subject in China and it has not yet drawn much attention from the people because nowadays there are only a couple of ro-ro passenger ships in China.

Although those four so-called basic safety training types are somewhat related to the new requirements, the new changes are more comprehensive. Expecting onboard
familiarization training which can be undertaken aboard because it varies from ship to
ship, depending on the type of vessel, most of the training presents another new task
for the Chinese MET institutions. In this regard, for example, new courses should be
developed and new textbooks written.

4.6. Instructors and Assessors and Their Methods

The revised STCW Convention stipulates in Section A-I/6 of the Code that "Each
Party should ensure that instructors, supervisors and assessors are appropriately
qualified for the particular types and levels of training or assessment of competence of
seafarers...". It is well known that the outcome of training and the quality of the
seafarers depend to a great extent upon the instructors and assessors. Are the
Chinese instructors and assessors appropriately qualified? An examination of the
following areas will give the answer.

4.6.1. Unbalanced Structures

Firstly, the educational background of some instructors is poor and some assessors
are not appropriately qualified. Among them higher academic degree holders are
fewer although the number has been increasing since the establishment of an academic
degree system in early 1980s. In the three main MET institutions, there are only 13
Ph.Ds and 357 master degree holders. Secondly, the age structure of the instructors
and assessors is not satisfactory either. The middle-aged group are fewer while this
age period is the prime time in a human's career. People at this age are experienced,
healthy, vigorous and energetic. Thirdly the academic title structure is not
reasonable. The number of higher academically titled instructors and assessors is not
adequate. There are only 94 full professors. What is more, there exists some corrupt
practice in academic title promotion. Some associate professors and full professors
are not really academically sound while some excellent young people are not appropriately promoted.

4.6.2. Lack of Practice and Hands-on Ability

It should be admitted that most of the instructors and assessors have profound theoretical knowledge in the fields they are engaged in. What they badly lack is practice and hands-on ability. Seafaring is a special profession. Hands-on ability is of great importance. Under the revised Convention, competence oriented training requires instructors and assessors to be also competent. An instructor or assessor without necessary conceptual knowledge and practice can never be competent. Among the specialized teachers, competency certificates holders are rare. One of the reasons is that when they gain higher competency certificates (certificates for master or chief engineer officer in particular) most of them will quit teaching because working aboard ships is more rewarding financially.

4.6.3. Impractical Teaching Method

Competency orientation does not only require instructors and assessors to gain more practice and hands-on ability, it also challenges the traditional methods of teaching and assessment. To some extent teaching methods determine the effect of teaching and learning. Under the traditional Chinese education system most instructors are accustomed to a 'cramming method' which is generally regarded by them as an easy way to transmit dense information and a better method to control the class. Faced with this approach, students seldom have any chance to raise a question. When it comes to an English class, for example, this method deprives the students of their practice opportunity, consequently making 'dumb' language learners.
4.6.4. Unrealistic Assessing Method

As stated earlier the Chinese MET system is knowledge-based with assessment by written examination. This system worked well enough in the past when the trainees had a lot of opportunities to apply their theoretical knowledge and gradually acquire the necessary skills under the guidance of more experienced officers. At present crews are becoming smaller and smaller while the equipment is becoming more and more sophisticated. This tendency does not allow many chances for the trainees to gain skills gradually on board. They should be better prepared than before.

Competence-based teaching should be matched with competence-based assessing. However the assessors are accustomed to written examinations. In China instructors also serve as assessors. They set the exam paper, supervise the exam and grade the paper. Looking through Table A-II/1 to Table A-VI/4-2 of the Code, it can be easily found that written examinations are only one method of demonstrating competence. Many areas of competence cannot be assessed only by answering questions on exam papers. Therefore the traditional assessing method needs reforming.

4.7. English Language Ability

People of the English speaking countries or of countries which use English as an official/second language do not have English communication difficulties. However this has been one of the biggest problems ever encountered by non-English speakers, particularly by the Chinese. Due to some well-known historical reasons, the English language has become the most important and widely used language in the world. Since shipping is an international industry, that English is adopted as the maritime communication language is now unquestionable.
With the development of maritime science and technology and an increasing combination of multinational crews, English is playing a more and more significant role in the shipping industry. Ignorance or inadequacy in the English language greatly endangers life, property and the marine environment. It is known that many maritime casualties can be attributed to a language communication barrier. For example, the disaster of Scandinavian Star in 1990 is a bitter lesson in this regard.

The revised Convention includes several references to expand English language requirements for seafarers. Officers of the navigational watch will be required to have a knowledge of written and spoken English adequate to understand navigational publications and information concerning the ship’s safety and operation, and be able to communicate with other ships and coast stations and multilingual crew, and use IMO Standard Maritime Communication Phrases. When required to comply with standards of competence for GMDSS radio operators and obtain GOC certificates they will also need a knowledge of English for the communication of information relevant to the safety of life at sea. Engine watch-keepers will be required to be able to interpret engineering publications and to speak clearly and comprehensively when making the communications needed to perform engineering duties.

However English language ability is always the most prominent weakness of the Chinese seafarers. This problem is often reflected from feedback provided by the graduates under career tracking investigations. The result can be attributed to the MET institutions but the institutions have their own difficulties. The poor situation is due to the following reasons:

4.7.1. Historical and Cultural Reasons

As an advanced nation and superpower in ancient times, China was too complacent to learn from others. It was not until the last century that China began to realize its
backwardness and the importance of information exchange. However serious restrictions still prevented the normal culture and language penetration. The formal English teaching and learning in schools did not start until the beginning of this century. Unfortunately English and Chinese belong to two totally different language systems. What is more, Chinese culture also differs from English culture. As is known to all, a language is never fully learned without an understanding of the culture. In other words the language is an integral part of the culture. These two great differences undoubtedly become the obstacles in English language acquisition for the Chinese people.

4.7.2. Education System

Psychologically and physiologically, children are superior to adolescents and adults in language acquisition. In China foreign languages are not taught in primary schools but in high schools and higher educational institutions. When students go to high schools they have already passed their prime time for language acquisition and are likely to become shy and tongue-tied. Today although some key urban primary schools have begun to teach children English from grade-5 at an experimental scale, the effort has proved to be in vain. Because such lucky children are few, when they go to high schools they are mixed with beginners, which means they have to start all over again. Starting from this stage, students are given 4 to 6 classroom periods (40 minutes each) a week. At colleges and universities English is taught only for the first two years.

4.7.3. English not Highly Valued

Chinese traditional education always attaches great importance to mathematics, physics and chemistry. There is a widespread maxim in China which reads "A good command of M (Mathematics), P (Physics), C (Chemistry) is better than ABC
(English) because it makes you confident and fearless whatever they do in the world". Some years ago English was not a compulsory component when high school graduates took the entrance examinations for college enrollment. In these days although English draws much attention from the people, they still think English is not of very much use since opportunities to communicate with foreigners are rare. So even if they are forced to learn English at schools, they are likely to forget it after graduation. It is estimated that among 1.2 billion Chinese people 0.3 billion of them have learned or are learning English. However those who can really speak English are extremely rare. Undoubtedly the fact that so many people have got involved in learning English with such an unsatisfactory outcome is a great waste of time and effort.

4.7.4. Unrealistic Teaching Method

The grammar translation method has been dominating the language teaching platform since foreign languages were taught in China. This method has been passed from generation to generation. Students are taught grammar rules and how to pay attention to morphology and syntax. Resulting from this method, reading and writing are emphasized more than listening and speaking. Consequently students are pretty good at reading but very poor in listening and speaking. Some years ago an overseas Chinese who is a Ph.D returned from the U.S. to Beijing and was asked some English grammar questions by his nephew, a high school student, but he could hardly answer any of them. Ironically enough, he spoke a few basic English sentences but his nephew could understand none of them. In the maritime sector the same things happen from time to time. The writer was told another story of a Chinese master mariner who is afraid of foreign pilots because he is not good at speaking English. Therefore when the pilot is on one side of the bridge the master will go to the other side.
4.8. Training Equipment and Facilities

To effectively implement the revised Convention, Chinese MET institutions face another problem, i.e. training equipment and facilities. As indicated in the Regulations especially in Code A of the Convention, many abilities or skills can only be gained with the help of equipment or facilities. A lot of teaching, evaluating and assessing activities depend to a great extent on the equipment and facilities. The traditional knowledge acquisition through classroom teaching is out-of-date. Similarly simple, old and out-of-date facilities can never catch up with the development of shipboard technology.

Although the use of radar and ARPA became compulsory in MET institutions some years ago in China, other aspects of training equipment and facilities still lag behind.

4.8.1. Training Ships

Ships for students' practice are indispensable in MET institutions. A lot of hands-on performance activities have to be carried out onboard ships. This is an unquestionable fact. What the students are shown and trained with should be those that embody the latest development in technology. However, among the training ships in the major institutions some of them are actually retired from some shipping companies (they are not only second-hand but several-handed with many decades of service). The onboard equipment breaks down from time to time which often poses a dangerous situation while a lot of students are aboard. Some trainers say ironically that such old things can really train the students' ability to meet an emergency.
4.8.2. Simulators

The existing simulators are sufficient for the mandatory types of simulation required under Code A of the revised Convention. However they are not fully utilized. Compared with the recommended performance standards for non-mandatory types of simulation, Chinese MET institutions have a great deal to do. It is expected that requirements for other simulator based training and assessment will be introduced in the not too distant future.

4.8.3. Computers

With the development in ship automation, an understanding of computer applications is of paramount importance for seafarers. In addition, computers are helpful and effective in maritime education and training. Apart from being used with some forms of simulators, computers have great potential in other forms of computer-aided teaching and learning activities. However in the MET institutions computers are seriously inadequate. For example, JNI has only one computer laboratory equipped with about 30 old computers. It is hard to imagine what kind of a situation it is with more than 2000 students sharing those cranky things.

4.8.4. Other Equipment and Facilities

Training ships, simulators and computers are the major essential pieces of equipment and facilities needed by MET institutions. Other equipment and facilities include those in the various laboratories and those used as visual teaching aids. In today's Chinese MET institutions the equipment and facilities can be described with two words 'inadequate' and 'out-of-date'. From the bulky machines such as marine engines to the cheapest apparatus such as overhead projectors the new and modern ones are really rare.
4.9. Quality Standards System

In the revised Convention there are provisions that require each party to ensure that all activities which give effect to the requirements are continuously monitored through a quality assurance system, whether they are carried out by other entities under its authority or carried out within a government ministry, department or organization. These activities are to ensure achievement of defined objectives, including those concerning the qualifications and experience of instructors and assessors. In addition each party shall also ensure that an evaluation is periodically undertaken by qualified persons who are not themselves involved in the activities concerned. The information relating to the evaluation shall be communicated to IMO. In other words instructors and assessors as well as all training and assessment activities should be qualified and be monitored through a quality assurance system.

‘Quality standards’ in MET means to “Say what you do and then show that you do what you say”. A quality assurance system is the whole set of policies and standards and, what is more important, its mechanisms for evaluating or auditing how the activities are carried out. The introduction of quality standards which involve both internal quality assurance and external independent quality audit creates great pressure on MET institutions. However the member States cannot wait and see because of the difficulty in establishing the effective quality standards system. In this respect Chinese MET institutions are confronted with a new challenge due to the following deficiencies.

4.9.1. Implicit Objectives

The current STCW Convention leaves the standards to the interpretation of the Administration. This results in the turnout of substandard seafarers. Ideal standards depend on clearly defined objectives. Unfortunately, none of the Chinese MET
institutions has a clear mission statement. Generally speaking, they have their own implicit objectives and they set standards accordingly. However the standards vary from one institution to another because of the freedom allowed to the institutions by the Administration. It is known that the international standards set out in the revised Convention are no longer left to the interpretation of each member State. They should be achieved through necessary monitoring, evaluating, auditing and reporting mechanisms. Compared with the revised Convention, the Chinese standards are not high enough especially those regarding the new requirements and some institution leaders do not know what the right standards are. This is partly because the objectives are not explicitly defined.

4.9.2. Inadequate Internal Quality Reviews

In each Chinese MET institution there are a number of departments and a lot of personnel in charge of teacher and student matters. Nonetheless, often times 'too many cooks spoil the broth'. Normally in each institution there is a Presidential Office, Party Secretary Office, Personnel Division, Studies Division, Propaganda Division, Quasi-Military Management Division, Youth League Committee, Students' Affair Division, Academic Committee and so on. Some of them are something more in name than in reality. For example, the Academic Committee has nothing to do with teaching and studying activities. In addition there are many non-teaching staff in respective departments which the students belong to. They have some control over teachers and students. These personnel are deans, secretaries, form masters, class tutors, etc. (There are no suitable English equivalents.). All these relative authorities can give directions regarding the affairs of students as well as teachers. However few of them really know how to monitor the teaching, assessing and studying activities. They have no work plans and no clear work division and often lack coordination. In the end nobody is really responsible for the quality reviews.
Although there are some policies and standards regarding staff qualifications and students enrollment, they are not very well implemented. The recruitment of teachers lacks overall evaluation of the applicant but depends on mere recommendation and introduction by the applicant’s relatives or acquaintances. In some cases the enrollment of students is not very well controlled because of the inadequacy of applicants.

4.9.3. Lack of External Audit

Since their graduates are exempted from the national examination for the first certification, the institutions are free from outside pressure. Over the years the competent authorities have never tried or considered to carry out some sort of external evaluation of MET institutions. Although almost all the institutions insist that they have been doing what they are supposed to do, the outcome is not satisfactory. The fact that each institution does things in its own way results in different outcomes and there is no periodical external auditing, it is hard to tell which institution turns out the most qualified seafarers.

4.10. Financial Problems

Although the revised STCW Convention does not specify how much a government should spend on MET institutions, a government cannot easily meet the requirements without adequate funding. The Chinese MET institutions are run by the government and funds certainly come from it. However, all the institutions have difficulty with their financial situation. With the rapid growth of the national economy, the salary of the staff keeps increasing. At the same time government’s funding in MET institutions increases at a very low rate. The funds are far from enough to maintain the running of the institutions. Take INI for example, nearly 90% of the funds from the government in 1995 went on the staff’s salary. What is more the prices keep
going up day by day. As a result this institution could not afford new equipment and facilities. Even for the library the expenditure on purchasing new literature has been reduced again and again. Some institution leaders sigh with emotion that if the financial problem can not be solved, the implementation of the revised STCW Convention is impeded because the financial problem dominates all the other problems facing the MET institutions.
Chapter 4

A Comparison between the Revised Convention and Current Chinese MET

The last chapter analyzed the present situation of Chinese higher MET. It is the STCW’78 and the national legislation that provides the criteria and the guidance for its action. Over the years what has been done in China has almost been in line with the international convention and most of its seafarers in the national fleet are competent. However since the current STCW Convention does not explicitly stipulate the international qualification but leaves it ‘to the satisfaction of the Administration’ and the MET institutions are left each to do things in its own way, there are still some aspects which are not attended to properly. Furthermore, the revised Convention sets out new international requirements. There are no more standards or provisions left to the interpretation of the administration. In this regard every member government has no other choice but to manage to meet the international standards. Undoubtedly the gap between the present status and the standards of the revised Convention in China is not narrow as far as MET is concerned. A great deal of hard work has to be done to fill in this gap as early as possible. Based on the present situation and compared with the revised Convention, the gap may be found to exist in the following aspects:
4.1. Division of specialities

The introduction of a functional approach into the revised STCW Convention reflects the ever increasing wide application of high-tech onboard ships and the proper flexibility of the onboard complement due to the internationally inadequate supply of officers. Although the functional approach is not compulsory for the member States, it is a new trend and it does have a lot of merit. Actually, according to the revised Convention, the conventional certification in future will also bear the 'functional' principle. Therefore the traditional lay-out of specialities or departments in MET institutions in most countries faces a challenge of alteration.

The traditional division of specialities in Chinese higher MET institutions is almost the same. Four specialities are run in every institution although some institutions have some more specialities. They are Maritime Navigation for deck officers, Maritime Communication for radio operators, Marine Engineering for engineer officers and Marine Electrical Engineering for electrical engineer officers. Such lay-out is based on the departmental division on board ships. Although in recent years there is a tendency of combining Maritime Navigation and Maritime Communication into Maritime Navigation and Communication department and Marine Engineering and Marine Electrical Engineering into Marine Engineering and Electric department, not all the institutions have the same combinations. Even for the forerunners who have already combined the specialities, the establishment of the teaching and research sections (the basic discipline teaching units in the institutions) remains unchanged and the students are still enrolled for four specialities separately.

As a matter of fact, the practice that the maritime navigation speciality trains deck officers, the maritime communication speciality radio operators, the marine engineering speciality engineer officers and the marine electrical engineering speciality electrical engineer officers is being challenged. Even the dual-purpose scheme is also
being debated. The revised STCW Convention requires that the seafarers should be trained according to the 'functions'. The trend indicates that the high quality seafarers of the 21st century should be versatile and professionally competent. The new type of seafarers will have a high degree of adaptability. They can work onboard high-tech ships as well as traditional ships no matter if these ships are departmentally certificated or functionally certificated. This indicates that the traditional division of speciality in MET institutions will not turn out qualified seafarers needed internationally in future. Therefore, like it or not, the specialities in all the Chinese MET institutions should first be reshaped.

4.2. Curriculum lay-out

The 1995 amendments to the STCW Convention are designed to address the inadequacies of the current Convention and improve overall standards of seafarers' competence worldwide. These amendments for the first time establish the uniform standards for the attainment of competence in particular maritime skills. The revised Convention contains specific criteria detailing the standards of knowledge, understanding and proficiency to be achieved in each element of competence and the criteria for evaluating them. To achieve competence in a seafaring career under the new requirements is not only a simple matter of theoretical knowledge pass-on and assessment in written examinations. In China the existing curriculum for MET based on theoretical knowledge seems to be out of place.

The Chinese traditional education system has long been criticized for its theoretical orientation. One of the many defects under such orientation is that the students achieve at a high level academically but are of low practical competency. This phenomenon also exists in MET. Seafaring is a special profession and MET is a bit different from some other professional education and training. Although it has been realized for many years that the seafaring profession needs a higher level of
practicality than theory, in reality practicality has not drawn enough attention from most people in the MET circle. The pure knowledge-based education and training system is always regarded as the right way of teaching and learning. Competency training has not really been put into practice. The following tables condensed from Appendices 4 and 5 show the deficiency in the curriculum lay-out and the percentage of time allocation:

### Table 3: Curriculum lay-out and time allocation for deck officers

<table>
<thead>
<tr>
<th>Categories</th>
<th>Public Course</th>
<th>Basic Course</th>
<th>Special d Basic Course</th>
<th>Special d Cour</th>
<th>Experim and Practi</th>
<th>Milita Traini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Hours</td>
<td>738</td>
<td>382</td>
<td>266</td>
<td>1060</td>
<td>1196</td>
<td>120</td>
</tr>
<tr>
<td>Percentage in the Curriculum</td>
<td>19.62</td>
<td>10.15</td>
<td>7.07</td>
<td>28.18</td>
<td>31.79</td>
<td>3.19</td>
</tr>
</tbody>
</table>

Notes: 1) For the meanings of the categories, please refer to Appendix 4.

2) One week is converted into 24 classroom hours.

### Table 4: Curriculum lay-out and time allocation for engineer officers

<table>
<thead>
<tr>
<th>Categories</th>
<th>Public Course</th>
<th>Basic Course</th>
<th>Special d Basic Course</th>
<th>Special d Cour</th>
<th>Experim and Practi</th>
<th>Milita Traini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Hours</td>
<td>668</td>
<td>444</td>
<td>590</td>
<td>744</td>
<td>1248</td>
<td>120</td>
</tr>
<tr>
<td>Percentage in the Curriculum</td>
<td>17.51</td>
<td>11.64</td>
<td>15.47</td>
<td>19.51</td>
<td>32.72</td>
<td>3.15</td>
</tr>
</tbody>
</table>

It is clearly shown in the last 2 tables that all the experiments and practice including on-job training in both specialities (departments) make up less than one third of the
Being a professional education and training institution, this amount of time allocated to this link is undoubtedly not adequate. A competency oriented curriculum should not be like this.

4.3. Contents of Courses

Compared with the existing Convention, although the revised Convention does not add many areas of knowledge to be grasped, it emphasizes the necessity of updating training of the seafarers and competence acquisition. The shift from theoretical knowledge-based training to competence-based training requires MET institutions to rewrite the textbooks in order to readjust the contents of the courses. In addition, ship's technology, ship's position fixing techniques, cargo handling techniques, etc. are changing rapidly. The content of the courses also needs updating.

In Chinese higher MET institutions today, textbooks come from various sources. Most textbooks of the public courses and the basic courses come from other famous universities or other authorized publishing houses. However most textbooks of the specialized basic courses and the specialized courses are written or compiled by the respective teachers. Some are of good quality, but some are very poorly constructed. The main inadequacies in the poor textbooks are that errors are many and some contents are out of date while new things cannot be found. Although there are some IMO model courses to use for reference, many teachers are reluctant to do so because some of them are not good at the English language and some of them insist on writing or compiling their own for the purpose of academic title promotion. The latter reason seems to be the main cause of the poor textbooks.

In Chinese higher education institutions today, the so-called 'works'—either articles or books—is the decisive factor in academic title promotion. The reason for this is that it can be easily assessed when the applicant's ability is evaluated overall. This is
often referred to as ‘hardware’ together with the academic degree of the applicant. Therefore many teachers who are not good at such work manage to come out with something published of their own although some of them may copy from here and there or from some other textbooks of other institutions. A few years ago the ex-president of JNI, Mr. Chen, criticized such phenomenon sharply. He pointed out critically that many of such textbooks are the products of “a pair of scissors and a bottle of glue”. Very often when A has been promoted, B will reconstruct the textbooks based on the existing ones. When B has got promoted some day, C will continue the work in the same manner. Under the intensity of promotion chasing, the textbooks so constructed cannot be of good quality so neither can the content of courses.

4.4. Practical Teaching and Training

Practical teaching and training is an important link in MET. As stated earlier that MET is different from some other professional education. Although theory is important, practice is even more important. Correct ideas originate in practice. As Chairman Mao Zedong put it “Genuine knowledge comes from practice”. Especially in the shipping industry practical training is of great significance.

The STCW'95 pays much attention to practice in competence training and assessment. This is also the requirement of education and training based on the ‘functions’. The revised Convention specifies the compulsory requirements for seafarers with regard to various functions and levels, emphasizing the competency of applying knowledge into carrying out various functions.

Unquestionably, apart from the necessary classroom teaching, the acquisition of various areas of competence depends to a great extent on various practical teaching and hands-on training, laboratory experiments, workshop training, etc. Apparently,
much of the acquisition of competence for seafarers comes from the combination of theory and practice. However as can be seen from Tables 3 and 4 in 4.1., all the training time including experiments makes up less than one third of the total time of the curriculum in the Chinese MET institutions. This amount of time is far from enough.

It is apparent that the traditional over-emphasis of theory teaching (nearly 70% of the total schooling time) results in the reduction of practical training time, impeding the acquisition of real competency. The inadequacy of practical teaching and training, on the other hand, can also be attributed to the lack of equipment. In all the MET institutions the equipment is far from adequate for so many students. For a group of 35 to 40 students (the normal class size) it is not possible to allow everyone to try in person. Often only a couple of students are asked to perform under the guidance of the trainers while the others stand aside watching. Things can be even worse when the trainers are afraid of the students breaking the equipment as the trainers are responsible for the condition of the equipment in their charge. In this case the real hands-on opportunity is very rare. Lastly the separation of the teachers from the trainers also impedes the real acquisition of competency. In time theory is divorced from practice. In Chinese higher education institutions in general teachers and trainers are separate. They are two different groups of staff. Teachers are only responsible for theory teaching, while trainers take care of the students' hands-on performance. In some institutions the status of the trainers is thought inferior to that of the academic teachers. Therefore the trainers' enthusiasm can not be fully aroused and the students often feel dissatisfied and therefore disappointed during such training.
4.5. Special Training and Basic Safety Training

Special training and basic safety training are specified in Chapter V and Chapter VI of the STCW Convention. New provisions have been added in Chapter V of the revised Convention to require additional training for personnel on ro-ro passenger ships in crowd management, extra safety training, passenger safety, cargo safety and hull integrity and crisis management. In Chapter VI many more changes have been made. The amendments require that all seafarers should receive familiarization training or instruction so that they can respond in a sensible fashion to emergencies and that seafarers assigned specific safety or pollution prevention duties should receive basic training or appropriate instruction in personal survival, fire prevention and fire-fighting, elementary first aid and personal safety and social responsibilities. This chapter also contains standards of competence for personnel with special responsibilities concerning survival craft, rescue boats, fast rescue boats, medical care and advance fire-fighting, plus the relevant certification requirements.

In practice, most seafarers should already be receiving most of the required training, either at college or during seagoing service, as part of their existing training courses prior to qualification. However, nowadays, Chinese MET institutions only provide the four types of basic safety training, namely ‘Survival at Sea’, ‘Manoeuvring Survival Craft’, ‘Fire Fighting’ and ‘First Aid at Sea’. As far as special training of personnel on tankers is concerned, very few institutions provide the required refresher training. As a result some seafarers serving on board tankers have not had a chance to receive such training. Special training of personnel on ro-ro passenger ships is a new subject in China and it has not yet drawn much attention from the people because nowadays there are only a couple of ro-ro passenger ships in China.

Although those four so-called basic safety training types are somewhat related to the new requirements, the new changes are more comprehensive. Excepting onboard
familiarization training which can be undertaken aboard because it varies from ship to
ship, depending on the type of vessel, most of the training presents another new task
for the Chinese MET institutions. In this regard, for example, new courses should be
developed and new textbooks written.

4.6. Instructors and Assessors and Their Methods

The revised STCW Convention stipulates in Section A-I/6 of the Code that "Each
Party should ensure that instructors, supervisors and assessors are appropriately
qualified for the particular types and levels of training or assessment of competence of
seafarers...". It is well known that the outcome of training and the quality of the
seafarers depend to a great extent upon the instructors and assessors. Are the
Chinese instructors and assessors appropriately qualified? An examination of the
following areas will give the answer.

4.6.1. Unbalanced Structures

Firstly, the educational background of some instructors is poor and some assessors
are not appropriately qualified. Among them higher academic degree holders are
fewer although the number has been increasing since the establishment of an academic
degree system in early 1980s. In the three main MET institutions, there are only 13
Ph.Ds and 357 master degree holders. Secondly, the age structure of the instructors
and assessors is not satisfactory either. The middle-aged group are fewer while this
age period is the prime time in a human's career. People at this age are experienced,
healthy, vigorous and energetic. Thirdly the academic title structure is not
reasonable. The number of higher academically titled instructors and assessors is not
adequate. There are only 94 full professors. What is more, there exists some corrupt
practice in academic title promotion. Some associate professors and full professors
are not really academically sound while some excellent young people are not appropriately promoted.

4.6.2. Lack of Practice and Hands-on Ability

It should be admitted that most of the instructors and assessors have profound theoretical knowledge in the fields they are engaged in. What they badly lack is practice and hands-on ability. Seafaring is a special profession. Hands-on ability is of great importance. Under the revised Convention, competence oriented training requires instructors and assessors to be also competent. An instructor or assessor without necessary conceptual knowledge and practice can never be competent. Among the specialized teachers, competency certificates holders are rare. One of the reasons is that when they gain higher competency certificates (certificates for master or chief engineer officer in particular) most of them will quit teaching because working aboard ships is more rewarding financially.

4.6.3. Impractical Teaching Method

Competency orientation does not only require instructors and assessors to gain more practice and hands-on ability, it also challenges the traditional methods of teaching and assessment. To some extent teaching methods determine the effect of teaching and learning. Under the traditional Chinese education system most instructors are accustomed to a ‘cramming method’ which is generally regarded by them as an easy way to transmit dense information and a better method to control the class. Faced with this approach, students seldom have any chance to raise a question. When it comes to an English class, for example, this method deprives the students of their practice opportunity, consequently making ‘dumb’ language learners.
4.6.4. Unrealistic Assessing Method

As stated earlier the Chinese MET system is knowledge-based with assessment by written examination. This system worked well enough in the past when the trainees had a lot of opportunities to apply their theoretical knowledge and gradually acquire the necessary skills under the guidance of more experienced officers. At present crews are becoming smaller and smaller while the equipment is becoming more and more sophisticated. This tendency does not allow many chances for the trainees to gain skills gradually on board. They should be better prepared than before.

Competence-based teaching should be matched with competence-based assessing. However the assessors are accustomed to written examinations. In China instructors also serve as assessors. They set the exam paper, supervise the exam and grade the paper. Looking through Table A-II/1 to Table A-VI/4-2 of the Code, it can be easily found that written examinations are only one method of demonstrating competence. Many areas of competence cannot be assessed only by answering questions on exam papers. Therefore the traditional assessing method needs reforming.

4.7. English Language Ability

People of the English speaking countries or of countries which use English as an official/second language do not have English communication difficulties. However this has been one of the biggest problems ever encountered by non-English speakers, particularly by the Chinese. Due to some well-known historical reasons, the English language has become the most important and widely used language in the world. Since shipping is an international industry, that English is adopted as the maritime communication language is now unquestionable.
With the development of maritime science and technology and an increasing combination of multinational crews, English is playing a more and more significant role in the shipping industry. Ignorance or inadequacy in the English language greatly endangers life, property and the marine environment. It is known that many maritime casualties can be attributed to a language communication barrier. For example, the disaster of Scandinavian Star in 1990 is a bitter lesson in this regard.

The revised Convention includes several references to expand English language requirements for seafarers. Officers of the navigational watch will be required to have a knowledge of written and spoken English adequate to understand navigational publications and information concerning the ship’s safety and operation, and be able to communicate with other ships and coast stations and multilingual crew, and use IMO Standard Maritime Communication Phrases. When required to comply with standards of competence for GMDSS radio operators and obtain GOC certificates they will also need a knowledge of English for the communication of information relevant to the safety of life at sea. Engine watch-keepers will be required to be able to interpret engineering publications and to speak clearly and comprehensively when making the communications needed to perform engineering duties.

However English language ability is always the most prominent weakness of the Chinese seafarers. This problem is often reflected from feedback provided by the graduates under career tracking investigations. The result can be attributed to the MET institutions but the institutions have their own difficulties. The poor situation is due to the following reasons:

4.7.1. Historical and Cultural Reasons

As an advanced nation and superpower in ancient times, China was too complacent to learn from others. It was not until the last century that China began to realize its
backwardness and the importance of information exchange. However serious restrictions still prevented the normal culture and language penetration. The formal English teaching and learning in schools did not start until the beginning of this century. Unfortunately English and Chinese belong to two totally different language systems. What is more, Chinese culture also differs from English culture. As is known to all, a language is never fully learned without an understanding of the culture. In other words the language is an integral part of the culture. These two great differences undoubtedly become the obstacles in English language acquisition for the Chinese people.

4.7.2. Education System

Psychologically and physiologically, children are superior to adolescents and adults in language acquisition. In China foreign languages are not taught in primary schools but in high schools and higher educational institutions. When students go to high schools they have already passed their prime time for language acquisition and are likely to become shy and tongue-tied. Today although some key urban primary schools have begun to teach children English from grade-5 at an experimental scale, the effort has proved to be in vain. Because such lucky children are few, when they go to high schools they are mixed with beginners, which means they have to start all over again. Starting from this stage, students are given 4 to 6 classroom periods (40 minutes each) a week. At colleges and universities English is taught only for the first two years.

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4.8. Training Equipment and Facilities

To effectively implement the revised Convention, Chinese MET institutions face another problem, i.e. training equipment and facilities. As indicated in the Regulations especially in Code A of the Convention, many abilities or skills can only be gained with the help of equipment or facilities. A lot of teaching, evaluating and assessing activities depend to a great extent on the equipment and facilities. The traditional knowledge acquisition through classroom teaching is out-of-date. Similarly simple, old and out-of-date facilities can never catch up with the development of shipboard technology.

Although the use of radar and ARPA became compulsory in MET institutions some years ago in China, other aspects of training equipment and facilities still lag behind.

4.8.1. Training Ships

Ships for students' practice are indispensable in MET institutions. A lot of hands-on performance activities have to be carried out onboard ships. This is an unquestionable fact. What the students are shown and trained with should be those that embody the latest development in technology. However, among the training ships in the major institutions some of them are actually retired from some shipping companies (they are not only second-hand but several-handed with many decades of service). The onboard equipment breaks down from time to time which often poses a dangerous situation while a lot of students are aboard. Some trainers say ironically that such old things can really train the students' ability to meet an emergency.
4.8.2. Simulators

The existing simulators are sufficient for the mandatory types of simulation required under Code A of the revised Convention. However they are not fully utilized. Compared with the recommended performance standards for non-mandatory types of simulation, Chinese MET institutions have a great deal to do. It is expected that requirements for other simulator based training and assessment will be introduced in the not too distant future.

4.8.3. Computers

With the development in ship automation, an understanding of computer applications is of paramount importance for seafarers. In addition, computers are helpful and effective in maritime education and training. Apart from being used with some forms of simulators, computers have great potential in other forms of computer-aided teaching and learning activities. However in the MET institutions computers are seriously inadequate. For example, JNI has only one computer laboratory equipped with about 30 old computers. It is hard to imagine what kind of a situation it is with more than 2000 students sharing those cranky things.

4.8.4. Other Equipment and Facilities

Training ships, simulators and computers are the major essential pieces of equipment and facilities needed by MET institutions. Other equipment and facilities include those in the various laboratories and those used as visual teaching aids. In today's Chinese MET institutions the equipment and facilities can be described with two words 'inadequate' and 'out-of-date'. From the bulky machines such as marine engines to the cheapest apparatus such as overhead projectors the new and modern ones are really rare.
4.9. Quality Standards System

In the revised Convention there are provisions that require each party to ensure that all activities which give effect to the requirements are continuously monitored through a quality assurance system, whether they are carried out by other entities under its authority or carried out within a government ministry, department or organization. These activities are to ensure achievement of defined objectives, including those concerning the qualifications and experience of instructors and assessors. In addition each party shall also ensure that an evaluation is periodically undertaken by qualified persons who are not themselves involved in the activities concerned. The information relating to the evaluation shall be communicated to IMO. In other words instructors and assessors as well as all training and assessment activities should be qualified and be monitored through a quality assurance system.

‘Quality standards’ in MET means to “Say what you do and then show that you do what you say”. A quality assurance system is the whole set of policies and standards and, what is more important, its mechanisms for evaluating or auditing how the activities are carried out. The introduction of quality standards which involve both internal quality assurance and external independent quality audit creates great pressure on MET institutions. However the member States cannot wait and see because of the difficulty in establishing the effective quality standards system. In this respect Chinese MET institutions are confronted with a new challenge due to the following deficiencies.

4.9.1. Implicit Objectives

The current STCW Convention leaves the standards to the interpretation of the Administration. This results in the turnout of substandard seafarers. Ideal standards depend on clearly defined objectives. Unfortunately, none of the Chinese MET
institutions has a clear mission statement. Generally speaking, they have their own implicit objectives and they set standards accordingly. However the standards vary from one institution to another because of the freedom allowed to the institutions by the Administration. It is known that the international standards set out in the revised Convention are no longer left to the interpretation of each member State. They should be achieved through necessary monitoring, evaluating, auditing and reporting mechanisms. Compared with the revised Convention, the Chinese standards are not high enough especially those regarding the new requirements and some institution leaders do not know what the right standards are. This is partly because the objectives are not explicitly defined.

4.9.2. Inadequate Internal Quality Reviews

In each Chinese MET institution there are a number of departments and a lot of personnel in charge of teacher and student matters. Nonetheless, often times 'too many cooks spoil the broth'. Normally in each institution there is a Presidential Office, Party Secretary Office, Personnel Division, Studies Division, Propaganda Division, Quasi-Military Management Division, Youth League Committee, Students' Affair Division, Academic Committee and so on. Some of them are something more in name than in reality. For example, the Academic Committee has nothing to do with teaching and studying activities. In addition there are many non-teaching staff in respective departments which the students belong to. They have some control over teachers and students. These personnel are deans, secretaries, form masters, class tutors, etc. (There are no suitable English equivalents.) All these relative authorities can give directions regarding the affairs of students as well as teachers. However few of them really know how to monitor the teaching, assessing and studying activities. They have no work plans and no clear work division and often lack coordination. In the end nobody is really responsible for the quality reviews.
Although there are some policies and standards regarding staff qualifications and students enrollment, they are not very well implemented. The recruitment of teachers lacks overall evaluation of the applicant but depends on mere recommendation and introduction by the applicant’s relatives or acquaintances. In some cases the enrollment of students is not very well controlled because of the inadequacy of applicants.

4.9.3. Lack of External Audit

Since their graduates are exempted from the national examination for the first certification, the institutions are free from outside pressure. Over the years the competent authorities have never tried or considered to carry out some sort of external evaluation of MET institutions. Although almost all the institutions insist that they have been doing what they are supposed to do, the outcome is not satisfactory. The fact that each institution does things in its own way results in different outcomes and there is no periodical external auditing, it is hard to tell which institution turns out the most qualified seafarers.

4.10. Financial Problems

Although the revised STCW Convention does not specify how much a government should spend on MET institutions, a government cannot easily meet the requirements without adequate funding. The Chinese MET institutions are run by the government and funds certainly come from it. However, all the institutions have difficulty with their financial situation. With the rapid growth of the national economy, the salary of the staff keeps increasing. At the same time government’s funding in MET institutions increases at a very low rate. The funds are far from enough to maintain the running of the institutions. Take JNI for example, nearly 90% of the funds from the government in 1995 went on the staff’s salary. What is more the prices keep
going up day by day. As a result this institution could not afford new equipment and facilities. Even for the library the expenditure on purchasing new literature has been reduced again and again. Some institution leaders sigh with emotion that if the financial problem can not be solved, the implementation of the revised STCW Convention is impeded because the financial problem dominates all the other problems facing the MET institutions.
Chapter 5

Implications for Chinese MET Institutions

Since the adjournment of the diplomatic conference on the revision of the STCW'78 Convention in July 1995, the member States have been doing their best to get things ready for the implementation of the revised Convention because both time and task are pressing. The Chinese government set to work on the return of the representatives from London. As mentioned in 3.1, six working groups were set up to start the ball rolling. According to a recent report from China each group has been doing well in their specific areas. The Translation Group has already come out with the Chinese version of the revised Convention. The other groups have also done a lot, such as the Legislation Group and the Training Group.

The impacts of the revised Convention have already been strongly felt by shipping circles in China. Although the Administration, the MET institutions and the shipping companies are all being greatly challenged, the MET institutions where seafarers are turned out share the heaviest task. The introduction of quality standards has created unease for the institutions. What they should do and how they should do it well is not an easy question for them to answer.

Now the revised Convention is ready and the gap between its requirements and the current Chinese MET situation exists. What does this indicate for the MET institutions? Realizing the gap, China should take effective measures to fully
implement the Convention. Based on the comparison made in the last chapter, this chapter will put forward some personal views for the Administration and mainly for the MET institutions. Were they of some value the objective of writing this paper would be achieved and the effort of the author would not be in vain.

5.1. Reformulation of National MET Policies

Policy is the principle of action. Now that new standards are there in the revised STCW Convention, the existing national MET policies formulated according to the current Convention should be properly revised. Without uniform national policies each MET institution would still act in their own way and the quality of the graduates can not be guaranteed. Consequently the objective of the revised Convention can not be achieved.

Therefore, firstly, the current instrument ‘the New Rules on Examination and Certification for Seafarers of the P. R. China, 1987’ should be reformulated as soon as possible. These rules should be strictly in line with the requirements under the revised Convention. Together with this document the detailed examination syllabi for both deck officers and engineer officers should be revised. Since written examinations are no longer the only assessment method, other methods should be included. The qualification of assessors and the responsibility of supervisors should be specified. The certification requirements and procedures should also be stipulated. Of course the existing documents may be used for reference, but the policy makers should be careful not to be dragged away by the old regulations. In the reformulated policy control procedures regarding examination and certification must be added.

Generally the current legislation concerns very little about training but mainly about examination and certification. Therefore, secondly, a new policy governing quality standards in MET should be formulated. The policy makers must always keep quality
standards in mind and build them into the new instrument. It should be stipulated that maritime academy graduates should no longer be exempted from the national examinations for the first certificates of competency. In this way the MET institutions can no longer behave at their discretion and the competitive mechanism can be introduced into the institutions. Independent external audit should be stipulated in the document. To facilitate the enforcement, strict penalty must be imposed upon those institutions who do not live up to the standards.

Thirdly, another instrument with regard to basic safety training and special training should be worked out. ‘The Regulations Governing Special Training and Certification for Seafarers, 1984’ are no longer applicable. The new requirements set forth in the revised Convention should be taken into consideration and built into the new instrument.

Lastly, a new document regarding the re-division of specialities (departments) in the institutions should be produced by the Administration since the institutions have no power to make the decision. The institutions should be unified according to the speciality establishments so that they can turn out the same types of graduates. The new trend requires MET institutions to quit the specialities of Maritime Communication and Marine Electrical Engineering but to combine these two into Maritime Navigation and Marine Engineering Departments. The instrument should also stipulate the establishment of relevant teaching and research sections under different specialities. Ideally sections should be set up based on the ‘functions’ and below each section smaller teaching units can be formed according to different components.

5.2. The Curriculum
With the proper policies to guide their actions the next stage for the institutions is to revise the curriculum. In order to train qualified seafarers the curriculum is of great importance. Code A of the revised Convention specifies the minimum standards of competence for each level of seafarers in seven functions. In the Tables Column 1 stipulates the competence and Column 2 specifies the relevant knowledge, understanding and proficiency. These two columns should be deferred to when the whole curriculum lay-out is revised.

It is important that the following three aspects be first re-examined and reconsidered when the whole curriculum is revised, namely the target level to train for, the allocation of time for each component and the missing components required under the revised Convention.

5.2.1. To Fix A Proper Target Level

Since three levels of responsibility are distinguished in the revised Convention, the debates over the target level for Chinese higher MET institutions had been going on for some time. Some experts insisted on the management level while some others on the operational level. They all had many good reasons. According to the latest message from China, the management level has been decided upon as the target level for higher MET institutions. The author does not agree with this decision. The reason is quite simple. To aim at unrealistically high targets can only run counter to one's desire. The desire to turn out a master mariner or a chief engineer officer directly from a high school graduate without any sea service is just like the ambition for a military academy to make a general or a colonel out of a school boy. To be more realistic the target level should be fixed at an operational level. As for the training of seafarers at management level the institutions can provide some upgrading courses.
5.2.2. To Reallocate the Time

As already mentioned in 4.2., in all the Chinese MET institutions practical training consists of less than one third of the curriculum and specialized courses including specialized basic courses make up another one third (Refer to Tables 3 & 4, Section 4.2. and Appendices 4 and 5). These two major categories are squeezed and become apparently inadequate while the public courses and basic courses are over-emphasized. Therefore they should be readjusted and given more weight. The weaknesses of Chinese seafarers should be paid attention to and the relevant subjects such as maritime law and maritime English should be allocated more classroom hours. Public courses and basic courses should give way to specialized courses and practical training in particular. Competence-based training should be greatly emphasized because what the maritime industry really needs are men of action rather than theoreticians.

5.2.3. To Add Missing Components

Another aspect for re-examination is the missing components required in the revised Convention. For example, for the deck officers some components under the function of Controlling the Operation of the Ship and Care for Persons on Board at the Operational Level should be added, such as Prevention of Pollution of the Marine Environment and Anti-pollution Procedures, etc. Some of the basic safety training courses are new requirements. They should, of course, be also added in the curriculum. (This question will be further discussed in 5.5.)

5.3. Contents of Courses
The contents of courses mainly depend on the textbook. The textbook is one of the major factors influencing the quality of students. To produce good textbooks, MET institutions should take the following basic aspects into account:

5.3.1. Based on IMO Model Courses

The IMO model courses are particularly designed for the so-called specialized courses. Each textbook for the IMO model courses is written by experts in the particular field. These textbooks are constructed according to the requirements of the STCW Convention. Therefore to be in line with the international standards using textbooks of the IMO model courses is the best solution. Although new textbooks for the model courses based on the revised Convention have not come out yet, most of the existing ones can still be very well used for reference.

5.3.2. Continuous Upgrading

As mentioned earlier with the rapid development of science and technology, ship’s equipment, ship’s position fixing techniques, cargo handling techniques, etc. are also changing rapidly. The contents of courses should catch up with the latest development and the development should be embodied in textbooks. Apparently good textbooks come from continuous upgrading. It is important that the compilers or writers of textbooks should always keep an eye on the latest development in the shipping industry.

5.3.3. By Qualified Writers
Not everybody can compile or write good textbooks. The current way of producing textbooks by those in pursuance of academic title promotion should be prohibited. When deciding to establish a course the competent authorities should consider who will be responsible for the development and writing of the textbook. His academic ability and experience should be taken into account. The Academic Committee in each institution should provide guidance and consultation to the writer. Ideally all the institutions should write the textbooks jointly and use the uniform textbooks.

5.4. Practical Teaching and Training

As stated in 4.4, practical teaching and training is a weak link in Chinese MET. Knowledge acquisition is mainly through the 'cramming method' in the classroom rather than through the process of 'learning by doing'. The main cause of it is the traditional over-emphasis of the theoretical side. One of the important features of the revised Convention is that it is competence oriented. Clearly competence orientation requires more practical teaching and training apart from necessary theoretical knowledge. The shift from more theory to more practice requires Chinese MET institutions to take into account the following aspects:

5.4.1. To Attach Enough Importance to It

Generally traditional concepts are difficult to change once they are firmly rooted in people's mind. To shift from the traditional way based on knowledge to the new approach of teaching and training will undoubtedly bring about a lot of debates. However this is the general trend and popular feeling. Its importance cannot be over-emphasized. Therefore the competent authorities should stress the importance of practice and direct the MET institution leaders to take it seriously. As stated in 5.2.2. the curriculum should be readjusted and more time should be allocated to this practical link. Once the leaders treat it seriously the instructors will follow suit.
5.4.2. To Train Trainers and Raise their Status

Practical teaching and training will go nowhere without trainers. The quality of the trainers directly influences the outcome of training. Therefore first of all the trainers should be appropriately qualified. For most trainers their theoretical knowledge should be enriched and upgraded. Secondly the status of the trainers should be raised. The traditional way of thinking that trainers are inferior to teachers should be fundamentally changed. Their work should be equally valued and they should be equally treated in respect to salary and academic title promotion.

5.4.3. To Coordinate Relationship between Teachers and Trainers

As mentioned in 4.4. the separation of the teachers from the trainers impedes the real acquisition of competency. The situation that the teachers attend to the classroom teaching and the trainers take care of the hands-on performance should be improved. The teachers should go to the trainers on their own initiative and brief the trainers on their task. On the other hand the trainers should keep in touch with the teachers and swap their own views with them. By doing so both sides can also benefit from each other, which means the teachers can gain practice from the trainers and the trainers can learn theory from the teachers.

5.4.4. To Update Training Equipment and Facilities

Without necessary and up-to-date training equipment and facilities the strengthening of practical teaching and training will still be empty talk. For that reason training equipment and facilities should be updated. Of course the key to the question is money. This matter will be further dealt with in 5.8. and 5.10.
5.5. Special Training and Basic Safety Training

The revised Convention requires personnel on certain types of tankers and ro-ro passenger ships to undertake special training courses before they are assigned on board such ships. As stated in 4.5, most Chinese MET institutions do not provide these courses. However, some of them run a course for the deck officers called Maritime Chemistry which actually teaches some superficial knowledge about the characteristics of cargoes. Since no one can be sure whether a student will work on board such ships or not, the institutions should incorporate these courses into the curriculum. The current IMO Model Courses 1.01—*Oil Tanker Familiarization*, 1.02—*Advanced Training Program on Oil Tanker Operation*, 1.03—*Chemical Tanker Familiarization*, 1.04—*Advanced Training Program on Chemical Tanker Operation*, 1.05—*Liquefied Gas Tanker Familiarization* and 1.06—*Advanced Training Program on Liquefied Gas Tanker Operation* may be used for reference in the preparation of the courses. As for ro-ro passenger ships, the special training may be left to the institutions' choice because the number of ro-ro passenger ships in China is very small. If the institutions intend to provide such a course, the following areas should be covered: crowd management training, familiarization training, safety training for personnel providing direct service to passengers in passenger spaces, passenger safety, cargo safety and hull integrity training, and crisis management and human behavior training.

Basic safety training requires seafarers as part of the ship's complement with designated safety or pollution prevention duties in the operation of the ship shall, before being assigned to any shipboard duties, receive appropriate approved basic training or instruction in ‘personal survival techniques’, ‘fire prevention and fire fighting’, ‘elementary first aid’ and ‘personal safety and social responsibilities.’ The first three components have higher requirements than the current basic safety training. Nevertheless, the IMO Model Courses 1.19—*Personal Survival*, 1.20—*Basic Fire
Fighting and 1.13—Medical Emergency—Basic Training may still be of assistance in the preparation of the courses. There also exists an IMO Model Course 1.21—Human Relationships. This can also be of some assistance in the preparation of the last component. To enable the last component to be undertaken effectively Code B of the revised Convention recommends that the Administration should bear in mind the significance of communication and language skills in maintaining safety of life and property at sea and in preventing marine pollution. This requires the institutions to enhance the teaching of the IMO Standard Marine Communication Phrases. (This matter will be further addressed in 5.6.)

Being a special academy to train marine officers, the higher MET institution should also provide other areas of training in survival craft, rescue boats and fast rescue boats. The IMO Model Course 1.23—Proficiency in Survival Craft may assist in the preparation of the courses.

5.6. Staff Development and Teaching Methodologies

Staff here means the academic staff, namely the teachers. The academic staff is the most decisive factor in education and training. Qualified academic staff can produce qualified students even if the textbooks are not so good. They are in possession of profound knowledge and able to apply proper methodologies in teaching. The reputation of a famous academy depends to a great extent upon its academic staff. Therefore the academic staff should be competent. For Chinese MET institutions the following matters should be taken into consideration:

5.6.1. Well Structured Academic Staffing
Firstly the educational background of the academic staff should be improved. A higher institution teacher should be at least a master degree holder in the field he/she is engaged in. Secondly there should be an even distribution in the age structure of the staff. Ideally the age structure should be oval-shaped. The middle-aged group should consist at least of 50% of the whole. Thirdly there should be a balanced structure in their academic titles. Associate professors and full professors should comprise 50%, among which 20% are full professors and 30% associate professors. Furthermore bright young assistants and lecturers should be immediately promoted regardless of their age.

5.6.2. Continuous Upgrading

As every one knows it is never too late or too old to learn. The world is renewing itself day by day, so is the knowledge. It is even more significant for the teachers in higher education institutions to upgrade their knowledge by receiving continuous education. The forms of improving oneself can be various. They may attend relevant courses or seminars or simply study by themselves. The crux of this matter is that they should firstly realize its importance and then have a relatively long period of time at intervals. If possible in every four or five years they should be given a whole ‘free’ semester dedicated to this purpose.

It should also be pointed out that quite a number of teachers are short of practice and hands-on abilities. The dedicated semester may be used to improve such deficiencies. Onboard practice is a special means especially for MET teachers to enhance their practical knowledge. Therefore the competent authorities should create favorable conditions for them to go on board ships.

5.6.3. Feasible Teaching and Assessing Methods
It is very important that teachers have profound knowledge coupled with feasible methodology. When he/she is engaged in teaching or assessing, good methods help him/her succeed. Hence feasible methodologies should be introduced. Of course there are numerous teaching and assessing methods. The teachers and assessors should be good at evaluating them and apply those they think most suitable to their undertakings. For example, the various assessing methods spelled out in Code A of the revised Convention are appropriate to be adopted. If there is not a sound method for one particular subject, the teacher should, with the help of the Academic Committee, manage to create a suitable one in his/her case.

5.7. English Language Teaching and Learning

As analyzed in 4.7. the poor situation in English language teaching and learning in China is due to a number of problems, such as historical and cultural reasons, the education system, unrealistic teaching methods and so on. Some of the problems are hard to tackle, for example, historical and cultural reasons; but some are not so hard to be remedied. So long as proper measures are taken this hardest nut for the Chinese can be cracked.

5.7.1. English Language to Be Highly Valued

The importance of English in the maritime industry can never be over-emphasized. Being the biggest problem in MET, English should be highly valued. Ideally English should be taught from primary schools; but this relates to the whole national education system, which is not so easy to change. Nevertheless English teaching and learning should be treated preferably. More classroom hours should be added. Necessary audio-lingual and audio-video equipment and facilities should be supplemented. In fact compared with the sophisticated maritime equipment an English language laboratory costs just a little.
5.7.2. English Teachers and Teaching Methods

Firstly the language skills of the English teachers themselves should be improved. The best way is to give them an opportunity to train in language skills especially listening and speaking skills in English speaking countries. They should be encouraged to conduct the English class in English. Secondly they should study appropriate language teaching methods and select the one which most suits both the teacher and the students. Personally the author thinks that the Communicative Approach is a better approach for maritime academies. Whatever methods are applied one thing should be kept in mind is that the students should be encouraged to overcome their psychological deficiency and given more chances to practice. Lastly the number of English teachers should be increased so that the language class size can be smaller. If possible a normal class (35 to 40 students) should be divided into two groups when English is being taught.

5.7.3. English Textbooks

As stated in 4.3. the current textbooks (including English textbooks) have a lot of deficiencies, such as being out of date, mistakes, misprinting, etc. To overcome these deficiencies a great deal of work has to be done. But most importantly the competent authorities should guarantee the quality of the textbooks. For the maritime English course the IMO Standard Marine Communication Phrases are to replace the Standard Marine Navigational Vocabulary. Therefore the relevant textbooks should be revised as soon as possible to incorporate these phrases.

5.8. Training Equipment and Facilities
As already stated in 4.8., in MET institutions a lot of teaching, learning, evaluating and assessing activities depend to a certain extent on the equipment and facilities. Therefore the old and out-of-date equipment and facilities should be renewed or simply cleaned out.

5.8.1. Training Ships

First of all the decades old training ships should be replaced by modern and sophisticated ones. It is worth mentioning that ro-ro passenger ships have a great potential in China. Being a place to train marine officers the institutions had better first introduce the ro-ro passenger ship into their own fleets and, as mentioned in 5.5., the relevant courses should be incorporated in the training programs. Of course to develop ro-ro passenger shipping ro-ro terminals should also be built. (This matter is beyond the scope of this dissertation.)

5.8.2. Simulators

Simulation is a useful tool that can duplicate stressful and critical situations and sharpen the trainees’ skills to deal with such real emergencies. Simulators can safely put deck and engineer officers through crises and emergencies that they would be unlikely to experience in a lifetime at sea. Simulator-based training is also cost-effective. Simulators can be effectively used to assess competence and help to establish uniform systems of training. The mandatory types of simulation became mandatory in all the Chinese MET institutions several years ago. In this regard China has taken a further step forward compared with some other countries. However some other types of simulation recommended in Code B of the revised Convention will become mandatory some day and this day is expected to come soon. Therefore the recommended forms of simulation should be first gradually effected. They are ‘navigation and watchkeeping’, ‘ship handling and manoeuvring’, ‘cargo handling and
stowage', 'radiocommunications' and 'main and auxiliary machinery operation.'
Apart from these other types of simulators should also be developed.

5.8.3. Computers

Today 'computer' has become a household word. Its application can be found in every walk of life. The usefulness of computers is beyond description. When it is used in MET its significance may be even greater. With the increase of production computers are becoming cheaper and cheaper. MET institutions should not be grudging in purchasing computers.

With computers in hand the institutions should make the best use of them. First of all computers should be used for training, for example computer aided learning (CAL). CAL is universally recognized as an effective means of education. There are three major types, namely demonstration programs, man-machine interactive programs and imitated & intelligent programs. The first type, with a pre-determined sequence of frames, can provide the student with fundamental knowledge and operating procedures. Therefore it is particularly useful for the introduction of new maritime technology and safe processes of ship operation. The second type is especially designed for interactive training during the process of the programs. When the program is running, questions are raised and each next step is determined by the student’s answer. The third type can give some situations for the student to make a decision on each step in the process. In some software training programs the instructor can set or justify some conditions and give different situations for the student’s training on the computer. All in all computers are very useful in MET. Investment in computers is worthwhile.

5.8.4. Other Equipment and Facilities
The above three main categories of equipment and facilities are the major investment in MET institutions. However, an MET institution cannot be simply satisfied with them since it still cannot run well without other equipment and facilities. Investment should also go to the other necessary items, such as library material, visual teaching aids and those needed in the various laboratories as the existing ones are inadequate and out-of-date.

5.9. Quality Standards System

Quality standards systems have already widely been applied in the business world and increasing use is being made of them by academic institutions. The revised Convention introduces quality standards into the administration of the certification system, all training courses and programs, examinations and assessments and the qualifications and experience required of instructors and assessors, having regard to the policies, systems, controls and internal quality assurance reviews. Particularly, to ensure achievement of the defined objectives by MET institutions, each Party is obliged to carry an independent evaluation of the knowledge, understanding, skills and competence acquisition and assessment activities.

As mentioned in 4.9., to establish an effective quality standards system Chinese MET institutions are confronted with a new challenge due to some deficiencies. With the recommendations provided in Code B of the revised Convention as guidance, China should mainly take the following actions to achieve quality standards.

5.9.1. To Establish a Quality Standards Model
There is no right or wrong way of establishing a quality standards model to suit all the institutions. The only thing that matters is whether quality can be achieved. Each member State has its own national situation and therefore the model it sets up should suit its specific case. However the key elements provided in Section B-I/8 should be taken into account, namely quality policy and commitment, quality management functions, academic and administrative coverage, application of quality control functions, internal quality processes and reviews, and external quality evaluation arrangements.

Such a model may be worked out jointly by the three main institutions (DMU, SMU and JNI) under the leadership of the Administration. Persons involved should be members from each Academic Committee. In order to facilitate cooperation and coordination, it would be better, of course, if a special MET Council is first established which can exercise leadership over all the Academic Committees. The Administration may then delegate to the Council the responsibility for a suitable quality standards model.

5.9.2. To Strengthen Internal Quality Reviews

There is less guidance in Code B of the revised Convention regarding internal quality reviews than that in other matters. However it generally recommends that 'The internal quality assurance evaluations should involve a comprehensive self-study of the program, at all levels, to monitor achievement of defined objectives through the application of quality standards. These quality assurance reviews should address the planning, design, presentation and evaluation of programs as well as the teaching, learning and communication activities.'

The internal quality review is a means rather than an end. Its purpose is dual. One is to guarantee the quality and the other is to provide the basis for the independent
evaluation required under paragraph 3 of Section A-I/8 of the revised Convention. The internal quality review should not be undertaken at long intervals but continuously.

As a matter of fact the aims of all the above Sections of this Chapter are to raise the quality of Chinese MET. The areas dealt with in those Sections are the basic elements to help achieve quality standards. But to ensure achievement of the defined objectives internal review is one of the indispensable links in a quality standards system. In order to carry out this procedure successfully, first of all, the swollen administrative structure (as presented in 4.9.2.) should be cut down as 'too many cooks can only spoil the broth'. The remaining divisions (organizations) should be really competent. Secondly, the division of work should be clearly defined and necessary responsibility delegated so that everyone is fully aware of his/her task. Thirdly, the Academic Committee should really take care of academic activities including those on the students' side, qualifications of instructors, admission standards, teaching and learning activities, assessment standards, etc. Finally an overall internal quality review should be conducted as soon as possible and rectify the deficiencies found at this stage.

5.9.3. To Undergo Independent Audits from External

Without the necessary verifying mechanisms from outside, quality cannot yet be guaranteed although there are internal reviews. The purpose of the audit is to provide an independent assessment of the effectiveness of the quality standard arrangements at all levels. Paragraph 3 of Section A-I/8 requires each Party to conduct an independent evaluation of the knowledge, understanding, skills and competence acquisition and assessment activities at intervals of not more than five years. The independent evaluation should be undertaken by a team of qualified persons. This evaluation team should follow documented procedures, ensure all evaluation results
are documented, make known results to those responsible for the areas evaluated and check that timely action is taken to correct any deficiencies.

Paragraph 7 of Section B-I/8 recommends that the evaluation team should be provided with sufficient advance information to give an overview of the tasks in hand. In the case of an MET establishment, the following items are indicative of the information to be provided:

- the mission statement of the institutions;
- details of academic and training strategies in use;
- an organization chart and information on the composition of committees and advisory bodies;
- staff and student information;
- a description of training facilities and equipment;
- an outline of the policies and procedures on: student admission, the development of new courses and review of existing courses, the examination system (including appeals and resits), staff recruitment, training, development, appraisal and promotion, feedback from students and from industry, and staff involvement in research and development.

These items to be provided for evaluation are actually the hints of areas for the institution to take care of. For a Chinese MET institution in particular to attend to these areas, the personal opinions of the author given in the above Sections concerning some measures to be taken may be of some use.

Furthermore, in order to enable external audits to be carried out periodically and go onto the right path, an initial independent evaluation should be undertaken as soon as possible on the basis of the overall internal quality review mentioned in 5.9.2. At this stage a lot of deficiencies may be found; however this is not a bad thing because early remedial measures can be taken and chances of deficiency repetition can be reduced to

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a minimum. This first external evaluation cannot be done until five years later because Regulation 1/7 and Section A-I/7 urges the Governments to submit documentary evidence which include this information to IMO of compliance with the requirements of the revised Convention by August 1, 1998.

5.10. Financial Resources

As according to an American slang, ‘money talks’, without adequate finance MET institutions can hardly survive. To ensure the implementation of the revised STCW Convention, money matters first and foremost. Therefore the government should increase investment in the institutions and authorize them to look for more financial support. However where can they get more money? To solve this problem various ways of seeking financial resources should be tried.

5.10.1. Students Pay Tuition

The superiority of socialism in China is also embodied in education in terms of free tuition at all levels. However whether this remains the case is being questioned by educational institutions. Today such preferential treatment brings about many deficiencies when the government has financial problems while schools are not permitted to charge students tuition. Therefore when funds from the government cannot increase, schools should be authorized to charge tuition, at least part of it. Especially for MET institutions where expenditures are more than other educational institutions such permission should be given. By doing so the government’s financial burden can be lessened to some extent and the institution itself can strengthen its financial ability.

5.10.2. Shipping Companies Pay for Graduates
In China everything is so centralized that over many years the government has been responsible for the plans on students' admission and graduates' assignment. It is naturally regarded as reasonable that shipping companies receive graduates for free. Today it should also be regarded as reasonable for the shipping companies to contribute to MET institutions when they are making big money and on the contrary MET institutions are surviving with great difficulty. To achieve this, corresponding policies should be made by the government, e.g. how much they have to pay for one graduate.

5.10.3. To Develop School-run Industry

The government's investment in MET institutions is not adequate although Chinese MET institutions today do have their own training ships, campus workshops and a lot of other equipment and facilities. The institutions should make the limited investment yield better. On the basis of meeting the needs for training, these facilities should be used to create some economic benefits. In addition the staff should be encouraged to carry out more scientific research. The institutions should help them to have their research results turned into productive forces as soon as possible.

5.10.4. To Cooperate with Foreign Shipping Companies

Why is the Philippines able to set up around 150 MET institutions and centers nationwide (regardless of their quality)? The key to this question is that the Filipinos are good at cooperating with foreign shipping companies and ship owners' associations. In the Philippines only a few institutions are funded by the government; most of them are run on joint venture basis with foreign ship owners or entirely funded by foreigners. In order to survive Chinese MET institutions should follow suit. Under the attraction of cheaper labor force in the Far East, westerners are
shifting their eyes to this region. Therefore to seek cooperation with them is not impossible.
6.1. Conclusions

From this study the following conclusions can be drawn:

- The signature of the final act of the conference to the STCW Convention on July 7, 1995 allows less than 19 months for the Governments to take all actions necessary to give full and complete effect to the revised Convention on February 1, 1997. Time is pressing and the task is arduous.

- The STCW Convention has, to an extent, been rewritten. The amended Regulations have far reaching implications. The Code gives the details of the Convention which has been absent in the past. Even with the details provided by the Code, the Convention still provides only minimum standards. However these standards will no longer be left to the interpretation of the Administration.

- The revised Convention has great impact on the Administration, MET institutions and shipping companies. MET institutions share the most weighty task.

- Skill and competency based training is stressed in the revised Convention. STCW standards should form the core curriculum of all MET institutions and constitute the basis for evaluating and approving training provisions for trainees.

- Quality standards are brought on the scene. To guarantee the quality of seafarers MET institutions bear the brunt.
The present Chinese situation in MET is almost in line with the requirements of the existing Convention; but it still has some deficiencies.

Compared with the requirements set forth in the revised Convention, Chinese MET has many areas to improve.

To fully and effectively implement the revised Convention, Chinese Maritime Administration and especially the MET institutions have no other choice but to take the necessary measures as early as possible.

6.2. Recommendations

The implementation of the revised STCW Convention requires a great deal of hard work. Confronted with the arduous task, Chinese Maritime Administration and the MET institutions in particular should set to work as early as possible. Time and tide wait for no man. With the revised Convention as the guiding principle for their future work, the vital task for them is to consider how to adjust themselves to live up to the new requirements.

In this connection the following actions are recommended:

- The Administration should reformulate the national MET legislation according to the requirements of the revised Convention and constantly guide the institutions in the training of qualified seafarers.
- The curriculum should be thoroughly revised but before that a realistic and practical target level should be set.
- Contents of courses should be revised and constantly updated.
- MET institutions should focus their work on competence-based training.
- Special training and basic safety training should also be enhanced.
- Academic staff should be continuously upgraded to be appropriately qualified.
- The significance of improving English language teaching and learning can never be over-emphasized.
- Old and out-of-date training equipment and facilities should be abandoned while new and update ones should take their place.
- A quality standards system should be introduced.
- The government should increase investment in MET institutions. In addition other financial resources should be sought.


Appendix 1

Contents of Chapter 1 (General Provisions) of the revised annex to the STCW Convention and the STCW Code

I/1 Definitions and clarifications
Defines and clarifies key terms used throughout text.

I/2 Certificates and endorsements
Explains the format and information, including photos, to be incorporated into STCW certificates and flag state endorsements.

I/3 Principles governing near-coastal voyages
Explains conditions pertaining to different STCW standards that might apply to such voyages.

I/4 Control procedures
Outlines circumstances in which port state control inspectors may assess the operational competence of seafarers and in which ships may be detained with regard to non compliance with STCW.

I/5 National provisions
Specifies circumstances in which flag states should apply penalties to companies and seafarers not in compliance with STCW requirements.

I/6 Training and assessment
Concerns qualifications of trainers and assessors.

I/7 Communication of information
Concerns the requirement for governments to submit to IMO documentary evidence of compliance with the Convention.

I/8 National objectives and quality standards
Stipulates the incorporation, by governments, of quality standards in their training and certification regimes subject to independent evaluation.

I/9 Medical standards and the issue and registration of certificates
Concerns medical fitness, eyesight and minimum age requirements, etc.

I/10 Recognition of certificates
Clarifies flag state responsibilities concerning the competence of foreign seafarers.

I/11 Revalidation of certificates
Concerns requirements for governments to revalidate STCW certificates and to compare the qualifications of existing certificates holders with those issued certificates under the revised Convention.

I/12 Use of simulators
Contains extensive mandatory requirements and recommendatory guidance concerning performance standards for simulators.

I/13 Conduct of trials
Concerns procedures for experimentation, conducted under the authority of flag states, with new practices and technology not covered by the Convention.

I/14 Responsibilities of companies
Contains explicit requirements with which shipping companies must comply.

I/15 Transitional provisions
Concerns provisions of the revised Convention that governments are not required to implement by February 1997.

(Source: ISF)
Appendix 2

Contents of Chapters II to VIII of the revised annex to the STCW Convention and the STCW Code

Chapter II  Master and deck department
Contains precise standards of competence at different levels of responsibility, defined in detailed Competency Tables for the functions that comprise the deck department, and mandatory minimum requirements for certification.

Chapter III  Engine department
Contains precise standards of competence at different levels of responsibility, defined in detailed Competency Tables for the functions that comprise the engine department, and mandatory minimum requirements for certification.

Chapter IV  Radiocommunication and radio personnel
Contains precise standards of competence for GMDSS operators defined in detailed Competency Table.

Chapter V  Special requirements for personnel on certain types of ship
Contains special training requirements for personnel on tankers and ro-ro passenger ships.

Chapter VI  Emergency, occupational safety, medical care and survival functions
Contains minimum requirements for familiarisation in safety matters for all categories of personnel except passengers, plus basic safety training and instruction, detailed in Competency Tables, for all seafarers with designated safety and pollution prevention duties.

Contains standards of competence, detailed in Competency Tables, for personnel with special responsibilities concerning survival craft, rescue boats, fast rescue boats, medical care and fire fighting, plus the relevant certification requirements.

Chapter VII  Alternative certification
Contains conditions and principles governing alternative methods of issuing certificates that deviate from conventional divisions between the deck and engine department.

Chapter VIII  Watchkeeping provisions
Consolidates watchkeeping requirements governing the performance of deck, engine and radio watches contained in the different parts of the existing Convention, including new mandatory provisions concerning minimum rest periods for seafarers and recommendatory guidance on the prevention of drug and alcohol abuse.
Appendix 3

(COUNTRY)


The Government of..............................................................certifies
that.................................................................
has been found duly qualified in accordance with the provisions of
regulation..................................................
Of the above Convention, as amended, and has been found competent to perform the following
functions, at the levels specified, subject to any limitations indicated
until.................................
or until the date of expiry of any extension of the validity of this certificate as may be shown
overleaf:

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The lawful holder of this certificate may serve in the following capacity or capacities specified in
the applicable safe manning requirements of the Administration:

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Certificate No..............................................................issued
on.................................................................

(Official Seal)

.................................................................
Signature of duly authorized official

.................................................................
Name of duly authorized official

The original of this certificate must be kept available in accordance with regulation 1/2, paragraph 9
of the Convention while serving on a ship.

Date of birth of the holder of the certificate.................................................................

Signature of the holder of the certificate.................................................................

Photograph of the holder of the certificate

97
## Current Curriculum for Chinese Deck Officers

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