Training of seafarers within the framework of IMO conventions

Adnan Erdal

WMU
WORLD MARITIME UNIVERSITY
MALMÖ, SWEDEN

TRAINING OF SEAFARERS WITHIN
THE FRAMEWORK OF IMO CONVENTIONS

BY

ADNAN ERDAL
TURKEY

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

Master of Science

in Maritime Education and Training, (Marine Engineering)

1992
I certify that all material in this dissertation which is not my own work has been identified and that no material is included for which a degree has been previously conferred upon me.

The contents of this dissertation reflect my personal views and are not necessarily endorsed by the University.

Supervised and assessed by:

M. KIMURA
Professor
World Maritime University
Malmo, Sweden

Co-assessed by:

I. Resat OZKAN
Professor, Dr.
Istanbul Technical University
Istanbul, Turkey
"Maritime affairs must be considered as the national aspiration of all Turks. We must achieve it in a short time."

Kemal ATATÜRK

"Denizcilili Türk'ün milli Ülküsü olarak düşünmeli ve onu az zamanda başar­malıyız."

Kemal ATATÜRK
This work is dedicated to both my mother Elife and my father Yusuf ERDAL, who have the farsightedness in encouraging and providing good education to their children, and for all their tireless efforts to achieve this objective.
# LIST OF CONTENTS

<table>
<thead>
<tr>
<th>Acknowledgements</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>iii</td>
</tr>
</tbody>
</table>

## CHAPTER 1 | INTRODUCTION

1.1 BACKGROUND .................................................. 1

1.2 SAFETY AT SEA .............................................. 3

1.3 INTRODUCTION TO THE PROJECT .............................. 4

## CHAPTER 2 | ANALYSE OF TRAINING RELATED INTERNATIONAL INSTRUMENTS

2.1 THE INTERNATIONAL FRAMEWORK .................................. 6

2.1.1 INTERNATIONAL MARITIME ORGANIZATION ....................... 7

2.1.2 INTERNATIONAL LABOUR ORGANIZATION .......................... 8

2.1.3 UNITED NATIONS DEVELOPMENT PROGRAMME ..................... 9

2.1.4 WORLD MARITIME UNIVERSITY ................................ 10

2.2 STANDARDS AND CERTIFICATES .................................. 12

2.3 STCW CONVENTION .............................................. 12

2.3.1 SPECIFIC REGULATIONS ........................................ 14

2.3.2 GENERAL PROVISIONS .......................................... 14

2.3.3 DECK DEPARTMENT ............................................ 15

2.3.4 ENGINE DEPARTMENT .......................................... 16

2.3.5 RADIO DEPARTMENT ........................................... 17

## CHAPTER 3 | MARITIME EDUCATION, AND CERTIFICATE OF COMPETENCY IN TURKEY

3.1 MARITIME TRAINING AND EDUCATION IN TURKEY ................. 18

3.1.1 MERCHANT MARINE ACADEMY .................................. 19

3.1.2 SCHOOL OF MARITIME BUSINESS AND MANAGEMENT ............. 23

3.1.3 MARINE ENGINEERING FACULTY OF THE UNIVERSITY .......... 24

3.1.4 MARITIME BUSINESS DEPARTMENT OF THE ECONOMIC INSTITUTE 24
CHAPTER 4 ESTABLISHMENT OF THE TRAINING CENTRE
FACILITIES WITH REGARD TO CONVENTION REQUIREMENTS

4.1 TRAINING OF SEAFARERS..................................36
4.2 IMO TECHNICAL COOPERATION PROGRAMME..............37
4.3 MARITIME SAFETY TRAINING CENTRE
IN TURKEY...........................................38
4.3.1 OBJECTIVES........................................38
4.3.2 BACKGROUND.......................................39
4.4 TRAINING PROGRAMS FOR SEAFARERS...............40
4.4.1 OFFICERS........................................41
4.4.2 CREW............................................42
4.5 BUILDINGS AND EQUIPMENT..........................43
4.5.1 FIRE FIGHTING SECTION...........................43
4.5.2 SEA SURVIVAL SECTION..........................45
4.6 ORGANIZATION.......................................46
4.7 STAFF REQUIREMENTS.................................46

CHAPTER 5 IMPLEMENTATION OF THE TRAINING PROGRAMS

5.1 IMPLEMENTATION OF THE STCW CONVENTION REQUIREMENTS........48
5.2 COURSE SCOPE........................................49
5.3 ENTRY STANDARDS....................................49
ACKNOWLEDGEMENTS

First of all, I would like to address my sincere gratitude to the Government of Turkey for nominating me and the Carl Duisberg Gesselschaft (CDG), Germany, for sponsoring me for the two-year fellowship for Maritime Education and Training (Marine Engineering) course at World Maritime University. In particular, I would like to thank D.B. Turkish Cargo Lines for providing me with the opportunity to study this course.

I would also like to express my sincere thanks to Mr. Mehmet Cincik, Chairman of the Chamber of Marine Engineering, for his invaluable support and Mr. Erkan Dereci, Secretary-General, for his encouragement.

I am very grateful to my course Professor, Masatsugu Kimura, for his guidance, encouragement and support during these two years of study. My sincere thanks go to Commander Randall Fiebrandt, a former lecturer at WMU, and Mr. Steven Ohnstad, a resident lecturer at WMU, for their advice and their assessments during my studies.

My special thanks go to Professor, Dr. I. Resat Ozkan, Istanbul Technical University, for his co-assessorship, his guidance and comments on this dissertation.

I would like to thank the English Language Section at WMU for its contributions to my studies in English during the two years, in particular, Ms. Inger Battista for her efforts in revising my English in this text. I am very thankful to all the staff at WMU for their kindly assistance during my studies.
The purpose of this paper is to support establishing the Maritime Training Centre in Turkey, by providing curricula and syllabi for rating and cadet training to meet requirements of various stipulated maritime training standards.

The main objective for the establishment of the Maritime Training Centre is to prepare seafarers for serving in the Turkish fleet and to provide them with employment opportunities in international shipping.

Brief information on geo-political, socio-economic conditions of the country, and main maritime institutions in Turkey has been included. In addition to that, proposals are presented regarding organization and administration of the training centre:

- staff requirements,
- construction sites and buildings,
- requirements of training facilities and equipment,
- curricula and syllabi for rating and cadet training, and
- examination and certification procedures.

Finally the dissertation is completed, with the conclusion and recommendations, related to the future expansion of the training centre.
I would like to extend my gratitude to all of my friends, who have assisted me in learning about different cultures and customs through their affection and friendship during my stay in Malmo.

Special thanks and appreciation go to my parents for their unfailing love, prayers and moral support, which has always been a guiding force in my life.

Finally, my deepest thanks go to my wife, for her self-sacrificing understanding and support during my stay in Malmo, away from home.

Malmoe 92.10.07 A.E
CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Turkey is situated at the meeting point of two continents of the world. The country is located in eastern Europe and western Asia. The length of the territory is close to 1600 km, the width about 550 km, and the total area is 780,000 sq. km. Turkey is surrounded by sea about 8000 km of coast line on three sides. The Black Sea in the north, the Mediterranean Sea in the south, and the Aegean Sea in the west. The Sea of Marmara, the Dardanells and Bosphorus straits are in the northwest.

Turkey, as a seafaring country, has been at the centre of intensive maritime activities for centuries. Due to its geographic positions it is at the crossroads of three continents. Over the centuries, therefore, the Turkish coasts have been a very important navigational passageway for international sea trade between Europe and Asia, the Mediterranean and the Black Sea.

After the foundation of the Republic of the modern Turkey in 1923, maritime transport has had special importance in encouraging the transport of goods by sea as well as shipbuilding. At the beginning shipping policy concentrated mainly on cabotage transportation so that progress in international sea borne trade was relatively slow until the early 1980's.

The policy of liberalisation of foreign trade in the mid-1980's led to a vast increase in trade and subsequent expansion of the shipping sector.
As a result of support given to the shipping sector the Turkish merchant fleet expanded very rapidly in terms of both the number of ships and the tonnage which accounted for over 6 Million DWT in 1985.

In light of this historical background and experience gained, Turkey, as an almost developed country, has recently initiated policies for achieving the highest standards of maritime safety and environmental protection by giving effect to maritime education and training.

In this context, Turkey has been one of the original members of the International Maritime Organisation (IMO) since its establishment in 1958. The major important International conventions adopted by IMO dealing with safety at sea and pollution prevention from ships such as Safety of Life at Sea (SOLAS). Prevention of Pollution from Ships (MARPOL), and Standards of Training, Certification and Watchkeeping, for Seafares, 1978 (STCW) have been ratified.

The implementation of the above mentioned conventions in the sense of an internationally accepted level of course, requires well educated and trained maritime personnel.

Maritime training in Turkey, therefore, is offered in two disciplines. The Merchant Marine Academy is the principal institution responsible for education and training students for the head of the Turkish Merchant Fleet at the level of deck and engine officers. The other is the Maritime Training High-schools which provide students a four-year-training course in order to meet rating level manpower needed in the maritime sector.
Although the level of training in these institutions is quite satisfactory, Turkey, in cooperation with IMO's technical assistance programme, has established a Maritime Training Centre based in Istanbul.

It is believed that this centre, when it is fully operative will make a substantial contribution to the training of seafarers in the country as well as in the region by offering various courses stated in the STCW Convention and training facilities.

After the ratification of the STCW 78 Convention in 1989, the need for reviewing the existing examination and certification system complying with the convention requirements become a central issue.

Therefore, this study on "Training of Seafarers within the Framework of the IMO Conventions" is, among others, aimed to give a proposal on the examination and certification system to be based on upgrading officer level crew members.

1.2 SAFETY AT SEA

Safety is the state of being free from danger, or more practically, the use of methods and devices that reduce, control, or prevent accidents.

The main purpose of maritime transport is a safe and efficient transportation of goods by sea. Highly sophisticated electronic equipment is used in modern ships, to increase safety of passengers goods and ships themselves. To run such equipment highly qualified and trained seafarers are needed. Since its very inception IMO has been playing an important role in raising the standards of training of seafarers in the world.
It has developed a number of technical standards; rules and regulations pertaining to safe operation of ships and prevention of pollution of the marine environment, and adopted the STCW Convention.

IMO technical cooperation programme has helped to establish the training centre in many countries. This has been done in Turkey as well but there is a demand for further developments.

The safety of all ships operating in the marine environment is a matter of global concern. Several maritime casualties have caused great loss of human lives and enormous damage to the marine environment. Such accidents need to be prevented.

1.3 INTRODUCTION TO THE PROJECT

The study is arranged in six chapters supported by annexes. The first chapter is an introduction to the subject, the importance of it, the background of the country in terms of geographical condition, and shipping and training facilities, in particular has been mentioned.

Chapter Two talks about international instruments which regulate education and training of the seafarers. In this chapter, the major training and safety related conventions such as STCW, ILO 147, etc. have been analyzed in order to give a clear idea about existing international obligatory instruments.

In Chapter Three the current education and training facilities, and certificate of competency in Turkey are explained in detail. This includes the complete education system with its program and training facilities.
Chapter Four talks about the establishment of the Maritime Training Centre which will offer refresher courses to shipboard personnel. In this chapter, requirements for both equipment and manpower are explained.

In Chapter Five, the implementation of a maritime training program which complies with the STCW Convention requirements is discussed. This includes a syllabus and other means of training conducted at the centre.

Finally, Chapter Six is devoted to conclusion and recommendations with regard to improvement of existing education and training programs.
2.1 THE INTERNATIONAL FRAMEWORK

The world of shipping is increasingly having to operate within a voluntary framework of international codes, conventions, and other instruments, developed through the United Nations and its specialised agencies. Those in particular, related with training are the

- International Maritime Organisation (IMO);
- International Labour Organisation (ILO);
- United Nations Development program (UNDP).
- World Maritime University (WMU).

The philosophy underlying the development of this framework has been:

- Safer ships and cleaner oceans (IMO);
- Social and other related factors in the employment of seafarers (ILO);
- Multilateral technical and pre-investment cooperation (UNDP);
- Post-graduate training (WMU).

Because such an international framework has been set up voluntarily by the groups of nations forming the specialised agencies of the UN, it would be theoretically possible for a country to operate outside of it. However, since large numbers of countries are members of these agencies and with the introduction and further development of aspects such as "port state
control" unilateral action by any country is virtually impossible.

Over the past thirty-two years, IMO has been a worldwide forum for all nations who have an interest in shipping and the sea. Currently some one hundred sixty-three nations form the organisation. During this period, the influence of IMO has steadily increased through its consideration, adoption, and implementation of many measures for improving the safety of international shipping and for the prevention and control of pollution from ships.

2.1.1 INTERNATIONAL MARITIME ORGANISATION

IMO is a specialized agency of the United Nations. It was founded in 1948 and has been effective since 1958. The original name was Inter-governmental Maritime Consultative Organisation (IMCO). It is concerned with the improvement of safety at sea and the prevention of pollution from ships. IMO also deals with International aspects of liability and compensation and the facilitation of maritime traffic. Up to date 36 conventions and protocols have been developed by IMO.

The governing body of IMO is the Assembly, which consists of some 132 members and meets once every two years. Between sessions of the Assembly a Council, consisting of 32 member Governments elected by the Assembly, acts as IMO's governing body. Most of its work is carried out in a number of committee and sub-committees.
The committees of the IMO:

- Maritime Safety Committee (MSC)
- Marine Environment Protection Committee (MEPC)
- Legal Committee (LC)
- Technical Cooperation Committee (TCC)
- Facilitation Committee (FC)

The International Maritime Organisation has given the highest priority to the development of global standards for maritime training. These are incorporated in the International Convention on Standards of Training Certifications and Watchkeeping for Seafarers, 1978 and in various recommendations and resolutions of the organisation on the subject of training.

2.1.2 INTERNATIONAL LABOUR ORGANISATION

The working and living conditions on board are also very important for the safety and efficiency of the ship. Many of these matters are covered by International Labour Organisation (ILO) conventions and recommendations.

ILO Convention No. 25 of 1926 contains basic provisions on the articles of agreement for seafarers. Further provisions in this area are contained in ILO Convention No. 70 of 1946, concerning social security, and Convention 146 of 1976 concerning annual leave. The latter three Conventions are also covered by ILO Convention No. 147.

ILO was established in 1919 to bring governments, employers and trade unions together for united action in the cause of social justice and better living conditions everywhere.
The International Labour Organisation became the first specialised agency of the United Nations in 1946. ILO is an intergovernmental organisation which has 150 member states. Its meetings, committees and conferences are not only open for government delegates, but are also open to representatives of employers and workers; all of them have an equal voice.

ILO formulate international policies and programmes to help improve working and living conditions, enhance employment opportunities and promote basic human rights. It also

- carries out an extensive programme of technical co-operation to help governments in making these policies effective in practice; and
- engages in training education and research to help advance these efforts.

2.1.3 UNITED NATIONS DEVELOPMENT PROGRAMME

The United Nations Development Program (UNDP) is the world's largest channel for multilateral technical and pre-investment cooperation. It is active in more than 150 developing countries and territories. It coordinates development programs for every economic and social sector such as farming, fishing, mining, transport, communications, health, environmental protection and training and social welfare.

UNDP projects are aimed at helping developing countries to make better use of their human and natural resources, improve living standards, expand productivity, and contribute to a sustainable expansion of the world economy. They involve:
- The expansion and strengthening of educational systems from primary through university levels, and support for a full spectrum of professional, vocational and technical instruction, from work-oriented literacy training to fellowships for specialized studies abroad.

UNDP assistance is given only at the request of governments and in response to their priority needs, and it is integrated into overall national and regional plans.

2.1.4 WORLD MARITIME UNIVERSITY

The idea for the establishment of the World Maritime University (WMU) came from an awareness at the IMO that in many developing countries there was a serious shortage of highly trained specialized maritime personnel for management training and safety administration functions.

In 1981 the IMO Assembly adopted resolution A. 501 (XII) by which requested the Secretary-General of IMO to support the establishment of a global maritime university.

The World Maritime University was accordingly inaugurated in 1983 in Malmo, Sweden, and it now forms the apex of IMO's maritime training strategy. In this unique institution, senior maritime officials of developing countries undergo two-year courses leading to Master of Science degree in: General Maritime Administration, Maritime Safety Administration (Nautical and Engineering), Maritime Education and Training (Nautical and Engineering), and Technical Management of Shipping Companies. All instruction is
in English and the university has an Intensive English Training Programme for these students who are not fluent in the language. The aim of WMU which is stated in its charter are as follows:

"The World Maritime University shall be a fundamental objective of the University to provide the international maritime community, and in particular the developing countries, with a centre for high level maritime training and an effective means for the transfer of maritime technology from the developed to developing maritime nations, with a view to promoting the achievement, globally, of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships."

The university is governed by a Board of Governors who have been chosen for their pre-eminence in shipping and related areas and have also been chosen to give a wide representation to both developed and developing maritime nations.

The academic and administrative work of the University is directed by the Rector. He is assisted by the Vice Rector, eight full-time academic professors each specializing in a different field, and a number of lecturers. In addition to the full-time academic staff, the University also benefits from short term visiting professors and lecturers to cover certain specialized subjects.

A particular feature is the use made of on-the-job training; while students will spend most of their time at the University, arrangements are made for them to extend their experience by field trainings at other institutions and organizations in Europe and elsewhere.
2.2 STANDARDS AND CERTIFICATES

The basic principle of the STCW Convention is that seafarers should be properly trained, and consequently, be duly certified. In accordance with Article VI, certificates for masters, officers or ratings shall be issued to those candidates who meet the requirements for service, age, medical fitness, training, qualification and examinations specified in the annex to the convention.

This annex lays down mandatory minimum requirements for certification and outlines syllabuses to be used to examine candidates. In addition, it contains basic principles of deck and engine watchkeeping. The annex also makes provision for the continued proficiency and updating of knowledge of certified seafarers.

Certificates need to be endorsed by the issuing administration in the form set out in Regulation I/2 of the annex. In addition, a state may, for a period of two years following the entry into force of the Convention for that state, issue a certificate of service to seafarers who have satisfactorily served in the capacity concerned for an appropriate period.

2.3 STCW CONVENTION

IMO has promoted some thirty-six international conventions and other treaty instruments, codes and recommendations of various kinds, all related to merchant ships in terms of construction equipment and operation. While the promotion of acceptable standards for the construction and equipment of vessels and for their inspection, survey and certification are
important to safeguard maritime safety, they will not achieve this on themselves.

The most important element, as far as maritime safety is concerned is the human element. A ship is only as good as the people who manage it. With the continuing technological developments in shipping, the human factor has become of great importance. No matter how sophisticated the equipment on modern ships might become, the safety of ships will ultimately depend upon their crews and their professional ability.

The vessel itself is a complex technical system. There are engines and rudders, thrusters for movement and control, charts, receivers and LORAN for navigation. There are short long range radios for communication, and anti-rolling devices for stability. And there is radar to see what is and to predict what will be. For this reason seafaring today is a highly skilled profession.

Recognizing this, the IMO in 1978 adopted the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers. The convention entered into force on 28 April 1984, and Turkey ratified it on 26 May 1989. The convention lays down minimum requirements for training, qualification and sea-going service for masters, deck officers, engineer officers, radio officers and certain categories of ratings which must be met before Governments may issue certificates of competency under the conventions.
2.3.1 SPECIFIC REGULATIONS

The STCW Convention consists of seventeen Articles which set down the general obligations under the Convention. The Articles are supported by an Annex of Regulations dealing with technical aspects. This Annex form an integral part of the convention.

The minimum standards and requirements of the convention are expressed in terms of regulations and their appendices.

A total of 23 resolutions were also adopted by the conference but those are not mandatory on state parties to the convention.

It is useful to review the requirements of this important convention and related recommendations. The mandatory Regulations and their appendices are contained in six chapters.

Chapter I General Provisions
Chapter II Master-Deck Department
Chapter III Engine Department
Chapter IV Radio Watchkeeping and Maintenance
Chapter V Special requirements for tankers
Chapter VI Proficiency in survival craft

2.3.2 GENERAL PROVISIONS

Chapter I of the convention deals with legal matters in terms of definitions, content of certificates and form of endorsement, principles governing near-coastal voyage and control procedures.
The chapter on the deck department outlines basic principles to be observed in keeping a navigational watch. It is contained in eight regulations and their appendices.

**Regulations II/1** Basic principles to be observed in keeping a navigational watch.

**Regulation II/2** Mandatory minimum requirements for certification of master and chief mates of ships. 200 gross tons or more.

**Regulation II/3** Mandatory minimum requirements for certification of officers in charge of a navigational watch and masters of ships less than 200 gross tons.

**Regulation II/4** Mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 200 gross tons or more.

**Regulation II/5** Mandatory minimum requirements to ensure the continued proficiency and updating of knowledge for masters and deck officers.

**Regulation II/6** Mandatory minimum requirements for ratings forming part of navigational watch.

**Regulation II/7** Basic principles to be observed in keeping a watch in port.

**Regulation II/8** Mandatory minimum requirements for a watch in on ships carrying hazardous cargo.
DECK OFFICER TRAINING AND CERTIFICATION AS REQUIRED BY STCW CONVENTION

1. DECK OFFICER TRAINING AND CERTIFICATION

   - DECK OFFICER TRAINING AND CERTIFICATION AS REQUIRED BY STCW CONVENTION
   - OFFICER IN CHARGE OF A NAVIGATIONAL WATCH
   - MASTER
   - CHIEF MATE
   - MATE
   - SPECIAL REF. REG. 11/2.3.1
   - VESSEL'S DAMAGE CONTROL AND RECOMMENDATION SYLLABUS
   - MASTER
   - SPECIAL REF. REG. 11/2.3.2
   - VESSEL'S DAMAGE CONTROL AND RECOMMENDATION SYLLABUS
   - MASTER
   - SPECIAL REF. REG. 11/2.3.3
   - VESSEL'S DAMAGE CONTROL AND RECOMMENDATION SYLLABUS
   - MASTER
   - SPECIAL REF. REG. 11/2.3.4
   - VESSEL'S DAMAGE CONTROL AND RECOMMENDATION SYLLABUS
   - MASTER
2.3.4 ENGINE DEPARTMENT

The chapter on the engine department outlines basic principles to be observed in keeping an engineering watch. It consists of six regulation and the appendices to them.

<table>
<thead>
<tr>
<th>Regulation III/1</th>
<th>Basic principles to be observed in keeping on engineering watch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation III/2</td>
<td>Mandatory minimum requirements for certification of chief and second engineers of ships powered by main propulsion machinery of 3000 KW propulsion power or more.</td>
</tr>
<tr>
<td>Regulation III/3</td>
<td>Mandatory minimum requirements for certification chief and second engineers of ships powered by main propulsion machinery between 750 KW and 3000 KW propulsion power.</td>
</tr>
<tr>
<td>Regulation III/4</td>
<td>Mandatory minimum requirements for certification of engineers charge of watch in a traditionally manned engine room or designated duty engineers in a periodically unmanned engine room, where the propulsion power is 750 KW or more</td>
</tr>
<tr>
<td>Regulation III/5</td>
<td>Mandatory minimum requirements to ensure the continued proficiency and updating of knowledge for engineers</td>
</tr>
<tr>
<td>Regulation III/6</td>
<td>Mandatory minimum requirements for ratings forming part of an engine room watch.</td>
</tr>
</tbody>
</table>
ENGINEER OFFICER TRAINING AND CERTIFICATION
AS REQUIRED BY STCW CONVENTION

CHIEF ENGINEER

SECOND ENGINEER

REG.III/3. 5

REG.III/2.1.2.3.4
APPENDIX TO III/2

REG.III/3 1.2.3.4.5
APPENDIX TO III/3

SPECIAL REF.
REG.III/2.2D

SPECIAL REF.
REG.III/3.2D

SPECIAL REF.
REG.III/4.2H

OFFICER IN CHARGE OF AN ENGINEERING WATCH
REG.III/4. 1.2.3.4.5
RES.2 AND ITS ANNEX
RES.4 AND ITS ANNEX

VESSELS POWER OF 3000 KW OR MORE

VESSELS POWER RANGE 750 - 3000 KW

OFFICER TRAINING SHOULD BE BASED ON REG.III/1
AND OTHER RELEVANT INTERNATIONAL RECOMMENDATION
THE INO MODEL SYLLABUSES SHOULD BE USED FOR GUIDANCE
2.3.5 RADIO DEPARTMENT

The mandatory requirements for the radio department are contained in three regulations, and their appendices.

Regulation IV/1 Mandatory minimum requirements for certification of radio officers
Regulation IV/2 Mandatory minimum requirement to ensure the continued proficiency and updating of knowledge for radio officers
Regulation IV/3 Mandatory minimum requirement for certification of radio telephone operators

2.3.6 SPECIAL REQUIREMENTS FOR TANKERS

This chapter lays down mandatory minimum requirements for the training and qualifications of masters, officers and ratings of petroleum chemical and liquefied gas tankers.

2.3.7 PROFICIENCY IN SURVIVAL CRAFT

The chapter on survival craft is concerned with mandatory minimum requirements governing the issue of proficiency of certificates in survival craft.
CHAPTER 3

MARITIME EDUCATION, AND CERTIFICATE OF COMPETENCY IN TURKEY

3.1 MARITIME EDUCATION AND TRAINING IN TURKEY

Turkey started the education system for seafarers who serve in the Turkish Merchant Fleet very early. The first Turkish Marine College was established on Samas Island (Sakiz Adasi) in 1848 when shipping was undergoing a change from sail to steam.

Maritime education in Turkey has a long history coming from 1848 when the first Marine College was founded to meet requirements in qualified seafarers to run the fleet of the Empire in the epoch of revolutionary changes in ship construction development and when the first steamer came into existence.

In response to the growing number of disasters at sea in the beginning of the century stemming from lack of safety precautions and unqualified sea personnel, it was decided to establish another maritime college on the Princess Island (Heybeli Ada) for the training of marine officers.

In the process of evolution maritime education and training in Turkey was split in two levels:

1. University Level (Higher education):
Educational institutions listed below provide high level education for seafarers as well as for maritime administrators:
- Merchant Marine Academy -Istanbul.
- Dokuz Eylul University, (School of Maritime Business and Management -Izmir.)
- The engineering Faculties of several Universities of Turkey
- Istanbul University, (Maritime Business Department of Economics Institute)

2. High School Level:
It provides marine education for ratings and for candidates for university level institutions where higher education in shipping is given. They are:

- The Anatolian Maritime Technical High School
  Istanbul.
- Beykoz Shipping and Aqua Products School
  Istanbul
- Vocational High School (all over Turkey)

3.1.1 MERCHANT MARINE ACADEMY

The present school was originally founded in 1909, having a private status by Capt.Hamit Naci. Since 1939 it has been regulated by the Ministry of Transport. In 1988, after the school was designated Marine College, it has been transferred under the authorization of Istanbul Technical University (ITU).

The graduates of the school are employed on board ships as well as in the maritime administration. The duration of education and training in the school is four academic years which is split up into eight semesters of 16 weeks each. At the end of every semester, exams are held. Each year's education and training programme is divided into two parts, an academic and a practical training part.
The programme and length of practical training are different for each of the classes, to meet the requirements of the STCW Convention. According to the latest decision taken by the Academic Council, the curriculum of the College and the language of instruction will be in English after 1993.

2 ENTRANCE REQUIREMENTS

A candidate who wants to enter the Marine College must pass the following selective examinations:

1. General university entrance examination
2. Specific examination of the Academy
3. Physical and medical examinations

The general university entrance examination: Any graduates of a high school or an equivalent institution may apply to this exam. During the examination a candidate must show his proficiency in subjects common for all universities in Turkey, i.e., in Turkish, Mathematics, and social sciences to the level approved by the Ministry of Education.

Before passing a specific examination of the academy, a medical fitness certificate of the candidate should be submitted to the academy admissions board.

The specific examination of the academy is divided into two parts, an athletic fitness, and personal interview with the academic council. There will be an English exam after 1993 for preparatory classes.
.3 EDUCATION PROGRAMMES

The Marine College presently has two educational departments:

Deck Department
Engineering Department

Deck Department

The education programme of the deck department includes the required courses, such as Physics, Chemistry, Calculus, Law, Economics, Electric, Ship Construction and knowledge, Oceanography, Computer, Seamanship as well as the branch courses, such as Ship Electricity, Navigation, Meteorology, Cargo handling, Shipping Business, Maritime Transport Economics, Safety of Life at Sea (SOLAS), Collision Regulation at Sea, Maritime Communication systems, Chartering, Brokering, Medical Knowledge, Port and Shipping Managements, Ship construction, Personnel Management, etc.

Practical training for deck cadets

Practical training usually takes place at the end of the semester. Class 1, 2, and 3 students go to sea for four weeks of practical training at the end of the second semester after the examination. During the fourth year, the students serve as cadets on board a merchant vessel at least for twenty weeks depending on the ship schedule. Two weeks' practical training in dockyards takes place at the end of the third semester and the hospital training at the end of the fifth semester.
Engineering Department

The Engineering Department Education Program consists of Maintenance, Energy, Work and Motion Systems, Calculus, Physics, Chemistry, Technical Drawing, Law, Thermodynamics, mathematics, Analytic Geometry, Mechanics, computer, Naval Architecture, Heat Transfer, Diesel Engines, English, Gas and Steam Turbine, Combustion Engines, Hydrostatics and Pneumatics. The branch courses are:

- Marine electricity
- Ship Engines
- Engine Operation
- Machinery Elements
- Control Theory
- Fluid Mechanics
- Refrigeration and Air-conditioning
- Engineering Economics
- Lifting Engines
- Boilers
- Ship Auxiliary engines, etc.

Practical training for engineering cadet

First year students go to dockyard for a duration of 30 days practical training at the end of the second semester after the exam. Class 2, and 3 students go to ship for six week practical training of different types of engine at the end of the second semester. During the last year, the students serve as engineering cadets on board a merchant vessel for 23 weeks.
System of NEI in Maritime Academy
3.1.2 SCHOOL OF MARITIME BUSINESS AND MANAGEMENT (SMBM)

The School was founded in 1988 to meet the manpower needs of the maritime industry in Turkey. It is the first school of higher education in Turkey concerned with the maritime business management and technical education.

The main objective of the SMBM is to prepare students for careers in the field of maritime business management, maritime operations and engineering. The medium of instruction is English: Students are prepared to meet the demand of both national and international institutions and firms. The School provides knowledge in Administrative Sciences as well as those of Law, Architecture and Engineering.

Students are selected according to their Turkish and Mathematics grades. Students are placed either in the Freshman or Preparatory classes based upon the results of a language proficiency test which is administered by the Department of Foreign Languages of the University. The SMBM has three departments:

- a- Maritime Business Management Department
- b- Deck Department
- c- Ship Engineering Department

Maritime Business Management Department: The aim of the program is to educate and train managerial personnel for the maritime sector in the field of Ship Brokerage, Marine Agents, Chartering, Marine Insurance, and Port Administration. Marine Business Management Department started its program in the academic year of 1989-1990.
Deck Department: The program is organized to educate the students as yacht masters, home trade and ocean going deck officers and electronic communication officers.

Ship Engineering Department: The purpose of this program is to provide education for future technical personnel.

Practical Training: Practical training is provided to integrate the undergraduate courses with the practice of the maritime trade in the public and private sectors. This training is held between semesters.

3.1.3 A MARINE ENGINEERING FACULTY OF THE UNIVERSITY

The shipping industry also recruits marine engineering officers from the Marine Engineering Faculty of the University. Those engineering officers have to sit for additional exams for the required certificate conducted by the Marine College to complete examination of their knowledge and experience in the marine field. Additionally practical sea training is required. This practical sea training should be completed before the exam date.

3.1.4 MARITIME BUSINESS DEPARTMENT OF THE ECONOMICS INSTITUTE

The Maritime Business Department of the Economics Institute has a maritime business specialisation programme. It is the first post graduate education programme in the maritime field in Turkey. The programme started in 1986 with the duration of education of one academic year.
The main objective of the programme is to educate and train managerial personnel who are assumed to occupy positions of medium or high level manager to provide the qualified personnel and to improve the efficiency of Turkish maritime business throughout the world.

3.1.5 ANATOLIAN MARITIME TECHNICAL HIGH SCHOOL

The Anatolian Maritime Technical High School offers education in the areas of the maritime field, navigation, marine engineering, radio electronics, and port and shipping administration.

At this high school the educational period for graduates of secondary schools is four years. The first year of education is preparatory where only Turkish and English languages are taught. There is a three-week pre-sea training on board a merchant ship in the third year of their education.

The graduates of this school have the opportunity to attend higher education institutes. On completion of their education, some of these students may undertake a seagoing career on board the Turkish or a foreign fleet to obtain either class IV master a Harbour Tug Master's or class IV Engineer (motor) certificates.

3.1.6 SHIPPING AND AQUA PRODUCTS SCHOOL

The School was founded in 1973 in Beykoz in Istanbul. This Secondary school educates students who will take part in making better use of the resources and food industry of Turkey. The School has no entrance examination and the students whose health is fit to work at sea are accepted. The duration of study is three years. The school has got electricity, electronics, and ship engines laboratories.
System of NET in Maritime Technical High School (Deck division)
In the foundation of the school there was a contribution from Japanese specialists. Turkish managers and teachers have gone to Japan to improve their knowledge according to the agreement between the Japanese and Turkish Governments. Some special machines and equipment have been brought from Japan.

3.1.7 VOCATIONAL HIGH SCHOOLS

There are two types of vocational high schools in Turkey: Technical Vocational High Schools, and Industrial Vocational High Schools.

Technical Vocational High Schools: The aim of these high schools is to prepare students for various professions and technical fields, and to train qualified manpower in these fields. Their educational period covers 3 or 4 years. Some organisations opened vocational high schools to meet their own personnel needs. Most of the Motor Vocational High School have marine mechanics divisions.

Industrial Vocational High Schools: These institutions aim to train qualified personnel which are expected to be employed in the fields of repair, maintenance and production in industry. Offering a three-year education, they are free of payment, and have got their own dormitories. In various branches these institutions offer instruction either in various or in a single field, such as construction, motor mechanics, chemistry, metal-work or fishing.
System of NEI in Maritime Technical High School (Technical)
Students who graduate from the second level school are accepted into these schools, and the institutions concerned prepare them for higher education in the field they have chosen. Some of them serve the marine field namely Central Industrial Vocational High School in Samsun, Golcuk Industrial Vocational High School in Kocaeli.

3.2 EXISTING CERTIFICATES AND LICENSES

According to the Turkish Seafarers Certification Rules, certain conditions ought to be satisfied for the issue of seamen certificates of competency for service on the Turkish Merchant Fleet:

- To be Turkish citizen
- Not less than the age of 18
- Satisfy the initial training requirements
- Have completed the qualifying sea service
- Hold an approved and valid medical fitness certificate for sea service
- Pass the examination

To qualify for the issue of an initial certificate of competency of any class in Turkey each candidate must:

- have attended approved fire fighting, first aid at sea and survival at sea courses.

The regulations specify the following classes of certificate and licenses for Turkish seafarers.
Extract from the Turkish Seafarers Certification Rules, 6 May 1989.
3.2.1 CERTIFICATES OF COMPETENCY ON DECK DEPARTMENT

The requirements for getting the deck certificate of competency in Turkey are as follows:

1. CLASS IV MASTER (Deck Officer)

1. Three years, of which at least twelve months must have been spent in charge of a navigational watch in motor ships as an able-seaman; or
   - twelve-month sea-going service whilst holding a boatswain competency of certificate; and
   - to pass the examination

2. Completion of a deck division of a maritime technical or vocational high-school.
.2 CLASS III MASTER (Deck officer)

1. Five years, of which at least two years must have been spent in charge of a navigational watch in motor ships as an able seaman; or
   - Three-year sea-going service as a boatswain or
   - Two-year sea-going service whilst holding a class IV Master (deck officer) certificate of competency or one year sea-going service as a class IV master (deck officer); and
2. Completion of not less than four years of education in Marine vocational or vocational high school deck division.

.3 CLASS II DECK OFFICER

1. One year sea-going service as a captain whilst holding a class III master (deck officer) certificate of competency; or
   - Minimum one year sea-going service on board ship of not less than 300 GRT; or by one of the following:
2. At least two years must have been studied in Merchant Marine Academy deck division; or Naval academy, and
   - To pass the examination
3. Completion of the Merchant Marine Academy, transport and management division (this division has cancelled since 1983.)

.4 CLASS II CHIEF MATE

- Three-year ocean-going service in ships of not less than 300 GRT as a deck officer whilst holding a class II deck officer certificate of competency, and;
- To have a "certificate of proficiency" given by master

.5 CLASS I DECK OFFICER

- Completion of the Merchant Marine Academy deck division

.6 CLASS I CHIEF MATE

- Minimum three-year ocean-going service in ships not less than 500 GRT as a deck officer whilst holding a class I deck officer certificate of competency; and
- To have a "certificate of proficiency" given by master.

.7 CLASS II MASTER

1. Minimum one-year ocean-going service in ships of not less than 500 GRT whilst holding a class I deck officer certificate of competency
2. Three years of ocean-going service in ships of not less than 500 GRT as a class II deck officer; and
- to pass the examination.

.8 CLASS I MASTER

1. Completion of the Merchant Marine Academy or Naval academy; and
- three years of sea-going service in ships of not less than 500 GRT as a captain or deck officer whilst holding a class II master certificate of competency

2. Minimum four years of near coastal-sea service whilst holding a deck officer certificate of competency; and
- to pass the examination.

3.2.2 CERTIFICATES OF COMPETENCY OF ENGINE DEPARTMENT

To qualify for the issue of the engineering certificate of competency in Turkey are as follows:

.1 CLASS IV ENGINEER (MOTOR) OFFICER

1. Two years of sea-going service in motor ships as an oiler, or;
- one year sea-going service as a donkeyman, or;
- three years of experience as a locomotive mechanical, and;
- to pass the examination.

2. Completion of the vocational high school mechanical division, or;
- technical high school mechanical division.

.2 CLASS III ENGINEER (MOTOR) OFFICER

1. In steam ships with engine power of not less than 370 KW or in motor ships of not less than 185 KW engine power two years of sea going service as a donkeyman, or;
- five year as an oiler, or;
- one-year as a class IV engineer (motor), and;
- to pass the examination.

2. Completion of vocational high technical school mechanical or motor division, or; at least completion of technical school
- any others four year training in engineering such a mechanical, motor or engine-fitting division.

.3 CLASS II ENGINEER OFFICER

1. Sea-going service in motor ships of not less than 370 KW registered power whilst holding a class II engineer (motor) certificate, or ; minimum five years of sea-going service as a donkeyman and to pass the examination or one of the following:
2. To complete two year in a Merchant Marine Academy, or;
- Naval academy, and;
- Completion of the appropriate practice training, and to pass the examination.
3. Completion of any facility of technical training, mechanical or motor divisions.

.4 CLASS II SECOND ENGINEER OFFICER

1. Three years of sea-going service in motor ships of not less than 370 KW engine power whilst holding a class II engineer officer certificate of competency, and
- To have a "certificate of proficiency" given by the chief engineer.
5 CLASS I ENGINEER OFFICER

1. Completion of the Merchant Marine Academy engineering division, or
2. Higher National Diploma in Engineering for a period of not less than four years at an academy or University; and
   - must have satisfactorily completed the appropriate practical training including sea-service; and
   - to pass the examination.

6 CLASS I SECOND ENGINEER

1. Three years of ocean-going service in motor ships of not less than 370 KW engine power as a class I engineer officer; and
   - To have a "certificate of proficiency" given by the chief engineer.

7 CLASS II CHIEF ENGINEER

1. Twelve months of ocean-going service in motor ships of not less than 370 KW engine power whilst holding class I second engineer officer certificate of competency
   - To have a "certificate of proficiency" given by chief engineer.

8 CLASS I CHIEF ENGINEER

1. Completion of the Merchant Marine Academy or Naval academy; and
   - to complete three years of sea-going service
in motor ships of not less than 370 KW engine power as a class II chief engineer; or by one of the following:
- three years of ocean-going service as a class I engineer officer; or
- four years of near coastal sea service as a class I engineer officer

2. To complete other academy or university of engineering courses, and not less than three years of ocean-going service in motor ships powered by main machinery of 370 KW or more as a class II chief engineer; or
- three years of ocean-going service as a class I engineer officer; or
- four years of near coastal sea service as a class I engineer officer; and
- to pass the examination.

3.3 EXAMINATION OF SEAFARERS IN TURKEY

In Turkey, the examination of seafarers is the responsibility of the Branch Directorates of Maritime Transport General Directorate of Ministry of Transport.

The examinations are usually held in the Marine College, in Istanbul but generally conducted by an examination committee. The examination committee consists of a number of lecturers, surveyors and superintendents. Lecturers from the Marine College, superintendents from shipping companies, and surveyors from port authorities, who constitute the examination committee have got great experience in the maritime field.
The examination is co-organized by the Directorate of Transport Regional Branch and the Marine College. The Marine College mainly considers the setting of standards and the monitoring of examinations. Examinations for class I and class II certificates are held at the Marine College in Istanbul twice a year in February and September. Exams for all other licenses and certificates take place on demand at any of the five Transport Regional Branch Directorates.

There are some exceptions in terms of examination content based on the Merchant Marine Academy syllabus. The content of examination which has to be passed by an applicant for any certificate is determined taking into account his academic background.

The examination can be in written or oral in front of examiners or combined depending on the subject. Before taking an examination each candidate must:

1- have completed the qualifying sea service requirements for the class of certificate applied for and
2- hold an approved and valid medical fitness certificate for sea service.

Only those candidates who have successfully passed the above mentioned examination are granted the certificate of competency.
4.1 TRAINING OF SEAFARERS

There is almost total agreement in the marine world that the human element is an important factor in accidents. A recent UK study indicated that statistically some seventy to eighty percent of accidents are due to human error. (MER May 1991-10)

Human error has become one of the main reasons of major shipping disasters such as the EXXON VALDEZ, the HERALD of FREE ENTERPRISE, and the ADMIRAL NAKHIMOV. But what is the reason for the growing influence of human behaviour on the safety of seamanship?

With the development of technologies, the importance of adequate training of seafarers is becoming crucial. Training programmes need to be up-dated to meet the latest requirements of various international conventions. Continuity of training is essential because of rapidly and constantly changing safety standards.

All seafarers regardless of their ranks should be involved in permanent training concerning the entry level, seafarers must have at least minimum knowledge and skills to satisfy the requirements of maritime safety and environmental protection. The mariner develops "sea sense" beginning at a basic level and continuing throughout a maritime career.
Marine officers' training is of growing importance since very complex and expensive equipment on board modern ships calls for good knowledge of operation and maintenance. Lack of confidence of the marine officer stemming from his lack of training or experience very often becomes the reason for his hesitancy to use proper equipment for the prevention of various accidents.

The training of seafarers is not only a benefit for the company; it is also a national interest for the efficient Manning and management of a national merchant fleet, and perhaps for the export of manpower to open registry or foreign flag fleets. Qualified seafarers will be able to serve in any fleet of the world and will enjoy employment opportunities within international shipping.

However, in order to compete internationally, seafarers should be trained in accordance with the IMO's STCW Convention requirements.

The overview of various aspects of the practical organisation of seafarers basic safety courses in compliance with the requirements of the STCW Convention will be given in Chapter 5. The author will mainly concentrate on the improvement of crew training rather than officers.

4.2 IMO'S TECHNICAL COOPERATION PROGRAMME

In the past few decades many ships have been involved in collisions, groundings, fires or pollution. Seafarers have been injured or lost their lives in the course of duty. Oil spills have caused extensive damage to the marine environment.
To make "safer ships and cleaner oceans" personnel training from the marine officer to the ship manager and operator is required. Even ships equipped with the highly modernized automatic instruments can not be operated by unskilled personnel. Effective training can reduce operating costs and the risk of collisions and groundings. Recognizing this, many countries have established their own training centres. But in the developing countries maritime education and training is not always available.

Giving a priority to the promotion and implementation of existing international standards for maritime safety and the prevention and control of marine pollution from ships, the IMO has established the Technical Cooperation Programme.

The Technical Cooperation Programme has helped developing countries in the training of their own human resources in the maritime sector by providing experts, fellowship training, educational material and equipment. The project for establishment of the Maritime Safety Training Centre in Turkey is one of many decisions taken by IMO's Technical Cooperation Programme.

4.3 MARITIME SAFETY TRAINING CENTRE IN TURKEY (MSTC)

4.3.1 OBJECTIVES

The main purpose of the creation of a Safety Training Centre in Turkey is to provide training for seafarers in such subjects as safety at sea, personal survival, fire-fighting and first aid in accordance with the STCW Convention.
It is intended that the proposed centre should provide training for maritime personnel from both the private and government sector of the shipping industry.

The necessary preparations to establish a training centre which will implement safety training programmes are to be undertaken according to the IMO's Technical Cooperation Programme project.

The number, type and cost of equipment required for fire-fighting and survival at sea courses have been considered in the project. (See annex I for a list of equipment to be supplied under the project). However, provision and installation of the equipment for the centre depends upon the readiness of the building for the centre for which the Turkish Government is responsible.

4.3.2 BACKGROUND

The management of a ship requires team work. In overcoming the dangers of the sea the contribution of a deckboy might be as much as one of the master. Therefore, there should be available training facilities for training both officers and ratings. However, while officers were being trained in marine colleges there were no existing facilities in Turkey for training of seafarers, below the officers' rank, to the STCW Convention requirements.

The development of a national maritime training facility for ratings was vital in Turkey because of the high increase in its shipping tonnage and growing requirements of international safety standards. That is why, in October 1986, the representatives of the Ministry of Transport of Turkey, the National Shipping
The Turkish maritime authority drafted the project and signed it in June 1987. The project is conducted by D.B. Turkish Cargo Lines under the authority of the head of the training department of the Ministry of Transport. According to the project, IMO had to provide technical assistance to establishing training centre as soon as the Ministry of Transport of Turkey fulfils all obligations under the project.

Recently the Ministry of Transport has decided that the Marine College's campus at Tuzla is the most suitable location for the Maritime Safety Training Centre. The Director of the Maritime College may be appointed as the director of the MSTC. In this case, the training activities will be conducted completely in coordination with the Marine College.

The idea of the establishment of the MSTC within the Marine College is that training will be available for different ranks of seafarers and cadets of the college as well. Short term courses to up-date theoretical knowledge for graduates of the college will also be available.

4.4 TRAINING PROGRAMME FOR SEAFARERS

The suggested types of training facilities and courses to be provided by the Maritime Training Centre for both officers and crew are summarized below.
4.4.1 OFFICERS

- Pre-sea training for the new entrant as a cadet or apprentice

- Training on board ships at sea, as nautical and engineering cadet or apprentice

- Post-sea training leading to the first certificate of competency as marine officers

- Orientation courses for second engineer and chief officers

- Subsequent post-sea training leading to master and chief engineer certificate of competency.

- Training and qualification of deck officers in electronic navigational aids include ship's bridge simulators

- Training and qualification of engineer officer of simulation facilities and its application of ships include normal and emergency procedures

- Training and qualification of marine officers of ships in fire fighting

- Training and qualification of marine officers in personal survival techniques at sea

- Training and qualification of marine officers in proficiency in the use of survival craft

- Training and qualification of person in charge of medical care aboard ship
- Training and qualification of marine officers in medical first guide for use in accidents involving dangerous goods

- Training and qualification of marine officers in the use of:
  - an inert gas system,
  - a crude oil washing system, and
  - a portable emergency radio telephony

- Special courses to shipping companies' requirements

4.4.2 CREW

- Pre-sea training for the new entrant to include "personal survival techniques"

- Subsequent refresher training for crews with appropriate sea service, so as to meet the mandatory minimum requirements for a rating, as specified in the STCW Convention

- Training and qualification for crews of every kind of ships in fire fighting

- Training and qualification for ratings in basic medical care and first aid at sea

- Training and qualification for ratings in the use of the portable emergency radio telephony
4.5 BUILDINGS AND EQUIPMENT

The Government has decided that the Maritime Safety Training Centre will be established within the Marine College. It means that implementation of the courses will take place in the present site and facilities of the Marine College.

Training equipment of the centre must cover all areas of the safety subjects and must be relevant to the technology used in modern vessels. The practical training activities should be relevant to the personnel's duties and functions aboard ship. The equipment required for each course in the safety training centre is outlined separately for each course subject as in Chapter 5.

The building and area provided for the Maritime Safety Training Centre must be adequate for the particular purpose. Constructive features of major training sections with equipment recommended for them are considered below.

4.5.1 FIRE FIGHTING SECTION

Ordinary classroom facilities and an overhead projector are needed for the theoretical part of the course. When audio-visual materials, such as video programmes, slides and taped recordings are used, the appropriate equipment must be available. In addition a demonstration table measuring 3 m x 1 m would be of use. For the practical part of the course, the following structure and equipment are required:
The building can easily be constructed by placing two steel containers one on top of the other, arranged as shown in the illustration below. Each container should measure approximately 7 m x 3 m x 2 m. The different rooms should be designed as follows:

1. a cabin
2. corridor/open room
3. electric board room
4. engine room with grating floor

Every room in the building must be readily accessible from the outside as a safety precaution. In addition, there should be access between rooms 1 and 2 by manhole, between 2 and 4 by a manhole horizontally and vertically, and between 3 and 4 by a door.

The location of the area for fire fighting drills should be chosen in such a way as to avoid affecting the environment by smoke emission.
The purpose of the creation of the Sea Survival Section is to train seafarers in compliance with the sea survival requirements of the STCW Convention, with special emphasis on survival craft use.

The section should provide a highly realistic facilities for the lifesaving training exercises. The theoretical part of the course needs an ordinary class room which is equipped with the necessary facilities.

The following facilities and equipment are considered to be essential to the satisfactory practical application:

- Swimming pool where "wet drills" will be conducted. Wet drills can be conducted both in a swimming pool and in open water areas, if open water locations are available and safe.

- A modern jetty with easy access to open waters

- Open and totally enclosed lifeboats, inflatable life-rafts including davit launched types

- Single arm and twin fall gravity davit launching systems

- Well-equipped lecture rooms, maintenance area and workshops.

Additionally there should be shower facilities, a changing room and lockers for students involved in survival courses in particular.
4.6 ORGANIZATION

The suggested organization chart for the Maritime Safety Training Centre:

```
DIRECTOR OF CENTRE

DEPUTY DIRECTOR OF CENTRE

DECK DEPARTMENT
LECTURERS/INSTRUCTORS

ENGINEERING DEPARTMENT
LECTURERS/INSTRUCTORS

ADMINISTRATIVE AND MAINTENANCE PERSONNEL DEP.
SECRETARY
```

4.7 STAFF REQUIREMENTS

4.7.1 DIRECTOR OF THE CENTRE

- Higher Maritime Education Diploma
- Minimum ten-year sea going experience
- Familiar with the different IMO Conventions and Regulations
- Fully bilingual: Turkish / English
4.7.2 DEPUTY DIRECTOR OF THE CENTRE

- Higher Maritime Education Diploma
- Minimum five-year sea going experience
- Planning experience in similar institution of at least three years
- Experience in course planning
- Fully bilingual: Turkish/English

4.7.3 DECK DIVISION OFFICER

- Higher Maritime Education Diploma (Nautical)
- Minimum five-year sea going experience
- Fully bilingual: Turkish/English

4.7.4 ENGINEERING DIVISION OFFICER

- Higher Maritime Education Diploma (Engineering)
- Minimum five-year sea going experience
- Fully bilingual: Turkish/English

4.7.5 PERSONNEL DIVISION OFFICER

- Higher Education Diploma
- Minimum experience of three years as personnel manager

4.7.6 LECTURERS

- Higher Education Diploma
- Minimum experience of three years of teaching in technical institutions
- To be familiar with ships.
- Fully bilingual: Turkish/English
CHAPTER 5

IMPLEMENTATION OF THE TRAINING PROGRAMS

5.1 IMPLEMENTATION OF THE STCW CONVENTION REQUIREMENTS

The adoption of the STCW Convention has given higher priority to the education and training of seafarers. It was realised and accepted that only highly trained marine personnel is able to implement requirements of various IMO conventions stipulating pollution prevention and safety at sea standards.

To achieve successful implementation of the STCW Convention an extensive framework of educational centres should be created which would provide theoretical and practical knowledge to seamen.

IMO has given the highest priority to the human element. For that purpose IMO’s Technical Cooperation Programme has been assisting developing countries to build up their maritime educational infrastructure. Now more attention is paid to the matters relating to education and training of seafarers, thus promoting improvement of shipboard personnel qualifications.

The STCW Convention specifies that all seafarers should have experience or training in the basic safety requirements of:
- First aid and medical care
- Personal Survival
- Fire fighting
These requirements are part of the regulation for ratings, forming part of the ships navigational or engine room watch. One of the aim of my study is to propose a comprehensive training program for the Maritime Safety Training Centre. Training for basic safety courses will be conducted by the Maritime Safety Centre.

5.2 COURSE SCOPE

1. In accordance with paragraph 1 of section 17 of the IMO/ILO Document for Guidance, 1985, the First Aid course is intended for all seafarers who are to serve aboard sea-going merchant ships. The training should be provided at an early stage of a seafarer's vocational training, preferably during pre-sea training.

2. The STCW Convention recommendation as stated in its annex to resolution 19 for the need to train all prospective seafarers in personnel survival techniques is recognized.

3. Compliance with mandatory requirements under annex 1 of IMO resolution A 437 (XI) for basic and advanced fire-fighting training courses.

5.3 ENTRY STANDARDS

These courses are open to all seafarers who are to serve aboard sea-going merchant ships. These courses should preferably be given prior to their being employed on a sea-going ship. There are no particular education requirements. All trainees must be certified by a doctor to be in a good health.
5.4 OBJECTIVES

To provide all seafarers with basic understanding of the marine environment protection problems and prevention of shipboard incidents including fire.

To provide seafarers with necessary knowledge according to contingency plans in cases of emergencies.

To ensure that all seafarers are able to provide assistance in fire and abandonment emergency situations.

To provide seafarers with the knowledge and skills of survival and rescue in case of disaster.

To provide rigid and inflatable survival craft crews and team leaders with the knowledge and skills necessary to abandon and get clear of the vessel safely.

To provide the trainee with knowledge about the danger of fire on board, the general causes of fires and their prevention.

To provide the trainee with the knowledge and skills necessary to enable him to operate portable and fixed fire extinguishing systems on board vessels.

To provide the trainee with the skill and knowledge necessary to enable him to rescue disabled seamen or passenger from a smoke filled space.
5.5 FIRST MEDICAL AID AT SEA COURSE

5.5.1 COURSE OUTLINE

1. General Principles (30 min.)
2. Body Structure and Functions (60 min.)
3. Positioning of Casualty (60 min.)
4. The Unconscious Casualty (90 min.)
5. Resuscitation (120 min.)
6. Bleeding (90 min.)
7. Management of shock (60 min.)
8. Burns and Scalds, and Accidents caused by Electricity (60 min.)
9. Rescue and Transport of Casualty (90 min.)
10. Other Topics (60 min.)
11. Review and Assessment (45 min.)
## 5.5.2 FIRST MEDICAL AID AT SEA COURSE PLAN

<table>
<thead>
<tr>
<th>Period/day</th>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERIOD I</strong></td>
<td>1 General principles</td>
<td>6 Bleeding</td>
</tr>
<tr>
<td>8.30-10.00</td>
<td>2 Body structure and functions</td>
<td></td>
</tr>
<tr>
<td><strong>PERIOD II</strong></td>
<td>3 Positioning of Casualty</td>
<td>7 Management of Shock</td>
</tr>
<tr>
<td>10.15-11.45</td>
<td>4 The Unconscious Casualty</td>
<td>8 Burns and Scalds</td>
</tr>
<tr>
<td>11.45-12.45</td>
<td>Lunch Break</td>
<td></td>
</tr>
<tr>
<td><strong>Period III</strong></td>
<td>4 The Unconscious Casualty (cont.)</td>
<td>8 Burns and Scalds (cont.)</td>
</tr>
<tr>
<td>12.45-14.15</td>
<td>5 Resuscitation</td>
<td>9 Rescue and Transport</td>
</tr>
<tr>
<td><strong>Period IV</strong></td>
<td>5 Resuscitation (cont.)</td>
<td>9 Rescue and Transport (cont.)</td>
</tr>
<tr>
<td>14.30-16.00</td>
<td></td>
<td>10 Other Topics</td>
</tr>
<tr>
<td><strong>Period V</strong></td>
<td></td>
<td>11 Review and Assessment</td>
</tr>
<tr>
<td>16.15-17.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

52
1. General principles

1.1 Describes the sequence of immediate measures to be taken in cases of emergency

1.2 States the content of an emergency check list as:
   - assessment of the accident situation
   - assessment of own hazards
   - unconsciousness
   - respiratory arrest
   - cardiac arrest
   - severe bleeding
   - rescue of casualty
   - notification of emergency

2. Body structure and functions

2.1 Describes body structure in terms of:
   - skeleton
   - joints, muscles and tendons
   - major organs (brain, heart, lungs, etc.)
   - circulatory systems

2.2 States in simple words the functions of the parts forming the body structure

3. Position of casualty

3.1 Describes appropriate procedures for positioning a casualty in an emergency, in particular:
   - the recovery position
   - the resuscitation position

3.2 Demonstrates the correct procedure for positioning casualties
4. The unconscious casualty
4.1 Recognizes the signs and hazards of unconsciousness
4.2 Applies appropriate measures, including:
   - keeping air passages clear
   - positioning of an unconscious casualty
   - action in the case of respiratory or cardiac arrest
   - no food, liquid or other substances by mouth

5. Resuscitation
5.1 Recognizes the necessity of immediate resuscitation in appropriate emergency situations
5.2 Applies resuscitation procedures alone and with assistances of a further person for a minimum period of ten minutes, including:
   - control of respiration
   - function of reclined position of head
   - mouth-to-mouth respiration
   - mouth-to-nose respiration
   - cardiac arrest
5.3 In cases of cardiac arrest states the methods and limiting factors of:
   - cardiac massage
   - cardiopulmonary resuscitation (CPR)

6. Bleeding
6.1 Recognizes the hazards of bleeding
6.2 Applies appropriate basic measures to limit bleeding, in particular dealing with:
   - internal/external bleeding
   - shock (also refers to section 7)
   - application of external pad and pressure to site
   - positioning of patient
   - application and dangers of a tourniquet
7. Management of Shock
7.1 States the main factors causing shock
7.2 Recognizes the sign of shock as:
   - colour of face
   - rate and character of pulse
7.3 Applies the appropriate measures of basic shock management
7.4 States the essential measures of shock management as:
   - stopping of bleeding
   - protection from cooling
   - early intake of ample fluids if the patient is conscious
   - positioning of the patient
   - no smoking
   - no alcohol
   - no active re-warming

8. Burns and scalds, and accidents caused by electricity
8.1 Recognizes the sign of burns and scalds and of accidents caused by electric current
8.2 Applies the appropriate measures for burns and scalds:
   - cooling of the areas as quickly as possible
8.3 Applies the appropriate measures for chemical burns of eyes:
   - removal of clothes
   - rinsing of eyes with ample water
8.4 Applies the appropriate measures for accidents caused by electric current:
   - noting hazards for rescuers
   - isolation of the casualty
   - protection from collapse
   - control of vital functions
9. Rescue and transport of casualty

9.1 Applies appropriate transportation alone and with the assistance of a further person, taking into account the confined spaces and varying heights aboard ship.

9.2 Identifies and uses:
- temporary ad hoc aids for transport
- stretcher transport
- transport on chair
- transport with a triangular cloth
- transport as illustrated in IMO model course

9.3 Recognizes the hazards of transporting a patient with injury of pelvis and/or spine and demonstrates the correct procedures for the transport of such casualties.

10. Other topics

10.1 Bandaging:
- improvises bandages by means available
- uses bandaging materials in the emergency kit
- demonstrates the correct use of bandages

10.2 Enclosed spaces:
- recognizes the dangers when making entry
- states that the internal atmosphere may contain dangerous gases or lack sufficient oxygen
- takes all necessary and appropriate precautions

10.3 Infectious diseases:
- recognizes the dangers from blood and other excretions from persons suffering from infectious diseases, particularly hepatitis, and from HIV positive persons
- takes all necessary precautions for self protection when dealing with such cases
- describes the correct procedures for disposing of blood and other excretions in such cases
10.4 Personal health and hygiene:
- applies simple rules for maintaining health and personal cleanliness

11. Review and assessment

5.5.4 COURSE EQUIPMENT

Anatomy and physiology plans as follows:
1 Front view of skeleton. (70 cm x 100 cm)
1 Back view of skeleton. (70 cm x 100 cm)
1 Front main voluntary muscles. (70 cm x 100 cm)
1 Back main voluntary muscles. (70 cm x 100 cm)
1 Circulatory system. (70 cm x 100 cm)
1 Breathing system. The lungs. (70 cm x 100 cm)
1 The main nervous system. (70 cm x 100 cm)

Video cassettes as follows:
- First Aid for Life.
  Part 1. Emergency. (16 min.)
  Part 2. As I live and breathe. (17 min.)
  Part 3. Blood loss and shock. (16 min.)
  Part 4. Bones can break. (15 min.)
- Cold shock. (22 min.)

Transparencies:
- Bandages
- Carrying methods
- Splints
- Artificial breathing methods
- Fractures
- Dislocations
- Injections

Equipment:
1 piece resuscitation unit with oxygen pressure regulator and suction unit.
1 piece paramedical rescue pack.
10 sets of every type of bandage.
5.6 SURVIVAL AT SEA COURSE

5.6.1 COURSE OUTLINE

1. Introduction, Safety and Survival (45 min.)
   1.1 Safety guidance
   1.2 Principles of survival at sea
   1.3 Definitions, survival craft and appliances

2. Emergency Situations (90 min.)
   2.1 Types of emergencies
   2.2 Precautions
   2.3 Fire provisions
   2.4 Foundering
   2.5 Crew expertise
   2.6 Muster list and emergency instructions
   2.7 Crew and emergency instructions
   2.8 Extra equipment and survival
   2.9 Abandoning ship—complications

3. Evacuation (45 min.)
   3.1 Abandoning ship—last resort
   3.2 Personal preparation for abandoning ship
   3.3 Need to prevent panic
   3.4 Crew duties—launching survival craft
   3.5 Master's orders to abandon ship
   3.6 Means of survival

4. Survival Craft and Rescue Boats (135 min.)
   4.1 Lifeboats
   4.2 Liferafts
   4.3 Rescue boats
5. Personal Life-Saving Appliances (45 min.)
  5.1 Lifebuoys
  5.2 Lifejackets
  5.3 Immersion suits
  5.4 Thermal protective aids

6. Personal Life-saving Appliances Demonstrations (225 min.)
  6.1 Lifebuoys
  6.2 Life jackets
  6.3 Inflatable life jackets
  6.4 Immersion suits
  6.5 Thermal protective aids
  6.6 Personal survival without lifejacket
  6.7 Boarding survival craft

7. Survival at Sea (45 min.)
  7.1 Dangers to survivors
  7.2 Best use of survival craft facilities

8. Helicopter Assistance (90 min.)
  8.1 Communicating with the helicopter
  8.2 Evacuation from ship and survival craft
  8.3 Helicopter pick-up
  8.4 Correct use of helicopter harness

9. Emergency Radio Equipment (90 min.)
  9.1 Radiotelegraph installation for lifeboats
  9.2 Portable radio apparatus for survival craft
  9.3 Emergency Position-Indicating Radio Beacons (EPIRBS)

10. Review and Final Assessment (90 min.)
5. Personal Life-Saving Appliances (45 min.)
   5.1 Lifebuoys
   5.2 Lifejackets
   5.3 Immersion suits
   5.4 Thermal protective aids

6. Personal Life-saving Appliances Demonstrations (225 min.)
   6.1 Lifebuoys
   6.2 Life jackets
   6.3 Inflatable life jackets
   6.4 Immersion suits
   6.5 Thermal protective aids
   6.6 Personal survival without lifejacket
   6.7 Boarding survival craft

7. Survival at Sea (45 min.)
   7.1 Dangers to survivors
   7.2 Best use of survival craft facilities

8. Helicopter Assistance (90 min.)
   8.1 Communicating with the helicopter
   8.2 Evacuation from ship and survival craft
   8.3 Helicopter pick-up
   8.4 Correct use of helicopter harness

9. Emergency Radio Equipment (90 min.)
   9.1 Radiotelegraph installation for lifeboats
   9.2 Portable radio apparatus for survival craft
   9.3 Emergency Position-Indicating Radio Beacons (EPIRBs)

10. Review and Final Assessment (90 min.)
<table>
<thead>
<tr>
<th>Period/Day</th>
<th>Day I</th>
<th>Day II</th>
<th>Day III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period I</td>
<td>1 Introduction, safety and survival</td>
<td>6 Personal life saving appliances (demonstr.)</td>
<td>9 Emergency radio equipment appliances (demonstr.)</td>
</tr>
<tr>
<td>8.30-10.00</td>
<td>2 Emergency situation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Period II</td>
<td>2 Emergency situation (cont.)</td>
<td>6 Personal life saving appliances (cont.)</td>
<td>10 Review and final assessment</td>
</tr>
<tr>
<td>10.15-11.45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11.45 - 12.45 LUNCH BREAK

Period III | 4 Survival craft and rescue boats | 6 Personal life saving appliances (cont.) |
| 12.45-14.15| | |
| 7 Survival at sea |

Period IV | 4 Survival craft and rescue boats (cont.) | 8 Helicopter assistance |
| 14.30-16.00| | |
| 5 Personal life saving appliances | | |
1. Introduction, Safety and Survival

1.1 Safety guidance
- States the safety rules laid down by the chief instructor, which must be obeyed during the course (especially during practical drills).

1.2 Principles of survival at sea
- States the principles of survival at sea as:
  - regular training and drills
  - preparedness for any emergency
  - knowledge of actions to be taken:
    * when called to survival craft stations
    * when required to abandon ship
    * when in the water
    * when aboard a survival craft
  - knowledge of the main dangers to survivors

1.3 Definition Survival Craft and Appliances
- survival craft
- rescue boat
- float-free launching
- immersion suit
- inflatable appliance
- thermal protective aid
- launching appliance

2. Emergency Situations

2.1 Types of emergencies:
- collision,
- standing,
- adverse reaction of dangerous goods or hazardous,
- bulk materials,
- shifting of cargo,
- engine room explosion or fire.

2.2 Precautions
- lists the precautions which are taken against such emergencies.
2.3 Fire provisions
- describes generally to combat fire.

2.4 Foundering
- describes generally in case of foundering

2.5 Crew expertise
- explains that the effectiveness of the means provided depends on the expertise of the personnel

2.6 Muster list and emergency signals
- muster list
- emergency signals
- emergency drills

2.7 Crew and emergency instructions
- the meaning of emergency signals
- instruction on the muster list and their duties
- the location and use of life-saving equipment
- the location and use of fire-fighting equipment
- escape routes and equipment
- emergencies involving the sinking of the ship
- the means provided for survival on ship and survival craft

2.8 Extra equipment and survival
- describes extra equipment which is to be taken from the ship to the survival craft permits

2.9 Abandoning ship complications
- some of the survival craft not capable of being launched
- absence of lighting
- absence of personnel assigned to certain duties

3. Evacuation
3.1 Abandoning ship—last resort
- states that ship usually offers the best change of survival and that abandoning ship should only be undertaken if all other measures fail

3.2 Personal preparation for abandoning ship
- explains how to prepare oneself for abandoning ship
3.3 Need to prevent panic
3.4 Crew duties to passengers
3.5 Crew duties—launching survival craft
3.6 Master's orders to abandon ship comes from the master
3.7 Means of survival
   - a means of keeping afloat
   - a means of keeping warm
   - drinking water and food
   - a means of communicating with ship or rescue services

4. Survival Craft and Rescue Boats
4.1 Lifeboats
   - describes briefly the following lifeboats:
     - open
     - partially enclosed
     - self-righting partially enclosed
     - totally enclosed
     - totally enclosed with a self-contained air support system
     - fire-protected
   - states that for passenger ships the capacity of the lifeboats is generally sufficient for every person on board
   - states that for cargo ships the capacity of the lifeboats is generally twice the number of persons on board
   - describes how lifeboats are launched by:
     - davits,
     - free fall method
   - states precautions which have to be taken to ensure personal safety while launching lifeboats
   - describes the means of embarkation
4.2 Liferafts
   - describes two main types of liferafts such as inflatable and rigid
4.3 Rescue boats
- states the minimum number of rescue boats on a passenger and cargo ships
- describes the requirements which allow a lifeboat to be classed as rescue boat

5. Personal Life-saving Appliances

5.1 Lifebuoys
- describes how lifebuoys are distributed over the ship
- describes the requirements for additional equipment attached lifebuoys

5.2 Life jackets
- states the total number of life jackets provided for a passenger ship, and a cargo ship
- states that lifejacket buoyancy may be achieved by packing with buoyancy material,
  - inflating
- lists equipment on life jackets as:
  - fixed or flashing light,
  - whistle firmly secured by a cord.

5.3 Immersion
- describes an immersion suit
- states that an immersion suit should be available to every person assigned to crew the rescue boat
- states that for passenger and cargo ships with non-enclosed lifeboats at least three immersion suits shall be carried for each lifeboat

5.4 Thermal protective aids
- main purpose of a thermal protective aid
- passenger and cargo ships with non-enclosed lifeboats a thermal protective aid must be provided for persons not provided with an immersion suit
6. Personal Life-saving Appliances (Demonstrations)

6.1 Lifebuoys
- takes lifebuoy from stowage, throws it into the water and checks that the following function as intended: lifebuoy, the self-igniting lights, and
  - the self-activating smoke signals
  - the buoyant lifelines

6.2 Life jackets
- put on a non-inflatable lifejacket correctly within 1 minute, and without assistance
- jumps into the water from a height while wearing the lifejacket
- swims a short distance while wearing the lifejacket
- test the whistle on the lifejacket

6.3 Inflatable life jackets
in addition to paragraph 6.2 tests the non-automatic methods of inflation

6.4 Immersion suits
- unpacks and put on an immersion suit without assistance within 2 minutes
- while wearing immersion suit and lifejacket:
  - climbs up and down a vertical ladder at least 5 m. in length and jumps from a height of not less than 4.5 m into the water
  - swims a short distance and boards a survival craft
  - performs assigned duties during a simulated abandonment

6.5 Thermal protective aids
- unpack and put on a thermal protective aid without assistance whilst in a survival craft or rescue boat
  - removes a thermal protective aid which impedes swimming in not more than two minutes

6.6 Personal survival without a lifejacket
6.7 Boarding survival craft
- boards a liferaft from the ship and from the water
- helps others board
- demonstrates the use of equipment, including a sea anchor
- right a capsized liferaft
- demonstrates how to abandon a liferaft

7. Survival at Sea
7.1 Dangers to survivors
- heat-sun stroke, exposure to cold and hypothermia
- effects of seasickness
- failure to maintain body fluids correctly, causing dehydration, drinking sea water
- fire or oil on water, and sharks

7.2 Best use of survival craft facilities
- describes how to clear away from ship
- explains protective measures against heat stroke, sun stroke, exposure and hypothermia
- effects of seasickness, and how to combat them
- explains prudent use of fresh water and food the need to avoid dehydration
- explains measures for survival in case of fire or oil on the water
- explains means of survival in shark-infested waters
- correct use of a drogue or sea anchor to reduce drift
- lists duties of a look-out
- describes means of facilities detection by others
- lists the means of maintaining morale
- describes use and working of shark repellents
- explains means of survival if in water and in life boat or life-raft
8. Helicopter Assistances

8.1 Explains the hand and arm signal used, and how to communicate with the helicopter through a shore station if the appropriate equipment is available.

8.2 Evacuation from ship and survival craft
- explains the need to have a pick-up space on the ship which is clear of masts, rigging and other impediments
- describes the means of evacuation from lifeboats and liferafts

8.3 Helicopter pick-up
- describes methods of pick-up harness, stretcher and rescue net
- explains hand and arm signals used for safe lifting
- describes how a member of the helicopter crew can assist in pick-up
- explains the importance of obeying instruction given by helicopter pilot or deputy

8.4 Correct use of helicopter harness
- describes the harness/strop
- demonstrates the correct way to don the harness and adopt a safe posture in it

9. Emergency Radio Equipment

9.1 Radiotelegraph installation for lifeboats
- states how many of a passenger ship's lifeboats are to be fitted with a radiotelegraph
- demonstrates the use of keying devices for transmitting alarm and distress signals
- demonstrates how to recharge the battery
- demonstrates how to support the antenna at maximum practicable height
- demonstrates use of the receiver

9.2 Portable radio apparatus for survival craft
Explanation is the same as paragraph 9.1
9.3 Emergency position-indicating radio beacon (EPIRB)
- states the purpose of EPIRBs how many are provided and where they are stowed
- demonstrates how they are activated

10. Review and Final Assessment

5.6.4 COURSE EQUIPMENT

1 Plastic 30-person life boat, fully equipped in accordance with SOLAS Ch. III, part C, Section IV, Reg. 41.8 complete with gravity type davits and with compressed air powered winch.

1 Same as above equipment in addition with a radiotelegraph apparatus complying with SOLAS Ch. IV, Part C, Reg.13.

2 Engine-powered lifeboats for practicing on coxing and command. (No davits needed, but they may made of aluminium or plastic.)

1 Inflatable life-raft (may be old), fully equipped (To remain open for demonstration and for launching by the derrick.)

2 New inflatable liferafts 12 to 15 persons, new, fully equipped according to SOLAS Ch.III, Part C, Section IV, Reg. 38.5 and Reg. 39.10.

6 Spare CO₂ containers for the above rafts.

40 life jackets of any approved type in accordance with SOLAS Ch. III, Part C, Section II, Reg. 32.1

4 Inflatable life jackets of any approved type of SOLAS Ch. III, Part C, Section II, Reg. 32.2

2 Life jackets fitted a light complying with the requirements of SOLAS Ch.II Part C, Section II Reg.32.3 and Reg 21.3.2

1 Life buoy in accordance with SOLAS Ch.III, Part C, Section Reg. 7.1 and Reg. 31.1
Life buoys equipped with self-activating smoke signals according to SOLAS Ch.III, Part C, Section II Reg. 31.3 and Reg 7.1.3 Part B Section I.

Lifebuoy equipped with buoyant life line as outlined in Reg 31.4

Immersion suits of any approved type according to SOLAS Ch.II, Part C, Section II, Reg. 33

Immersion suits of any approved type according to SOLAS Ch. II, Part C, Sec.3, Reg.34

Rocket parachute flares of any approved type according to SOLAS Ch. III, Part C, Sec.3, Reg. 35

Rocket parachute flares of any approved type according to SOLAS Ch. III, Part C, Sec.3, Reg. 35

Hand flares of any approved type according to SOLAS Ch. III, Part C, Section III Reg.36

Buoyant smoke signals of any approved type according to SOLAS Ch. III, part C, Sec.3, Reg.37

Combined light/smoke marker for Demonstration.

Combined light/smoke marker for Demonstration.

Line throwing apparatus of any approved type according to the SOLAS Ch. III, Part C, Section VII Reg. 49

Set "ship to ship" or "ship to shore" evacuation system, complete.

Set helicopter rescue belt with harness.

Raincoats of various sizes.

Pairs plastic high-boots.

6 meter Jacob's ladder.

2 meter single boom crane for manoeuvring the life rafts, with a geared hand powered winch.

Electric powered winch to hoist the boats on the slip-way when repairs have to be done on them.

Shelter for storing the boats for maintenance and all the relevant necessary tools and equipment.

Portable radio-apparatus for survival craft, complying with the requirements of SOLAS Ch.III, Part B, Reg. 6.2.1.1 and Ch. IV, Part C, Reg. 14
7 Video tapes as follows:

DS2  2  This is your lifeboat  (15 min.)
DS5  106  Helicopter assistance at sea.  (29 min.)
DS14  276  Satellite lifeline  (20 min.)
DS15  279  SOLAS Chapter III
Part 1.  Preparing for abandonment  (17 min.)
Part 2.  Abandonment by lifeboat  (18 min.)
Part 3.  Abandonment by life-raft.  (23 min.)
Part 4.  Techniques for survival.  (21 min.)

5.7  BASIC FIRE FIGHTING COURSE

5.7.1  COURSE OUTLINE

1.  Introduction, Safety and Principles (45 min.)

2.  Theory of Fire (90 min.)
   2.1 Conditions for fires
   2.2 Properties of flammable materials
   2.3 Fire hazard and spread of fire
   2.4 Classification of fires and appropriate 
       extinguishing agents

3.  Fire Prevention (90 min.)
   3.1 Fire prevention principles
   3.2 Ship construction arrangements
   3.3 Safe practices

4.  Fire Detection (45 min.)
   4.1 Fire and smoke detection systems
   4.2 Automatic fire alarm
5. Fixed Fire-extinguishing Systems (135 min.)
5.1 General
5.2 Smothering effect systems: carbondioxide, foams
5.3 Inhibitory effect systems: halogenated hydrocarbons (halon) and powers
5.4 Cooling effect systems: sprinklers, pressure spray
5.5 Emergency fire pump (cargo ships)
5.5 Chemical powder applicants

6. Miscellaneous Fire-fighting Equipment (90 min.)
6.1 Fire hoses and nozzles
6.2 Mobile apparatus
6.3 Portable fire extinguishers
6.4 Fireman's outfit
6.5 Breathing apparatus
6.6 Resuscitation apparatus
6.7 Fire blankets

7. Ship Fire-fighting Organization (45 min.)
7.1 General emergency alarm
7.2 Fire control plans and muster list
7.3 Communication
7.4 Personnel safety procedures
7.5 Periodic shipboard drills
7.6 Patrol system

8. Fire-fighting Methods (90 min.)
8.1 Knowledge of fire safety arrangements
8.2 Fire alarms and first action
8.3 Fire fighting

9. Fire-fighting Drills (270 min.)
9.1 Small fires
9.2 Extensive fires
9.3 Drills in smoke-filled spaces

10. Review and Final Assessment (180 min.)
<table>
<thead>
<tr>
<th>Period/Day</th>
<th>Day I</th>
<th>Day II</th>
<th>Day III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Introduction safety and</td>
<td>5 Fixed fire extinguishing</td>
<td>9 Fire fighting-drills</td>
</tr>
<tr>
<td></td>
<td>8.30-10.00</td>
<td>principles (cont.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Theory of fire</td>
<td>6 Miscellaneous fire fighting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>equipment (cont.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.45-11.45</td>
<td>3 Fire prevention</td>
<td>7 Ship fire fighting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>organization</td>
</tr>
<tr>
<td></td>
<td>11.45 - 12.45 LUNCH BREAK</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Fire prevention (cont.)</td>
<td>8 Fire fighting methods</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 Review and final assessment</td>
</tr>
<tr>
<td></td>
<td>12.45-14.15</td>
<td>4 fire detection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Fixed fire-extinguishing</td>
<td>9 Fire fighting drills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>systems</td>
<td>10 Review and final assessment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(cont.)</td>
</tr>
</tbody>
</table>

72
5.7.3 COURSE SYLLABUS

1. Introduction, Safety and Principles
   1.1 Instructing all seafarers in the dangers of fire in ships and the ways in which fires are caused - training them, preferably before they take up employment on a sea-going ship, in the prevention and extinguishing of fires
   1.2 States the safety rules laid down by the chief instructor which must be adhered to during the course, including during the practice drills
   1.3 List the principles of survival in relation to fire as:
      - regular training and drills
      - preparedness for any fire emergency
      - knowledge of action to be taken when called to fire stations

2. Theory of Fire
   2.1 List the condition required for fire to occur as:
      - the presence of material which acts as a fuel
      - a source of ignition, e.g. chemical biological and physical
      - sketches how these three conditions can be represented as a triangle (the fire triangle)
      - sketches how to addition of "chain reaction", forming a square, represents a continuously burning fire.
   2.2 Properties of flammable materials
      - defines: flammability, ignition point, burning temperature, burning, thermal value, lower flammable limit (LFL), upper flammable limit (UFL), flammable range, flashpoint, auto-ignition
      - gives one example how static electricity can occur
      - explains reactivity, and ignition sources
2.3 Fire hazard and spread of fire
- defines: conduction, radiation, heat flow and convention currents
- states that spread of fire occurs as a result of equalization in temperature between fire and surrounding via: conduction, radiation, heat flow, and convection currents
- list examples of each method of propagation
- lists fire hazards in the engine room, including:
  - combustible liquids—fuel and lubricating oils
  - oil leaks and oil-soaked insulation
  - hot surfaces, e.g. exhaust pipes, engine parts over heating
  - defects in lagging
  - hot work, e.g. welding, cutting by oxyacetylene torch
  - auto-ignition, e.g. oil dropping on hot surface
- list hazards in galley, including: combustible liquids, e.g. cooking oil, hot fat, hot surfaces, e.g. ovens, frying pans, flues
  - defective electrical connections
- list hazards in accommodation, including combustible materials, e.g. furnishings, personal effect matches and cigarette smoking, defective electrical connections
- list hazards from cargoes, including: self-heating cargo and spontaneous combustion, oxidizing cargoes and organic peroxides, compressed flammable gas, pyrophoric cargoes, explosives
- list hazards from cigarettes including:
  - temperature of burning cigarette, which is 500°C
  - carelessness with cigarette and matches, set in fire to bedclothes, waste-paper-bin content, etc.
- lists four phases of fire developments as: ignition (incipient), developing (surface fire), absolute fire (fire in depth in solids)
- states the temperature of a normal fire and the temperature in burning metals
- states the effect of temperature rise on the of the chain reaction, i.e. fire intensity
- classification of fires and appropriate extinguishing agents

2.4 List the classification letter and appropriate extinguishing agents for fire in the following substances
- wood, paper, textiles and similar materials
- flammable liquids, electrical equipment
- flammable gases, combustible metals

3. Fire Prevention
3.1 Fire prevention principles
- describes how to use the "fire triangle" and "fire square" concepts to prevent and extinguish fires
- gives examples of how a fire can be prevented from spreading by reducing or blocking: conduction, radiation, heat flow, convection currents.

3.2 Ship construction arrangements
- lists the basic principles
- states how escape routes are protected
- describes class A, B and C divisions
- list the means for gas-freeing tanks
- describes the purpose of and the means for inerting cargo spaces
- explains briefly the fire-prevention arrangements required in cargo spaces

3.3 Safe practices
- list general safety procedures, including: no smoking in hazardous areas, ability to raise the fire alarm quickly, ability to extinguish fire by using portable extinguishers and other methods, ability to recognize fire hazards and to take the necessary steps to prevent fires
- for the engine room, list measures for reducing fire hazards, which include: ensuring insulation and lagging are kept in good condition
- eliminating oil leaks and preventing accumulation of oil, taking proper fire precautions when welding or burning is being carried out
- checking that caps and cocks for sounding pipe to oil tanks are closed
- for the galley, lists measures for reducing fire hazards, which include: keeping extraction-fan flues clean, ensuring cooking oils do not spill on top of the stove or overheat in electrical plates
- keeping electrical installations well maintained
- for the accommodation areas, lists measures for reducing fire hazards, which include: no smoking in bed, no unauthorized electrical fittings, no emptying of ashtrays into waste-paper bins without ensuring all cigarettes ends are extinguished
- for cargo spaces, lists measures for reducing fire hazards, which include: ensuring hatches are correctly cleaned, ensuring cargo is stowed and ventilated in accordance with the rules
- prohibition of smoking during cargo-working period
- securing of cargo, and inerting the atmosphere in cargo compartments when required

4. Fire Detection

4.1 Fire and smoke detection systems
- describes the construction of an automatic fire-detection system
- states the main types of automatic fire detectors
- describes the characteristics of each main type of smoke or fire detector
- lists the alarms or actions which may be activated by a detector
- states the benefit of an automatic sprinkler system in regard to fire detection in passenger and crew accommodation
- states which detection system pertains to: cargo spaces engine room and other machinery spaced accommodation, bridge and other control rooms
4.2 Automatic fire alarm
- describes the operation of an automatic fire alarm
- describes a system which has fire zones and states where such a system may be installed in a ship
- describes the benefits of a zoned system

5. General
5.1 Lists the general requirements for a fixed system, including the following:
- the medium used must not produce toxic gases, the quantity of the medium must be adequate for, the spaces which are to be protected the piping system must have control valves
- the release of a gas medium must not be automatic
- in order to release the medium must be given by the captain or a senior officer
- lists typical fixed systems as: carbon dioxide, halogenated hydrocarbon (halon), sprinkler, foam (low expansion), foam (high expansion)
- fire mains, hydrants, international shore connection, fire and bilge pumps
- pressure water spray in special category spaces
- chemical powder applicants
5.2 Smothering effect systems: carbon dioxide and foams
- explains how CO₂ smother a fire, and its dangers
- states the action to be taken when the CO₂ alarm sounds, and in which spaces CO₂ is used
- explains the action of foam on a fire
- describes the action to be taken before CO₂ or foam are released into the fire zone
- describes the different types of foam

77
5.3 Inhibitory effect system: halon and powders
- explains that halon works by preventing the gases from reacting with oxygen in the air, thus breaking the chain reaction
- states the dangers of halon, and the actions to be taken when the halon alarm sounds
- lists the spaces in which the halon alarm sounds
- describes the actions to be taken before halon is released into the fire zone
- states on which types of fire powders are used

5.4 Cooling effect systems: sprinklers, pressure spray
- explains how a sprinkler system works
- states in which spaces the sprinkler system is used
- defines the special category spaces in which manually operated pressure water spray systems are normally used
- states the requirements for the number and position of hydrant, and the reason for fitting a shut-off valve to serve each hose
- states the reason for fitting isolating valves on the fire main
- describes an international shore connection, giving the principles dimension, and states its purpose
- describes how it is connected
- states the minimum number of these connection which must be carried

5.5 Emergency fire pump (cargo ship)
- states the number of acceptable jets of water which the emergency fire pump must be capable of supplying
- states the requirements for the location of this pump
- states the circumstances under which the emergency fire pump is used
5.6 Chemical powder applicants
- describes a typical fixed powder apparatus with each container holding 250 kg of powder
- explains how this equipment is used for best result

6. Miscellaneous Fire-fighting Equipment
6.1 Fire hoses and nozzles
- states briefly regulations concerning fire hoses and nozzles, explains how hoses are joined together and connected to fire hydrants
- explains how a nozzle can be adjusted to produce a concentrated jet, a spray or a mist, and for which purpose each is used
- explains correct maintenance and storage of hoses and nozzles

6.2 Mobile apparatus
- lists the types of mobile apparatus available, including: carbon dioxide cylinders, powder containers with propellant gas, and foam-making equipment

6.3 Portable fire extinguishers
- lists the different types of portable extinguishers as: water, foam, powder, carbon dioxide, halon
- describes the operational principles of each type of extinguishers
- states for which class of fire each type of portable extinguisher, and normal capacity of each type of portable extinguisher
- explains the procedures for having empty extinguishers recharged
- describes a portable foam applicator and how it is connected to the fire main
- states the normal capacity of such an applicator
6.4 Fireman's outfit
- list the constituents of a fireman's outfit in three sections as: personal equipment, breathing apparatus, fireproof lifeline with snaphook and harness
- list the two main types of breathing apparatus which may be used, their advantages and disadvantages
- states the requirements for the lifeline
- states the minimum number of fireman's outfits which must be carried on all ships

6.5 Breathing apparatus
- describes a self-contained Compressed Air Operated Breathing Apparatus (CABA)
- demonstrates how to dismantle and reassemble a CABA
- describes and demonstrates how to service a CABA
- demonstrates the correct way to fit the face mask of a CABA and to check that it is airtight
- lists the checks which must be made on a CABA before it is used and after it has been strapped on
- demonstrates the correct breathing technique to give a low air consumption for a particular exertion when using a CABA
- explains "dead volume" and its effect on air consumption in the CABA, what are the reasons for not remaining in a toxic atmosphere until the CABA air bottles are empty
- explains the action which must be taken when the warning signal is given on a CABA that air pressure is low. Describes a breathing apparatus having a smoke helmet, air pump, air line and fittings
6.6 Resuscitation apparatus
- describes this apparatus, and demonstrates how it is used to revive a person affected by smoke
- explains how it is used of this equipment may reduce the CABA wearer's endurance time in a smoke-filled space
- demonstrates knowledge of other resuscitation method

6.7 Fire blankets
- describes a fire blanket
- demonstrates how to use it
- states where fire blankets are normally located

7. Ship Fire-fighting Organization
7.1 Describes this signal as consisting of seven or more short blasts followed by one long blast on the ship's whistle and bells or klaxons or equivalent sounding elsewhere in the ship
- describes the purpose of the special alarm operated from the navigating to summon the crew to fire stations
- lists other possible fire alarms as including: CO2 halon, pump-room, manually operated UMS fire-detection system

7.2 Fire control plans and muster list
- describes the fire control plans and where they are located, describes the muster list
- gives example of the duties of individual crew members

7.3 Communications
- describes the methods of communication used during a fire emergency as: messengers, telephones, walkie-talkies, ship-to-shore VHF, public address system
7.4 Personnel safety procedures
- describes how a fire-fighting team is made up and
- states who is charge
- states that the fire zone may not be entered
  unless orders to do so have been given by the
  person in charge
- states the need to be familiar with the area of
  the fire zone and with escape routes
- states the need to be properly equipped to enter
  the fire zone, especially if the lights have
  failed and the space is full of smoke
- states how one should be dressed
- lists what equipment is required, including:
  breathing apparatus, hand lantern, axe, fireproof
  lifeline with fittings
- explains the use of the lifeline for signalling
- states the need to be flexible in filling
  vacancies in the necessary fire parties

7.5 Periodic shipboard drills
- states the purpose of these drills
- describes typical exercises for use during fire
  drills as including: extinguishing a fire in a
  deep fryer, entering a closed room on fire,
  extinguishing a major deck fire, and rescuing an
  unconscious person from a smoke-filled space

7.6 Patrol systems
- states that on ships having more than 36
  passengers an efficient patrol system must be
  maintained
- lists the duties of the patrol

8. Fire-fighting Methods
8.1 Knowledge of fire safety arrangements
- states the location and use of fire alarms, the
  location and use of emergency controls
- states the necessity of knowing how fire-fighting
  equipment works
- states the necessity of being aware of potential fire hazards

8.2 Fire alarms and first actions
states as actions discovering a fire: activate the alarm if possible, remove the cause of the fire
- if possible, restrict ventilation

8.3 Fire fighting
- explains the factors to be considered in deciding on fire-fighting methods:
  - accessibility of the location of the fire,
  - personnel present at the location of the fire,
  - reactions with the cargo
  - equipment and fire-fighting agents appropriate to the fire
- explains the reasons for a refresh watch

9. Fire-fighting Drills
9.1 Small fires
- demonstrates the correct use of portable fire extinguishers suited, respectively, for the following types of fire:
  - materials, e.g. wood, oil, fat, plastics
  - propane
  - electrical
- demonstrates how to extinguish fires using a hose with water jet and spray nozzle and with foam applicator

9.2 Extensive fires
- demonstrates the extinguishing of extensive fires of various type, including an oil fire, using as appropriate: water (jet, spray and fog application) foams, including Aqueous-Film-Forming type (AFF), powder, dry and wet, CO₂, halon
- using a lifeline but without breathing apparatus, demonstrates entering and passing through a compartment into which high expansion foam has been injected
9.3 Drills in smoke-filled spaces
- demonstrates how to check and use the following breathing apparatus:
- smoke helmet type with air pump and hose,
- compressed-air-operated breathing apparatus (CABA)
- demonstrates entering a small room using CABA when the room is filled with non-toxic artificial smoke
- demonstrates the use of life line as a signal line in a smoke-filled space, while wearing CABA
- demonstrates how to search for persons (using dummies) in a smoke-filled space, while wearing CABA
- takes part in team exercises communicating with other team members while wearing CABA in a smoke-filled space
- demonstrates the use of various types of portable fire extinguishers on fires in a smoke-filled space while wearing CABA
- demonstrates extinguishing an extensive fire when wearing CABA in smoke-filled enclosed spaces, including an accommodation room or simulated engine room, and using as appropriate: water (jet, spray or fog), foam, powder

10. Review and Final Assessment
5.7.4 COURSE EQUIPMENT

1 Fire and smoke building complex. The fire building, if there is no existing facilities that can be constructed easily as described in the Chapter 4 and should be equipped with the following:

3 Old latches in the simulated engine room.

4 Double navy-styled metal beds for the simulated accommodation.

5 Adult dummies (50 kg).

2 Child dummies (20 kg).

2 Separate fire hydrant outlines, one of open water supply, and other from a diesel powered fire pump.

3 Sets of Emergency escape hoods, made from flameretardant anti-static synthetic material with disposable oxygen cartridge, flow regulator and CO2 scrubber.

1 Set compressor unit with air-water-dust filter, manometer, pressure guard regulator with manual and auto control, over pressure guard and valve. Capacity at least 4 tanks per hour.

20 Distress signal units.

6 Pieces fire hoses of 20 meters each. Diam: 45 mm

10 Pieces fire hoses of 20 meters each. Diam: 65 mm

6 Pieces nozzles: 2 standard, 2 diffuser, 2jet/spray

2 Sets nozzles: 1 three positioned with handle, 1 three positioned turnable, 1 foam producing nozzle

1 Pieces international sea-shore connection.

20 Pieces fireman's outfit according to SOLAS Ch. II Part I, Reg.17

40 Sets protective clothing including tunics, fire boots gloves, overalls, helmets made of flame retarding material.

5 Electric safety lamps (hand lantern)

2 Axes
5 25 meter fire-proof lifeline with hooks and
harness.
1 Pieces breathing apparatus with 20 meters, 12 mm.
long pipe and relative air pump with smoke helmet
and bellows.
1 Pieces emergency diesel powered fire pump,
supplying at least 1200 litres per minute.
2 Pieces steel pools (1.5 meter in diameter) for
fuel fire fighting practice.
1 Pieces as above (2.5 meter in diameter)
10 Pieces shovels.
1 Set resuscitation unit with oxygen and suction for
demonstration and
1 Set more for safety purposes.
1 Set alarm whistle for demonstration and safety
purposes.
1 Set Rescue pac. for demonstration and safety
purposes.
1 Kit first aid.
2 Mechanical foam branches.
1 Pieces high or medium expansion foam generator.
1 Pieces foam compound.
2 Sets stand-pipes, keys and bars to operate hydrant
supply.
12 Pieces 9 litres water fire-extinguishers.
12 Pieces 9 litres foam fire-extinguishers.
2 Pieces fire blankets.
12 Pieces 10 kg dry powder fire-extinguishers.
36 Meters safety line and
6 Pairs snaphooks.
20 Sets breathing apparatuses as follows:
1 x 6 litres cylinder with pressure reducer and
demand regulator. 30 bar charging pressure,
complete with carrying frame and harness.
20 Sets "face piece " face masks of any approved type
with the assurance of a slight positive pressure
which prevents the ingress of contaminants into
Concrete platform for the purpose of fighting large class A fires. The name "triedron" has been given to this concrete construction. This will be constructed on the NE far end of the field. This platform simulates an open air fire-fighting or a fire into an open hold. Wood, paper, clothes and rubber will be burned and the fire will be attacked with the appropriate agent. The special shape of this platform helps the fire prow quickly as the smoke is driven away and the wind, which blows from a NE direction, will raise the flames high very fast. On the other hand, the heat will be radiated to the direction from which the firemen will be attacking forcing them to use the equipment equivalent to water spray protection.

Pieces video cassettes or films as follows:

- Use of compressed air breathing apparatus (CABA) (50 min.)
- Fire-fighting at sea. (30 min.)
- Fire chemistry. (16 min.)
- Flammable liquids - be aware. (20 min.)
- Electricity. The hidden heat. (20 min.)
- In the event of fire. (15 min.)
- Last thing at night. (15 min.)
- Fire prevention. (20 min.)
- Basic fire-fighting. (25 min.)
- Command and control. I and II. (50 min.)
- Understanding fire. (20 min.)
- ARSON alert. (20 min.)
- Fire below. (25 min.)
- The uninvited guest. (25 min.)

Pieces of an assortment of hand-held fire extinguishers, cut-aways for demonstration and assorted fire hoses, cut-away for clarity.
5.8 TANKER FAMILIARISATION COURSE

There are special requirements for seafarers who serve on board a tanker to be trained in special procedures for safety work.

This course is intended for officers and key ratings who have not previously served on board an oil tanker as part of the regular complement and covers the mandatory minimum training requirements prescribed by Regulation V/1 of the STCW Convention. It includes basic safety and pollution prevention precautions and procedures.

5.8.1 COURSE OUTLINE

1. The Oil Tanker (120 min.)
   1.1 Introduction
   1.2 Oil tanker types
   1.3 Tanker terminology

2. Petroleum Properties and Hazards (240 min.)
   2.1 The hydrocarbon structure
   2.2 Physical properties
   2.3 Hazards from petroleum cargo

3. Oil Cargo Containment Handling (360 min.)
   3.1 Tank arrangements
   3.2 Piping arrangements
   3.3 Pump types
   3.4 Pump characteristics
   3.5 Draining and stripping
   3.6 Measurement of cargo level
   3.7 Cargo heating
4. Oil Tanker Operations (360 min.)
   4.1 Loading
   4.2 Loaded voyage
   4.3 Discharging
   4.4 Ballast voyage
   4.5 Tank cleaning
   4.6 Crude oil washing
   4.7 Use of inert gas
   4.8 Purging and gas-freeing
   4.9 Tank cleaning and gas-freeing for repairs

5. Marine Pollution (150 min.)
   5.1 Causes of marine pollution
   5.3 Prevention of marine pollution

6. Safety (390 min.)
   6.1 Precautions for protection of personnel and ship
   6.2 Fire-fighting
   6.3 Safety equipment and its use
   6.4 Emergency measures

7. Review and Assessment (180 min.)
<table>
<thead>
<tr>
<th>Course</th>
<th>Period I</th>
<th>Period II</th>
<th>Period III</th>
<th>Period IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.30-10.00</td>
<td>10.45-11.45</td>
<td>12.45-14.15</td>
<td>14.30-16.00</td>
</tr>
</tbody>
</table>

**DAY I**

1. **The oil tanker**
   - 1.1 Introduction and hazards (cont.)
   - 1.2 Tanker types
   - 1.3 Tanker terms

2. **Petroleum prop.**
   - 2.1 Hydrocarbon str.

3. **Physical prop.**
   - 2.3 Hazards from

**DAY II**

3. **Oil cargo cont.**
   - 3.2 Piping arrange.
   - 3.1 Tank arrangements

4. **Pumping types**
   - 3.3 Piping arrange.

**DAY III**

5. **Oil tanker oper.**
   - 4.3 Discharging
   - 4.1 Loading (cont.)

6. **Discharging**
   - 4.4 Ballast voyage
   - 4.5 Tank cleaning

**DAY IV**

5. **Marine pollution**
   - 5.2 Prevention

6. **Safety**
   - 6.1 Precaution (cont.)

7. **Review and final assessment**

**DAY V**

6. **Safety equip.**
   - 6.3 Safety equipment (cont.)

7. **Review and final assessment**
5.9 COURSE ADMINISTRATION

5.9.1 NUMBER OF STUDENTS

Basic safety courses are open to prospective seafarers. But the number of trainees should not exceed 24 and, subject to adequate supervision, the practical training should be undertaken in small groups.

5.9.2 STAFF REQUIREMENTS

All training and instruction should be given by properly qualified personnel. The senior instructor should have experience as a master or chief engineer, depending on the subject. All assistant instructors should have a practical knowledge of basic safety courses, and should be familiar with ships.

5.9.3 TEACHING FACILITIES AND EQUIPMENT

Ordinary classroom facilities and an overhead projector are needed for the theoretical part of the course. The classroom should be designed to accommodate at least twenty-four students, and equipped with sliding black-boards and a projection screen. When audio-visual materials, such as video programmes, slides and taped recordings are used, the appropriate equipment must be available.

The equipment required for the practical part of the course in the safety training centre is outlined under each subject.
5.9.4 SAFETY ROUTINES

Safety precautions during drills are a major component in the organisation of those courses. Course trainees must be protected from danger at all times while the course is in progress. Instructors and their assistants must supervise strictly and act as safety guards. The staff can assist trainees when required. Other safety precautions include portable fire extinguishers, first aid equipment and an oxygen unit and furthermore resuscitation kit must be ready.

5.9.5 EXAMINATION

The evaluation must be based on clearly defined objectives, and it must truly represent what is to be measured. There must be a reasonable balance between the subject topics involved and also in the testing of trainees KNOWLEDGE, COMPREHENSION and APPLICATION of concepts, with emphasis on practical studies.

The methods chosen to carry out an evaluation will depend upon the course content. During the theoretical and practical lectures, the instructor will give assessments, each of which will result in a mark for the trainee.

5.9.6 CERTIFICATION

Provided basic safety courses have been approved by the Administration, a training program of each safety subject and a certificate will be issued to him after having passed all assessments and final examinations. A certificate should specify type of course and related International Regulations. The certificates should be translated into English.
CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

As shipping is a specific industry in which great potential risks of harm to the marine environment and safety of life and transportation at sea is involved, education and training of seafarers acquires special importance.

A review of the latest safety reports shows that the condition of seafarers is inter alia the main reason of ship disasters. The achievement of the adequate ability merchant marine personnel, which consists of the practical applicability of the knowledge and the proper mental attitude of the seafarer would meet the expectations of the safe operation of ships.

The application of new technologies in the marine field calls for higher degrees of knowledge, skills and attitudes from shipboard personnel. It is therefore, essential for ships officers and engineers to be familiar with ship structure, systems, stability matters and ship operations.

Over the past two decades the world maritime structure has changed. Ships are today generally larger and faster and carry a greater variety of cargoes, some of which pose health hazards and are associated with the risk of fire, explosion and pollution of the marine environment. The seas are more crowded today and the risk of collision and grounding have increased.
Accidents are features of many industries and the shipping industry is no exception. Seafarers have been injured or have lost their lives in the course of duty. Ships have foundered in heavy weather or have been lost through structural failure, collision, grounding, cargo shifting or coming into contact with fixed or floating objects. Fire has caused the loss of life and property and oil spills have caused extensive damage to the marine environment.

There is a growing number of shipping and shipboard accidents occurring each year. Although the way to decrease the casualty rate is very complex, it is however obvious that the "human error" still plays a major role in shipping casualties and accidents.

The International Maritime Organisation have in the past thirty years developed technical standards, rules, regulations and codes of practice to ensure the safe and efficient operation of different types of ships and the prevention of marine pollution. Among these the most important is the STCW Convention accepted by parties representing 86% of the world merchant shipping tonnage. The STCW Convention has brought an improvement in the safety of the shipping world by raising the standards of training.

It has been proved that the principal key to the improvements of maritime and environmental safety lies in enhancing the education and training of all personnel involved in international shipping.

Those countries which have already accepted and ratified the STCW Convention and managed to implement its stipulations bringing syllabi of their marine academies in compliance with it are remarkable advanced in raising safety standards.
The main purpose of seafaring is safe transportation of passenger and cargoes to a destination. Modern ships, even if only equipped to the minimum standards of IMO conventions, are quite complex. Therefore, in order to operate ships safely and efficiently well trained and properly motivated seafarers are needed.

By well qualified seamen is meant the relevant education and training received by both officers and unlicensed personnel. This will make them more useful citizens, to the nation, even if they leave their sea career. For unlicensed personnel this may mean that they learn welding or using machines, as well as watch-keeping procedures and maritime safety.

Ship related government and international regulations are in continuous development, particularly in regards to pollution prevention and safety. Pollution has to be of great concern not only to the public and government but also to ship owners and operators. Properly trained ship personnel would be able to understand grave consequences of pollution and undertake deliberate and effective measures to prevent or minimise it.

The introduction of new technology in shipping such as anti-rolling devices, sail assisted propulsion as well as the recently developed computerised communication and navigation systems, fuel and ship management systems, require ship officers and engineers with advanced training, higher degree of knowledge, skills and attitudes. It is essential that shipboard personnel should be very familiar with ship construction, systems, stability and strength matters as well as ship operation considerations.
6.2 RECOMMENDATIONS

It is clear from the changing role of the seafarer, future training will be different from that of the past. First and foremost, there will be the need for more training of seafarers than exists at present. Considering a completely new manning situation and very new technology, education and training of seafarers will need a new approach.

My recommendations will cover only up-to-date training, simulators, computer application, crew size, and dual purpose crew and management considerations.

6.2.1 UP-TO-DATE TRAINING

The point in mentioning recent developments in shipping is to emphasize the need in modern ships for all senior officers and watch keepers to be thoroughly familiar with the specific equipment in a ship before assuming any responsibility.

The necessity of providing updating training for shipboard personnel is designed to keep them properly informed about the latest changes in marine technology and commercial practice which would enable them to rapidly respond to new situations without harm to the efficiency of ship operations.

New requirements of various international conventions ought to be thoroughly explained to seafarers during updating training to speed up the implementation of pollution prevention and safety standards.
It is strongly recommended that a system of periodical updating training for graduates of the maritime academy should be introduced under the control of the maritime administration.

6.2.2 SIMULATOR

Training has come a long way from the "chalk and talk" of the college classroom. Simulators are capable of accelerating experience in a way that was never before possible, providing intensive training in specific task. They can provide much more than training in radar competency with the most modern equipment. All types of other shipboard tasks, and contingencies can be simulated: pilotage, bridge-team training, the operation of main machinery and pump room controls, cargo handling and much more.

Besides the STCW, IMO has approved a series of different standards to enhance the safety of shipping and recommended that radar simulator training be given to all masters and deck officers. Proper ship simulator training can help preventing the marine casualties which result from human error. Simulation could assist to demonstrate particular task which marine officers are required to perform.

A generally accepted simulator which is recommended by the author for installation in a training centre can perform the following functions:

- To create a dangerous situation which does not actually exist;
- To repeat the same situation;
- To create any place and any condition in a training environment;
To change parameters easily to the conditions required.
- To train students economically and in a short time;
- To study human performance under stress;
- To study man-machine interrelations.

6.2.3 COMPUTER APPLICATION

The recent development of computers and their application in on board systems, such as communication and navigation systems as well as ship structure, ship management systems and monitoring, require ship officers and engineers with advanced training.

All marine officers should be more familiar with computers and their applications than nowadays. For these purposes all officers regardless of degree of computerization of vessels they sail on ought to be given theoretical and practical courses with the use of the above mentioned computerized equipment.

6.2.4 CREW SIZE

Automation made central control and even an unmanned engine-room possible. With the adoption of unmanned engine room and bridge control of the main engine crew size has been reduced.

Nowadays experts in world shipping are arguing about the effectiveness of highly automated vessels with reduced manning. Indeed, although it is quite possible to save money on crew cuts, effective operation of such ships is dubious in terms of potential losses stemming from lack of safety.
Whatever is a choice of shipowners, the task of the training centre is to provide specialists with adequate skills. Therefore, to meet requirements of shipowners in properly trained personnel for highly automated ships it would be recommended that training centre should closely cooperate with shipping companies in order to get financial support from them for special costly arrangements for the training process.

6.2.5 DUAL PURPOSE

Dual purpose officers are going to be popular in many countries. For example, France and the USA (Kings Point) started dual purpose training some years ago. Greater integration of the training of marine officers in the future is expected to continue.

The operation of modern and sophisticated vessels require deck officers with knowledge about the capabilities and limitations of their vessels and engineers who appreciate the ship operation requirements and ship system demands. It can be expected that following the above mentioned tendency of dual purpose officers our maritime academy will introduce into its programme special integrated course for maritime officers.

In the event of creation of such a course the task of the training centre should be to respond to innovation. This can be reached by cooperation with the academy in terms of considering syllabi for future training.
Today, good communication makes it much more appropriate for the skills to be divided between ship and shore. The personnel aboard ship and in the office ashore are equally critical so perhaps there is a need to have similar sort of training for both ship and shore.

In order to achieve "Collective Competence", shore personnel training is vital for better understanding of specific tasks and problems of ship crew members and enhancing ship-shore connection. Joint training of shore and ship personnel on matters of communication is also recommended.

I dare to hope that the project I have been working upon in the course of my study at the World Maritime University will contribute to the accomplishment of the main goals of the IMO, i.e. "Safer Ships and Cleaner Oceans" through the establishment of a training centre for bearers of the most romantic and honourable title of seafarer.
BIBLIOGRAPHY

1. Accident Prevention Onboard Ship at Sea and in Port - ILO, Geneve, 1980
4. Casualties to Vessels and Accidents to Men, HMSO 1988
22. International Federation of Shipmasters' Associations - The Human Element in Maritime Casualties, 1990
23. Jurdzinski, Miroslaw - Training Standards and Future Requirements in Eastern Europe in Maritime Training Forum EUROPE'89.


33. Safety at Sea, monthly magazines, 1991, 1992


39. U.K Department of Transport - Scrutiny of Marine Exams and Certification of Seamen, Department of Transport

40. U.K Department of Transport - Certificates of Competency and Operator Licenses in the Merchant Navy, Department of Transport, 1982

42. U.N. Economic and Social Commission for Asia and the Pacific, Seminar on Seafarers Training and Certification, 3-7 Oct. 1983 Tokyo/Kobe, Japan


Appendices
<table>
<thead>
<tr>
<th></th>
<th>Survival equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Survival equipment</strong></td>
</tr>
<tr>
<td>1.1</td>
<td>1 x 7.5 metres totally enclosed motor propelled survival craft (TEMPS) complete</td>
</tr>
<tr>
<td></td>
<td>with spray system, fixed and loose equipment</td>
</tr>
<tr>
<td>1.2</td>
<td>Gravity davit suitable for TEMPS complete with electric hoist motor</td>
</tr>
<tr>
<td>1.3</td>
<td>Slewing davit suitable for both fast rescue boat and davit-launched liferaft</td>
</tr>
<tr>
<td></td>
<td>complete with electronic hoist motor</td>
</tr>
<tr>
<td>1.4</td>
<td>1 x 12 persons davit-launched inflatable without survival pack, liferaft, basic</td>
</tr>
<tr>
<td></td>
<td>- no extras</td>
</tr>
<tr>
<td>1.5</td>
<td>1 x 6 persons inflatable liferaft, without survival pack, in GRP container with</td>
</tr>
<tr>
<td></td>
<td>cradle and hydrostatic release</td>
</tr>
<tr>
<td>1.6</td>
<td>Full liferaft emergency survival pack for classroom display</td>
</tr>
<tr>
<td>1.7</td>
<td>Inflatable liferaft training video</td>
</tr>
<tr>
<td>1.8</td>
<td>Survival craft radar transponder</td>
</tr>
<tr>
<td>1.9</td>
<td>Two-way VHF radio telephone equipment. Three hand-portables</td>
</tr>
<tr>
<td>1.10</td>
<td>1 satellite 406 Mhz. (EPIRB) without radio inside for demonstration purposes only</td>
</tr>
<tr>
<td></td>
<td>(dummy)</td>
</tr>
<tr>
<td>1.11</td>
<td>4 inflatable 3 standard lifejackets, different types, for classroom display</td>
</tr>
<tr>
<td>1.12</td>
<td>30 standard lifejackets for student use in practical exercises</td>
</tr>
<tr>
<td>1.13</td>
<td>10 working lifejackets, inflatable, for staff and technicians</td>
</tr>
<tr>
<td>1.14</td>
<td>3 automatic inflation lifejackets</td>
</tr>
<tr>
<td>1.15</td>
<td>1 helicopter lifting strop</td>
</tr>
<tr>
<td>1.16</td>
<td>3 immersion suits</td>
</tr>
<tr>
<td>1.17</td>
<td>3 thermal protective aids</td>
</tr>
</tbody>
</table>
1.18 1 Neil Robertson stretcher
1.19 3 first-aid kits without drugs
1.20 1 resuscitation set
1.21 3 lifebuoys and 2 with lines (1 with light)
1.22 1 (manouverboard) smoke signal (dummy)

Sub-total

2. **Fire-fighting equipment**
2.1 An assortment of hand extinguishers, cut-away models
2.2 1 international ship-to-shore fire hose connection
2.3 Respiration and resuscitation demonstration aids
2.4 1 Siebe Gorman Marine Airmaster positive pressure set
2.5 1 Neil Robertson stretcher, 1 Paraguard stretcher
2.6 1 air compressor unit
2.7 6 sets breathing apparatus with spare cylinders, spare parts and tool kit
2.8 12 distress signal units for attachment to BA sets
2.9 5 fire hoses 45 mm diameter
2.10 4 fire branches (2 standard jet, 2 jet/spray combined)
2.11 2 mechanical foam branches
2.12 1 high expansion foam generator and foam compound
2.13 2 standpipes with keys and bars to operate hydrant supply
2.14 3 x 9 litre water extinguishers
2.15 3 x 9 litre foam extinguishers
2.16 3 x 15 kg CO₂ extinguishers
2.17 3 x 10 kg dry powder extinguishers
2.18 4 x 36 m safety lines and snaphooks
2.19 1 smoke helmet and bellows
2.20 2 stretchers
2.21 2 first-aid kits
2.22 1 resuscitation set
2.23 12 sets firemen's outfits complete
### ANNEX II

#### RECOMMENDED LIST OF PUBLICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Title</th>
<th>Author/Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>MARITIME LAW</strong></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>CHORLEY &amp; GILES' SHIPPING LAW</td>
<td>Giles, O.C., Pitman Publishing Ltd.</td>
</tr>
<tr>
<td>1.2</td>
<td>BUSINESS AND LAW FOR THE SHIPMASTER</td>
<td>Hopkins, L., Brown, Son and Ferguson Ltd.</td>
</tr>
<tr>
<td>1.3</td>
<td>PAYNE AND IVAMY'S MARINE INSURANCE</td>
<td>Ivamy, E.R.H., Butterworth</td>
</tr>
<tr>
<td>1.4</td>
<td>TEMPLEMAN ON MARINE INSURANCE: ITS PRINCIPLES AND PRACTICE</td>
<td>Lambeth, R.J., Pitman Publishing Ltd.</td>
</tr>
<tr>
<td>1.5</td>
<td>THE INTERNATIONAL LAW OF THE SEA</td>
<td>O'Connell, D.P., Oxford University Press</td>
</tr>
<tr>
<td>2.</td>
<td><strong>NAVIGATION</strong></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>AUTOMATIC RADAR PLOTTING AIDS MANUAL</td>
<td>Bole, A.G. &amp; Jones, K.D., Heinemann (William) Ltd.</td>
</tr>
<tr>
<td>2.2</td>
<td>A GUIDE TO COLLISION AVOIDANCE RULES</td>
<td>Cockcroft, A.N., Stanford Maritime Ltd.</td>
</tr>
<tr>
<td>2.3</td>
<td>A SEAMAN'S GUIDE TO THE RULES OF THE ROAD</td>
<td>Ford, J.W.W., Morgans Technical Books Ltd.</td>
</tr>
<tr>
<td>2.4</td>
<td>THE USE OF RADAR AT SEA</td>
<td>Wylie, F.J., Hollis and Carter</td>
</tr>
<tr>
<td>2.5</td>
<td>RADAR OBSERVERS' HANDBOOK</td>
<td>Burger, W., Brown, Son and Ferguson Ltd.</td>
</tr>
<tr>
<td>2.6</td>
<td>COLLISION CASES – JUDGEMENTS AND DIAGRAMS</td>
<td>Holdert, H.M.C. &amp; Buzek, F.J., Lloyd's of London Press Ltd.</td>
</tr>
<tr>
<td>2.7</td>
<td>PRINCIPLES OF NAVIGATION</td>
<td>Anderson, E.W., Hollis and Carter</td>
</tr>
<tr>
<td>2.8</td>
<td>AMERICAN PRACTICAL NAVIGATOR, VOLUME 1</td>
<td>Bowditch, N., Defense Mapping Agency (USA)</td>
</tr>
<tr>
<td>2.9</td>
<td>NAVIGATION FOR WATCHKEEPERS</td>
<td>Fifield, L.W.J., Heinemann (William) Ltd.</td>
</tr>
<tr>
<td>2.10</td>
<td>RADAR AND ELECTRONIC NAVIGATION</td>
<td>Sonnenberg, G.J., Butterworth</td>
</tr>
<tr>
<td>2.11</td>
<td>A GUIDE TO THE PLANNING AND CONDUCT OF SEA PASSAGES</td>
<td>UK Dept. of Transport, HMSO, London</td>
</tr>
<tr>
<td>2.12</td>
<td>ELEMENTS OF NAVIGATION AND NAUTICAL ASTRONOMY</td>
<td>Cotter, C.H., Brown, Son and Ferguson Ltd.</td>
</tr>
<tr>
<td>2.13</td>
<td>MARINERS' HANDBOOK</td>
<td>Great Britain Hydrographic Dept.</td>
</tr>
<tr>
<td>2.14</td>
<td>MODERN CHART WORK</td>
<td>Squair, W.H., Brown, Son and Ferguson Ltd.</td>
</tr>
<tr>
<td>Item</td>
<td>Title</td>
<td>Author/Publisher</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2 15</td>
<td>BRIDGE PROCEDURES GUIDE</td>
<td>IC S. Witherby</td>
</tr>
<tr>
<td>2 16</td>
<td>NOTES ON COMPASS WORK</td>
<td>Kemp, J F &amp; Young, P., Stanford Maritime Ltd</td>
</tr>
<tr>
<td>2 17</td>
<td>THE SHIP'S COMPASS</td>
<td>Grant, G M &amp; Klinkert, J., Routledge and Kegan Paul Ltd.</td>
</tr>
<tr>
<td>3.</td>
<td>NAVAL ARCHITECTURE</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>SHIP DESIGN AND CONSTRUCTION</td>
<td>Taggart, R., Society of Naval Architects and Marine Engineers (SNAME)</td>
</tr>
<tr>
<td>3.2</td>
<td>SHIP CONSTRUCTION, SKETCHES AND NOTES</td>
<td>Kemp, J.F., &amp; Young, P., Stanford Maritime Ltd.</td>
</tr>
<tr>
<td>3.3</td>
<td>STABILITY AND TRIM FOR THE SHIP OFFICER</td>
<td>George, W.E., Cornell Maritime Press</td>
</tr>
<tr>
<td>3.4</td>
<td>SHIP CONSTRUCTION</td>
<td>Eyres, E.J., Heinemann (William) Ltd.</td>
</tr>
<tr>
<td>3.5</td>
<td>MERCHANT SHIP STABILITY</td>
<td>Lester, A.R., Butterworth</td>
</tr>
<tr>
<td>3.6</td>
<td>SHIPS AND NAVAL ARCHITECT</td>
<td>Munro-Smith, R., Institute of Marine Engineers</td>
</tr>
<tr>
<td>3.7</td>
<td>STRENGTH OF MATERIALS AND STRUCTURES</td>
<td>Case &amp; Chilver, Edward Arnold</td>
</tr>
<tr>
<td>4.</td>
<td>MARINE ENGINEERING</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>ADVANCED ELECTRICAL TECHNOLOGY</td>
<td>Cotton, H., Pitman Publishing Ltd.</td>
</tr>
<tr>
<td>4.2</td>
<td>PRACTICAL MARINE ELECTRICAL KNOWLEDGE</td>
<td>Hall, T., Witherby</td>
</tr>
<tr>
<td>4.3</td>
<td>MARINE ELECTRICAL PRACTICE</td>
<td>Watson, G.O., Butterworth</td>
</tr>
<tr>
<td>4.4</td>
<td>OPERATION AND MAINTENANCE OF INERT GAS AND CRUDE WASHING SYSTEMS</td>
<td>Berry, M.G., Interlink Intergas</td>
</tr>
<tr>
<td>4.5</td>
<td>INSTRUMENTATION AND CONTROL SYSTEMS</td>
<td>Jackson, L., Reed (Thomas) Publication</td>
</tr>
<tr>
<td>4.6</td>
<td>MARINE ENGINEERING SYSTEMS</td>
<td>Weddie, A., Heinemann (William) Ltd.</td>
</tr>
<tr>
<td>4.7</td>
<td>REED'S MOTOR ENGINEERING KNOWLEDGE FOR MARINE ENGINEERS</td>
<td>Morton, T.D., Reed (Thomas) Publication</td>
</tr>
<tr>
<td>4.8</td>
<td>FEED WATER SYSTEMS AND TREATMENT</td>
<td>Flanagan, G.T.H., Stanford Maritime Ltd.</td>
</tr>
<tr>
<td>4.9</td>
<td>MARINE ENGINEERING</td>
<td>Harrington, R., Society of Naval Architects and Marine Engineers (SNAME)</td>
</tr>
<tr>
<td>Item</td>
<td>Title</td>
<td>Author/Publisher</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>4.10</td>
<td>PROPERTIES OF ENGINEERING MATERIALS</td>
<td>Higgins, R.A., Hadder and Stoughton</td>
</tr>
<tr>
<td>4.11</td>
<td>GENERAL ENGINEERING KNOWLEDGE</td>
<td>McGeorge, H.D., Stanford Maritime Ltd.</td>
</tr>
<tr>
<td>4.12</td>
<td>REFRIGERATION AT SEA</td>
<td>Munton R. &amp; Scott, J.R., Applied Science Publishers</td>
</tr>
<tr>
<td>4.13</td>
<td>MARINE DIESEL ENGINES</td>
<td>Pounder, C.C., Butterworth</td>
</tr>
<tr>
<td>4.14</td>
<td>NOTES ON INSTRUMENTATION AND CONTROL</td>
<td>Roy, G.J., Stanford Maritime Ltd.</td>
</tr>
<tr>
<td>4.15</td>
<td>ENGINEERING MATHEMATICS</td>
<td>Stroud, K.A., Mc Millan</td>
</tr>
<tr>
<td>4.16</td>
<td>MARINE AUXILIARY MACHINERY</td>
<td>Souchette E. &amp; Smith, Butterworth</td>
</tr>
<tr>
<td>4.18</td>
<td>BASIC ENGINEERING THERMODYNAMICS</td>
<td>Wallace &amp; Linning, Pitman Publishing Ltd.</td>
</tr>
<tr>
<td>5.1</td>
<td>SEAMANSHIP</td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>KNIGHT'S MODERN SEAMANSHIP</td>
<td>Noel, J., Van Nostrand Reinhold</td>
</tr>
<tr>
<td>5.3</td>
<td>BASIC SHIPHANDLING FOR MASTERS, MATES AND PILOTS</td>
<td>Willenton, Stanford Maritime Ltd.</td>
</tr>
<tr>
<td>5.4</td>
<td>KNOW YOUR OWN SHIP</td>
<td>Walton &amp; Baxter, Griffin (Charles) Ltd.</td>
</tr>
<tr>
<td>5.5</td>
<td>MANUAL OF FIREMANSHIP In 11 Parts</td>
<td>Gt. Britain's Home Office, Fire Dept., HMSO</td>
</tr>
<tr>
<td>5.6</td>
<td>SAFETY AND SURVIVAL AT SEA</td>
<td>Lee, E.C.B. &amp; Lee Norton, K., Norton (W.W.I and Co. Ltd.)</td>
</tr>
<tr>
<td>5.7</td>
<td>FIRE ABOARD</td>
<td>Rushbrook, F., Brown, Son and Ferguson Ltd.</td>
</tr>
<tr>
<td>5.8</td>
<td>SURVIVAL AT SEA</td>
<td>Wright, C.H., Brown, Son and Ferguson Ltd.</td>
</tr>
<tr>
<td>5.9</td>
<td>MARINE FIRE PREVENTION, FIRE FIGHTING AND FIRE SAFETY</td>
<td>Brady, R.J., International Book Distributors</td>
</tr>
<tr>
<td>5.10</td>
<td>MARINE CARGO OPERATIONS</td>
<td>Sauerbier, C.L., John Wiley and Sons</td>
</tr>
<tr>
<td>5.11</td>
<td>WORLD DEEP SEA CONTAINER SHIPPING</td>
<td>Pearson, Gower Publishing Company Ltd.</td>
</tr>
<tr>
<td>6.</td>
<td>MARINE POLLUTION</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>TANKER SAFETY GUIDE 4 VOLUMES (CHEMICALS)</td>
<td>ICS, Witherby</td>
</tr>
<tr>
<td>Item</td>
<td>Title</td>
<td>Author/Publisher</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>6.2</td>
<td>INTERNATIONAL SAFETY GUIDE (FOR OIL TANKERS &amp; TERMINALS)</td>
<td>ICS, Witherby</td>
</tr>
<tr>
<td>6.3</td>
<td>TANKER SAFETY GUIDE (Liquefied gas)</td>
<td>ICS, Witherby</td>
</tr>
<tr>
<td>6.4</td>
<td>TANKER HANDBOOK FOR DECK OFFICERS</td>
<td>Baptist, T.C., Brown, Son and Ferguson Ltd</td>
</tr>
<tr>
<td>6.5</td>
<td>TANKER OPERATIONS</td>
<td>MARTON, S., Cornell Maritime Press</td>
</tr>
<tr>
<td>6.6</td>
<td>CLEAN SEAS GUIDE FOR OIL TANKERS</td>
<td>ICS/OCIMF, Witherby</td>
</tr>
<tr>
<td>6.7</td>
<td>TANKER CARGO HANDLING</td>
<td>Rutherford, D.C., Griffin (Charles) Ltd.</td>
</tr>
<tr>
<td>6.8</td>
<td>THE STOWAGE AND PROPERTIES OF CARGOES</td>
<td>Thomas, R.E., Brown, Son and Ferguson Ltd</td>
</tr>
<tr>
<td>6.10</td>
<td>OIL POLLUTION FROM TANKER OPERATIONS, CAUSES, COSTS, CONTROLS</td>
<td>Waters, W.G., Heaver, T.E. &amp; Verrier, T., Centre for Transportation Studies, University of British Columbia</td>
</tr>
<tr>
<td>6.11</td>
<td>PREVENTION OF OIL SPILLAGES THROUGH CARGO PUMP-ROOM SEA VALVES</td>
<td>ICS/OCIMF, Witherby</td>
</tr>
<tr>
<td>7.</td>
<td>OCEANOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>OCEANOGRAPHY AND SEAMANSHIP</td>
<td>Van Doorn, W.G., Dodd</td>
</tr>
<tr>
<td>7.2</td>
<td>METEOROLOGY FOR MARINERS</td>
<td>Meteorological Office, HMSO</td>
</tr>
<tr>
<td>7.3</td>
<td>MARINE OBSERVERS' HANDBOOK</td>
<td>Meteorological Office, HMSO</td>
</tr>
<tr>
<td>7.4</td>
<td>METEOROLOGY FOR SEAMEN</td>
<td>Burgess, C.R., Brown, Son and Ferguson Ltd</td>
</tr>
<tr>
<td>7.5</td>
<td>WEATHER ROUTEING OF SHIPS</td>
<td>Mottie, R., Stanford Maritime Ltd.</td>
</tr>
<tr>
<td>7.6</td>
<td>ADMIRALTY MANUAL OF HYDROGRAPHIC SURVEYING (2 VOLUMES)</td>
<td>Great Britain Hydrographic Dept.</td>
</tr>
<tr>
<td>7.7</td>
<td>SEA SURVEYING (12 VOLUMES)</td>
<td>Ingham, A.E., Wiley (John) and Sons</td>
</tr>
<tr>
<td>7.8</td>
<td>HYDROGRAPHY FOR THE SURVEYOR AND ENGINEER</td>
<td>Ingham, A.E., Grafton Books</td>
</tr>
<tr>
<td>8.</td>
<td>SHIPPING</td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>PORT ECONOMICS</td>
<td>Jansson, J.O. &amp; Shneerson, D., MIT Press</td>
</tr>
<tr>
<td>Item No.</td>
<td>Title</td>
<td>Author/Publisher</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>8.3</td>
<td>CARGO HANDLING AND THE MODERN PORT</td>
<td>Oram, R B., Pergamon Press</td>
</tr>
<tr>
<td>8.4</td>
<td>ELEMENTS OF PORT OPERATIONS AND MANAGEMENT</td>
<td>Branch, A., Chapman and Hall</td>
</tr>
<tr>
<td>8.5</td>
<td>SEA TRANSPORT OPERATIONS AND ECONOMICS</td>
<td>Alderton, P.M., Reed (Thomas) Publication</td>
</tr>
<tr>
<td>8.6</td>
<td>THE SHIPBROKER'S MANUAL</td>
<td>Institute of Chartered Shipbrokers, Lloyd's of London Press</td>
</tr>
<tr>
<td>8.7</td>
<td>ECONOMICS OF TRAMP SHIPPING</td>
<td>Metaxa, B.N., Sweet and Maxwell</td>
</tr>
<tr>
<td>8.8</td>
<td>SCRUTTON ON CHARTER PARTIES AND BILLS OF LADING</td>
<td>Scrutton, T.E., Sweet and Maxwell</td>
</tr>
<tr>
<td>8.9</td>
<td>ECONOMICS OF SHIPPING PRACTICE AND MANAGEMENT</td>
<td>Branch, A.E., Chapman and Hall</td>
</tr>
<tr>
<td>8.10</td>
<td>SEA TRANSPORT OPERATIONS AND ECONOMICS</td>
<td>Alderton, P.M., Reed (Thomas) Publication</td>
</tr>
<tr>
<td>8.11</td>
<td>MANAGING SHIPS</td>
<td>Downard, Fairplay Publications Ltd.</td>
</tr>
<tr>
<td>8.12</td>
<td>PERSONNEL MANAGEMENT IN MERCHANT SHIPS</td>
<td>Moreby, Pergamon Press</td>
</tr>
<tr>
<td>8.13</td>
<td>AN INTRODUCTION TO SHIPPING ECONOMICS</td>
<td>Chrzanowski, I.H., Fairplay Publications Ltd.</td>
</tr>
<tr>
<td>8.14</td>
<td>THE BUSINESS OF SHIPPING</td>
<td>Kendall, L.C., Chapman and Hall</td>
</tr>
<tr>
<td>8.15</td>
<td>SEA TRADING, 2 VOLUMES: VOLUME 1: SHIPS VOLUME 2: CARGOES</td>
<td>Packard, W.V., Fairplay Publications Ltd.</td>
</tr>
</tbody>
</table>

**IMO PUBLICATIONS**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IMO CONVENTION</td>
</tr>
<tr>
<td>2.</td>
<td>INTERNATIONAL BULK CHEMICALS CODE – 1986</td>
</tr>
<tr>
<td>3.</td>
<td>INTERNATIONAL GAS CODE – 1983</td>
</tr>
<tr>
<td>4.</td>
<td>SOLAS – CONSOLIDATED EDITION – 1986</td>
</tr>
<tr>
<td>5.</td>
<td>IMDG CODE – CONSOLIDATED EDITION – 1988</td>
</tr>
<tr>
<td>Item No.</td>
<td>Title</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>6</td>
<td>CONTAINERS - 1972</td>
</tr>
<tr>
<td>7</td>
<td>FACILITATION CONVENTION - 1965</td>
</tr>
<tr>
<td>8</td>
<td>INTERVENTION CONVENTION - 1969</td>
</tr>
<tr>
<td>9</td>
<td>CLC CONVENTION - 1969</td>
</tr>
<tr>
<td>10</td>
<td>FUND CONVENTION - 1971</td>
</tr>
<tr>
<td>11</td>
<td>1954 OIL POLLUTION CONVENTION</td>
</tr>
<tr>
<td>12</td>
<td>1973 MARPOL CONFERENCE</td>
</tr>
<tr>
<td>13</td>
<td>PREVENTION POLLUTION REGULATIONS 73/78 - MARPOL ANNEX I</td>
</tr>
<tr>
<td>14</td>
<td>NOXIOUS LIQUID SUBSTANCES - MARPOL ANNEX II</td>
</tr>
<tr>
<td>15</td>
<td>LONDON DUMPING CONVENTION - 1972</td>
</tr>
<tr>
<td>16</td>
<td>LOAD LINES CONVENTION - 1966</td>
</tr>
<tr>
<td>17</td>
<td>TONNAGE MEASUREMENT CONFERENCE - 1969</td>
</tr>
<tr>
<td>18</td>
<td>COLREG 1972</td>
</tr>
<tr>
<td>19</td>
<td>SHIPS' ROUTEING 1984</td>
</tr>
<tr>
<td>20</td>
<td>AMENDMENT No. 6 SHIPS' ROUTEING</td>
</tr>
<tr>
<td>21</td>
<td>INMARSAT CONVENTION (including Operating Agreement)</td>
</tr>
<tr>
<td>22</td>
<td>SAR CONFERENCE 1979 (SEARCH AND RESCUE)</td>
</tr>
<tr>
<td>23</td>
<td>MERSAR - 1986 EDITION</td>
</tr>
<tr>
<td>24</td>
<td>NAVIGATIONAL VOCABULARY</td>
</tr>
<tr>
<td>25</td>
<td>CODE OF SIGNALS</td>
</tr>
<tr>
<td>26</td>
<td>STCW</td>
</tr>
<tr>
<td>27</td>
<td>IMO SEARCH AND RESCUE MANUAL</td>
</tr>
</tbody>
</table>

For further information please see the IMO Publications Catalogue.
LIST OF IMO RESOLUTIONS ADOPTED BY ASSEMBLY
RELATING TO MARITIME TRAINING

International convention on Standards of Training, Certification and Watchkeeping for Seafarers, and its related resolutions

- A.89(IV) Training of seafarers
- A.124(V) Recommendation on crew training
- A.188(IV) Training of masters, officers and crew
- A.285(VII) Recommendation on basic principles and operational guidance relating navigational watchkeeping
- A.286(VIII) Recommendation on training and qualification of officers and crews of ships carrying hazardous or noxious chemicals in bulk
- A.337(IX) Recommendation on principles and operational guidance for deck officers in charge of a watch in port
- A.437(XI) Training of crews in fire fighting
- A.438(XI) Training and qualification of person in charge of medical care aboard ship
- A.481(XII) Principles of safe manning
- A.482(XII) Training in the use of automatic radar plotting aids (ARPA)
- A.483(XII) Training in radar observation and plotting
- A.484(XII) Basic principles to be observed in keeping a navigational watch on board fishing vessel
- A.485(XII) Training, qualification and operational procedures for maritime pilots other than deep-sea pilots
- A.537(13) Training of officers and ratings responsible for cargo handling on ships carrying dangerous and hazardous substances in solid form in bulk or in packaged form
- A.538(13) Maritime safety training of personnel on mobile offshore units
- A.539(13) Certification of skippers and officers in charge of a navigational watch on fishing vessel of 24 metres in length and over
- A.576(14) Standards for skippers and officers in charge of a navigational watch on fishing vessel of less than 24 metres in length operating in unlimited and limited waters.