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WORLD MARITIME UNIVERSITY
MALMÖ, SWEDEN

A PROPOSAL FOR UPGRADING THE SAFETY COURSES
FOR MARINE PERSONNEL IN GREECE

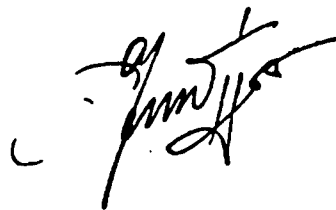
by
Christoforos K. Papatheofilou
Greece

A paper submitted to the Faculty of the World Maritime University
in partial satisfaction of the requirements for the award of a

MASTER OF SCIENCE DEGREE
in
MARITIME EDUCATION AND TRAINING (NAUTICAL).

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

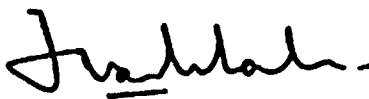
Signature:



Date: 28 October 1988

Supervised and assessed by:

Hans van Walen
Lecturer
World Maritime University



Co-assessed by:

Per Eriksson
Safety Director (ret.)
Swedish National Administration for Shipping and Navigation
Visiting Professor World Maritime University



**A proposal
for Upgrading
the Safety Courses
for Marine Personnel
in Greece**

by: Cr. Papatheofilou

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A B S T R A C T

This work makes proposals for the up-grading of the system of education and training for fire-fighting and sea survival techniques within the Greek merchant navy fleet.

In this light the renovation of an existing training center in northern Greece which would work in conjunction with an up-graded form of that of Southern Greece is proposed.

This work, after being translated into Greek, will be submitted to the Greek Ministry of Merchant Marine, in the hope that it will be accepted and soon implemented for the benefit of Greek seafarers and the shipping industry as a whole.

F O R W A R D

With the advent of Greece's entry in the E.E.C. the number of jobs on land increased, drawing the necessary work force from the mercantile industry.

Due to this shortage, a positive effort is being made to cover the need of manpower in parallel with up-grading the educational standards of the present system so as to be able to cope with the new technological advances of the present and the envisaged future and to render an opportunity for future on shore employment with respect to an equilibrium social standing of the respective seafarer.

Presently in Greece there is only one active training center for safety courses which has fulfilled the requirements of safety onboard Greek merchant ships.

As shown in the table below, in the past three years the following seafarers have been certified and since inauguration of the Training Center in 1971, approximately 75,000 seafarers have been duly certified.

Years	Officers	Ratings	Others
1985	2,000	2,500	80
1986	1,500	1,700	130
1987	1,100	1,200	50

This brings to light the fact that there is no sea-going seafarer today in the Greek merchant marine who have not been duly certified as regards the sea-survival and fire fighting courses.

The principle advantage of the existing training center is that it is situated in the midst of all technically related shipping activity such as shipyards, utilising the facilities of the Marine Academy in which grounds it is situated.

The primary disadvantage of this Training Center is that it is the only one of its kind presently acting in Greece with the result that seafarers from all over the nation have to gather at this focal point, thereby creating social economic problems.

This problem may be solved by creating a second training center in the northern part of Greece giving the prospective trainees the choice of attending the center which fits them best.

From the governmental point of view, the second training center will facilitate up-graded courses to be held as the amount of persons attending them will be less than that of those for only one training center.

I N T R O D U C T I O N .

As the demand for knowledge and ability of the modern seafarer increases with the advent in the trend of technology the continuous up-grading of safety courses is deemed necessary.

As the present safety courses in Greece are based on the traditional system of training, this study can be presented as a proposal for the up-grading of the existing safety courses in Greece.

The up-grading is recommended to be carried out in the following manner.

As a guide-line the respective model courses for sea-survival and fire-fighting of IMO have been utilised. As regards sea survival, a course has been formulated with the proposition that all prospective seafarers should attend this course named "A".

A proficiency course, known as "B", has been formulated for deck and engine officers and some ratings who hold key positions and who are responsible for the safety of the crew and the passengers.

In the stated course the trainees undergo more in depth training in the commanding of the crew with regard to emergencies and critical situations.

In parallel to the above, two fire-fighting courses have been formulated; the former, known as "C", is the basic course for all prospective seafarers, and the latter for deck and engine officers who deal deeply in the theory of combustion, especially with relation to specialised ships such as oil, chemical and gas carriers.

Furthermore, a course named "D" has been devised to supplement "C" giving the same exposure as to that to "C", but with more practical exercises. This course will be

suitable for deck and engine officers and ratings who would be responsible positions in the event of an emergency.

It is proposed that no advanced course may be taken if the respective basic course has not being completed.

All prospective seafarers apart those graduating from the higher marine academies, who undergo similar training included in their syllabus, should partake in a First Aid course named "F".

Any repetition of subject matter, for any given course, is considered necessary being of vital importance.

In Chapter I, the respective courses outlines, syllabuses and the time tables are presented.

Chapter II deals primarily with the seafarers and the new requirements and subsequently with the prospective seafarers' requirements. Both cases are also summarized in tabulated form.

In Chapter III, one may see a detailed analysis of how the training center should be run according to the number of applicants. The maximum number of participants is also estimated.

In Chapter IV, the presentation of the academic administrative infrastructure that is needed for the establishment of the training center, is depicted. The chapter ends with a study on how many "full" and "part-time" instructors should be required for maximum output. The optimum number has also been calculated.

Finally in Chapter V the general regulations of attendance and trainees' obligations can be found.

Furthermore the attached Appendix, which is divided into three sectors, contains primarily proposed indicative time charts depicting the sequence of promotion for Greek seafarers so as to facilitate prospective seafarers

in planning their education with regard to safety requirements.

Secondly, plans of the center's facilities are given. No changes in the existing buildings are required.

The third sector of the Appendix is a listing of the equipment needed for covering the needs of maximum capacity. Most of them are already available in the training center's storage rooms and some are in use by the personnel of the Marine Academy of N. Mihaniona for teaching purposes according to their needs.

CHAPTER

I

Safety Courses in Greece

by

Christoforos Papatheofilou

CHAPTER I

I.1 Course A

Basic Sea Survival Course

Course Outline

- 1. Introduction (01.10)**
 - 1.1 Organization and training
 - 1.2 Actions prior to abandonment
 - 1.3 Drills and their value
 - 1.4 Embarkation

- 2. Description and use of lifeboats/rafts (00.45) (01.15)**
 - 2.1 Description - location
 - 2.2 Markings
 - 2.3 Equipment carried
 - 2.4 Instructions to use the equipment
 - 2.5. Quantity of food and water
 - 2.6 Parts of lifeboat/raft
 - 2.7 Additional provisions
 - 2.8 Lifeboat's signals
 - 2.9 Rough weather routine
 - 2.10 Survival

- 3. Launching a lifeboat (00.45)**
 - 3.1 Signal
 - 3.2 Alarm signals
 - 3.3 Pre-launching checks
 - 3.4 Main work-list
 - 3.5 Dangers during launching

- 4. Carrying out a life-boat drill (04.10)
 - 4.1 Lifeboat drill
 - 4.2 Repeat until minimum time achieved
 - 4.3 Rowing

- 5. Carrying out a "dry" liferaft drill (01.30)
 - 5.1 Life-jacket use
 - 5.2 How to enter the water from a certain height
 - 5.3 Safety cautions
 - 5.4 Description of a raft's use
 - 5.5 Raft's survival pack
 - 5.6 Rules on boarding a liferaft

- 6. Carrying out a "wet" liferaft drill (03.00)
 - 6.1 Demonstrating the operation
 - 6.2 Life-jacket
 - 6.3 Boarding dry
 - 6.4 Entering the water
 - 6.5 Capsizing the raft
 - 6.6 Boarding the raft unaided
 - 6.7 Carrying an injured person
 - 6.8 Checking the initial actions
 - 6.9 Repeating the exercise rapidly

- 7. Survival (Elements of survival craftmanship) (01.40)
 - 7.1 Initial actions in cold and hot climates
 - 7.2 Secondary actions
 - 7.3 Subsequent actions
 - 7.4 Basic rules-actions
 - 7.5 Helicopter rescue
 - 7.6 Lifeboat station signals
 - 7.7 Rules on board a liferaft

8. Other sea-survival appliances		(01.30)
8.1 Other types of sea-survival appliances		
8.1.1 life-buoys		
.2 self igniting		
.3 self activating smoke signal		
.4 buoyant life lines		
8.2 Safety signs		
8.3 Expired pyrotechnics		
8.4 Line-throwing apparatus		
8.5 Ship-to-ship transportation exercise		
8.6 Immersion suit		
8.6.1 description		
.2 availability in rescue buoys		
.3 about passenger & cargo ships		
.4 thermal protective aid		
.5 availability in lifeboats		
9. Survival radio-equipment		(01.00)
9.1 Portable radio apparatus		
9.2 Various types		
9.3 How to carry and lower		
9.4 E.p.i.r.b		
10. Film Demonstrations		
10.1 DS15/1		
"Preparing for abandonment",	20 minutes	
10.2 DS15/2		
"Abandonment by lifeboat",	20 minutes	
10.3 DS15/4		
"Techniques of survival",	20 minutes	
10.4 DS2		
"This is your liferaft",	15 minutes	
	-----	-----
Total time needed (included)	75 minutes	(18.00)

**BASIC SEA SURVIVAL COURSE
TIME TABLE**

	1st DAY	2nd DAY	3rd DAY
1st period 1.5 hours	1. Introduction and film: DS15/1 "Preparing for abandonment." (17 minutes)	4.2 Repeat and complete the lifeboat drill 4.3 Rowing	2. Description and use of a liferaft. film: DS2 "This is your liferaft." (15 minutes)
2nd period 1.5 hours	2. Description and use of lifeboats. and	7. Survival film: DS15/4 "Techniques of survival" (21 minutes)	5. Carrying out a liferaft "dry" drill.
3rd period 1.5 hours	3. Launching a lifeboat. film: DS15/2 "Abandonment by lifeboat" (18 minutes) 4. Carrying out lifeboat drill	7. Continued and 9. Survival radio equipment	6. Carrying out a "wet" life raft drill.
LUNCH break (30 minutes)			
4th	4. Continued.	8. Other sea- survival appliances	6. Continued.

Basic Sea Survival Course

Course Syllabus

1. INTRODUCTION

- 1.1 The importance of good organization and training
Various rules for the better use of the vessel's sea survival appliances.
- 1.2 Actions prior to abandonment
Clothing and extra equipment. (Warmth and water)
Sensible use of time prior to abandonment.
- 1.3 Drills and their value
The importance of being well trained and familiarized with the life-saving appliances on board ships. To understand the value of a launching drill.
- 1.4 Embarkation
How to embark and get to the right place.
Panic and its consequences.
Muster at the assigned stations.

2. DESCRIPTION AND USE OF LIFE-BOATS/RAFTS

(To prepare the participants for the drills)

- 2.1 Description. Location on board a ship.
- 2.2 Markings. Persons to carry.
- 2.3 Lifeboat's and raft's equipment and the right way of their use.
- 2.4 To know the right place where to find the relevant instructions for use the above.
- 2.5 To know the minimum quantity of food and water which every boat/raft has to carry according to the present regulations.
- 2.6 To name every part of the life-boat/raft. (Name

and use.)

- 2.7 Additional equipment to carry when there is time enough to do so.
- 2.8 The use of the boat's/raft's signals. Pyrotechnics. When and how to use.
- 2.9 To describe rough weather routine. (Detailed)

3. LAUNCHING A LIFE-BOAT

- 3.1 "Abandon ship" signal. The actions to be taken right after the signal.
- 3.2 To understand clearly the difference between : alarm signal, abandoning signal and fire alarm.
- 3.3 Pre-launching checks and extra precautions such as : toggle painter, drain plug, gear, engine's test, personnel check, safety pins, etc.
- 3.4 Main work-list: letgo the gripes, clear the locks, low to embarkation deck, holding blocks and bousing-in tackles. The right moment to release the blocks.
- 3.5 Dangers during the launching procedure.

4. CARRYING OUT A LIFE-BOAT DRILL

- 4.1 Complete drill for life-boats.
- 4.2 To repeat the drill till the minimum time has been achieved.
- 4.3 Rowing to secure the boat away from a sinking boat.

5. CARRYING OUT A "DRY" LIFE-RAFT DRILL

- 5.1 Description of all kind of life-jackets and how they are distributed on board a passenger/cargo ship.
 - how buoyancy is achieved.
 - fixed equipment. (lights and whistles)

- .1 donning a common life-jacket correctly within a period of less than one minute unaimed.
- .2 testing the whistle and the light.
- .3 donning an inflatable life-jackets correctly within a period of less than a minute unaimed and
- .4 testing the whistle of the above, and the non-automatic method of inflation.
- 5.2 Checking the fitting and use of life-jackets.
- 5.3 Understanding the right procedure for entering the water from a certain height.
- 5.4 Safety cautions.
- 5.5 Describing the operation of inflatable life-rafts and their ancillary equipment.
- 5.6 Describing the use of the life-raft's survival pack.
- 5.7 Listing the initial and vital actions upon boarding the liferaft.

6. CARRYING OUT A "WET" LIFE RAFT-DRILL

- 6.1 Demonstrating the operating of a life-raft.
- 6.2 Getting ready with all respects while wearing a life-jacket.
- 6.3 The participants board the life-raft "dry" once
- 6.4 They enter the water from a height of four (4) meters, at least two (2) times.
 - 6.4.1 They swim while wearing their life-jackets for a certain distance.
- 6.5 To Capsize the raft once.
- 6.6 They have to board the raft from the water unaimed.
- 6.7 Carrying and bringing onboard the raft an injured person once.
- 6.8 Checking all the initial actions on board the

life-raft.

- 6.9 Repeating the whole exercise rapidly including:
aimed entry, taking the right position onboard
the raft when it is overloaded.

7. **SURVIVAL. Elements of survival craftmanship.**

- 7.1 Initial actions in cold and hot climates.
"Clothing": the importance of maintaining body
heat.
- 7.2 Secondary actions in hot and cold climates.
The importance of insulation.
Treatment of injured survivors.
Seasickness. Sea water and relevant dangers.
Bail-out, working up.
Congregation of rafts and boats.
Food. Birds and fish. Carbonates, protein.
Sharks and their repellants. The use of
bunkers.
Hypothermia.
- 7.3 Subsequent actions.
Leader, sharp objects, roll call, routine
watches, search for survivors, post lookouts,
handbook, passing water, water and food.
- 7.4 Basic rules-actions
Cut the painter, stream the drogue, close and
maintain the raft in good condition.
Maintain the hierarchy.
- 7.5 To know the equipment needed for a rescue by a
helicopter. Evacuation from life-boats/rafts.
- .1 methods of picking-up.
 - .2 how to assist.
 - .3 obeying the instructions given by the pilot of
the helicopter.
 - .4 describing the harness/strop.

- 7.6 Life-boat station signals.
- 7.7 Additional useful rules for protecting the crew and passengers from the sun, heat or cold.
- 7.8 Explaining the measures for survival in case of fire or oil on the water.

B. OTHER SEA-SURVIVAL APPLIANCES

- B.1 Defining and know how to use various saving appliances on passenger and cargo ships.
 - .1 Life-buoys. How they are distributed on a ship.
 - .2 Additional equipment attached to the life-buoys
 - buoyant life-line
 - light/smoke combination and
 - self-activating smoke signal
- B.2 Safety signs (IMOs).
- B.3 Expired pyrotechnics and relevant dangers.
- B.4 Line-throwing apparatus. How to use. Dangers when using the apparatus specially when one of the two (2) ships (or both) is a tanker.
- B.5 SHIP TO SHIP or SHIP TO SHORE transportation mechanism.
- B.6 Immersion suit
 - .1 describes an immersion suit.
 - .2 states that an immersion suit should be available to every person assigned to crew the ship's rescue boat.
 - .3 states that for passenger and cargo ships with non-enclosed life-boats, at least three (3) immersion suits shall be carried for each life-boat.
 - .4 states the main purpose of a thermal protective aid.
 - .5 states that for passenger and cargo ships with non enclosed life-boats, a thermal protective

aid must be provided for persons not provided with an immersion suit.

9. SURVIVAL RADIO EQUIPMENT

- 9.1 Various types of radio equipment carried on life boats. Location onboard the ships. Safe ways of carrying the equipment onboard the boat. The possibilities of lowering or dropping the radio to the boat or to the water.
- 9.2 Recognises additional dangers of dropping the apparatus as danger to survivors in the sea and as risk of damage to the equipment striking any floating debris.
- 9.3 States that not any type of survival radio equipment should be left secured on a sinking ship.

CLASSROOM DISPLAYS

- 1.- Automatic hydrostatic release unit.
- 2.- Portable radio unit.
- 3.- E.p.i.r.b.
- 4.- Life-jacket's donning instructions.
- 5.- Life-raft equipment.
- 6.- How to enter a life-raft instructions.
- 7.- I.M.O.'s safety signs.
- 8.- Search and rescue patterns.
- 9.- Pyrotechnics.
- 10.- Line throwing apparatus.

I.2 Course B

Proficiency
in
Survival Craft
course

Course Outline

1. Survival craft and its contents (01.00)
 - 1.1 List of equipment.
 - 1.2 Equipment check.

2. Launching a lifeboat (00.30)
 - 2.1 Procedure
 - 2.2 Starting the engine.
 - 2.3 Davits.

3. Handling a survival craft (01.07)
 - 3.1 Supervising. +
 - 3.2 Clearing the boat under oars and engine. (09.00)
 - 3.3 Coxing the boat under oars. (practice)
 - 3.4 General operation (engine).
 - 3.5 Wave quelling oil.
 - 3.6 Rough weather handling.
 - 3.7 Stream handling.
 - 3.8 Beaching the lifeboat.
 - 3.9 Coast-Guard beaching signals.
 - 3.10 Lifeboat's compass, use and steering with.
 - 3.11 Rigging on a sea-anchor.

4. Shipboard arrangements (01.30)
 - 4.1 Boat-deck plans.

- 4.2 Commanding a drill.
 - 4.3 Maintenance of discipline.
 - 4.4 Emergency situations in:
 - .1 Collision
 - .2 Fire
 - .3 Foundering
 - 4.5 Muster-list planning
 - 4.6 What to know about any emergency situation.
 - 4.7 Abandonment - extra equipment.
 - 4.8 Abandonment - unexpected situations.
- 5. Helicopter assistance (01.30)**
- 5.1 Communications
 - .1 in sight
 - .2 not in sight
 - 5.2 Evacuation
 - .1 from a ship
 - .2 from a survival craft
 - 5.3 Helicopter pick-up
 - .1 Methods
 - .2 Instruction given
 - .3 The use of the harness
- 6. Operating survival radio equipment (01.30)**
- 6.1 Installation
 - .1 Passenger ships
 - 6.2 Lid's contents
 - 6.3 The use of "test link"
 - 6.4 Layout of set
 - 6.5 How the set transmits and receives
 - 6.6 How to tune on 2182 KHz
 - 6.7 How to tune on 500 KHz
 - 6.8 How to tune on 8364 KHz
 - 6.9 How to earth the set

- 6.10 Aerials
- 6.11 Keying devices
- 6.12 Battery recharge
- 6.13 The automatic alarm (2182 KHz)
- 6.14 The automatic alarm (500 KHz)

- 7. Portable radio apparatus for survival craft. (01.00)
 - 7.1 Required number
 - 7.2 Place and stowage
 - 7.3 The use of the key device
 - 7.4 Battery recharge
 - 7.5 Aerial
 - 7.6 The use of the receiver

- 8. E.P.I.R.B. (00.15)
 - 8.1 Purpose
 - 8.2 Number and location
 - 8.3 Activation

- 9. Search And Rescue. (01.15)
 - 9.1 The worldwide system
 - 9.2 Necessary procedures
 - 9.3 Search techniques
 - 9.4 Man overboard

- 10. More information on survival (00.30)
 - 10.1 Survivors protection
 - 10.2 Rations
 - 10.3 Discipline maintenance
 - 10.4 Survivors' comfort

**PROFICIENCY IN
SURVIVAL CRAFT
COURSE**

	1st DAY	2nd DAY	3rd DAY	4th DAY
1st per 1.5 hrs	1.Survival- craft and contents. 2.Launching a life-boat	4.Shipboard arrangements	5.Helicopter assistance. film: DS5 "Helicopter assistance at sea" (29 minutes)	9. Search and Rescue 7. Portable radio- apparatus
2nd per 1.5 hrs	3.Handling a survival (theory) film:DS15/3 Abandonment by life-raft (23 minutes)	3.continued practice	6.Survival radio equip- ment	7.continued B.E.p.i.r.b film: DS14 Satellite life-line (20 minutes)
3rd per 1.5 hrs	3.Handling a survival raft (practicing)	3.continued practicing	3.continued practicing	Practical demonstration of bridge- pyrotechnics
	LUNCH break (30 minutes)			
4th per 1.5 hrs	3.continued practice	3.continued practice	3.continued practice	Examinations

Proficiency in
Survival Craft Course
Course Syllabus

1. SURVIVAL CRAFT AND CONTENTS

- 1.1 Lists the statutory equipment in a life-boat and their correct use.
- 1.2 To check the appropriate expiry date where it needed.

2. LAUNCHING THE LIFE-BOAT

- 2.1 Describes the procedure to be followed from launching a life-boat safely into the water.
- 2.2 Starting the engine of a life-boat. Procedure and necessary checks.
- 2.3 Describes the davits, their parts, the various locks, safety pins and their maintenance.

3. HANDLING SURVIVAL CRAFT

- 3.1 Demonstrates ability to supervise a survival craft, its launching party giving the correct orders.
- 3.2 Clears a life-boat from the ship's side under oars and under power.
- 3.3 Coxes a life-boat under oars.
- 3.4 Operates a life-boat under power, procedure of starting the engine, running checks etc.

- 3.5 Explains the use of wave quelling oil.
- 3.6 Describes how to handle a survival craft in any rough weather and when to use the sea-anchor.
- 3.7 Handles a life boat in a stream or in a tideway
- 3.8 Describes how to beach a survival craft in surf and then how to disenbark.
- 3.9 Lists the Coastguard's signals used when the boat is beaching.
- 3.10 Demonstrates ability to use a lifeboat compass to steer on a course.
- 3.11 Details the procedure when riging to a sea-anchor.

4. SHIPBOARD ARRANGEMENTS

- 4.1 Produces plans of boat-deck, Layout of life boats and life-rafts, indicating the principal dimensions and the essential details.
- 4.2 Describes in detail a boat drill muster and a full boat drill giving the relevant orders on the right time to the right person.
- 4.3 Recognises the need for maintenance of the discipline.
- 4.4 Describes the emergency situation on board any ship in the event of :
 - .1 Collision
 - .2 Fire
 - .3 Foundering.
- 4.5 Explains the need for familiarization in planning the muster list.
- 4.6 States that personnel on joining a ship should acquire as soon as possible knowledge of:
 - .1 meaning of emergency signals,
 - .2 instructions on the muster list and their duty

- .3 location and use of life-saving equipment,
 - .4 location and use of fire-fighting equipment,
 - .5 escape routes and equipment,
 - .6 emergencies involving the sinking of the ship,
 - .7 means provided for survival on ship and on survival craft,
- 4.7 Describes extra equipment which is to be taken from a ship to the survival craft if time permits and by whom,
- 4.8 Explains complications in abandoning ship due to :
- .1 some of the survival crafts not being capable to be launched,
 - .2 absence of lighting and
 - .3 absence of personnel assigned to certain duties

5. HELICOPTER ASSISTANCE

- 5.1 Communicating with the helicopter:
- .1 explains the "hand and arm" signals used for guiding the pilot
 - .2 explains how to communicate with the helicopter when the appropriate equipment is available.
- 5.2 Evacuation from ship and from a survival craft.
- .1 explains the need to have a pick-up space on the ship which has to be clear of any masts and rigging or other impediments.
 - .2 describes the means for evacuation from a life-boat or a life-raft.
- 5.3 Helicopter pick-up.
- .1 describes methods of picking-up by harness, stretcher or rescue net.
 - .2 describes the importance of obedience to any instruction given by the helicopter pilot or

deputy.

- 5.4 Correct use of the helicopter harness. Description and demonstration.

6. OPERATING SURVIVAL RADIO EQUIPMENT

- 6.1 Radiotelegraph installation for life-boats.
- .1 states for passenger ships how many life-boats are fitted with a radiotelegraph installation.
 - .2 describes contents of lid.
 - .3 understands the use of the "test link".
 - .4 describes layout of set.
 - .5 understands what and how the set "transmits and receives".
 - .6 demonstrates how to tune the set on 2185 KHz.
 - .7 demonstrates how to tune the set on 500 KHz.
 - .8 demonstrates how to tune the set on 8364 KHz.
 - .9 demonstrates how to earth the set.
 - .10 demonstrates how to rig the aerials at a maximum practicable height.
 - .11 demonstrates the use of keying devices for the transmission of: alarm and distress signals.
 - .12 demonstrates how to recharge the batteries.
 - .13 understands how to use the automatic alarm on 2182 KHz.
 - .14 understands how to use the automatic alarm on 500 KHz.

7. PORTABLE RADIO APPARATUS FOR SURVIVAL CRAFT

- 7.1 Number of radio apparatus required.
- 7.2 Place of storage
- 7.3 Demonstration of the use of keying device for transmitting alarm and distress signals.

- 7.4 Demonstrates how to recharge the batteries.
- 7.5 Demonstrates how to support the antenna at its maximum practicable height.
- 7.6 Demonstrates the use of the receiver. (practice)

8. E.P.I.R.B.s

- 8.1 States the purpose.
- 8.2 Number provided and location.
- 8.3 Describes how they can be activated.

9. SEARCH AND RESCUE

- 9.1 Describes how the S.A.R. system works :
 - .1 worldwide
 - .2 around the coasts of Greece.
- 9.2 Describes the best procedure to get the best results.
- 9.3 Searching techniques and patterns.
- 9.4 Man overboard.

10. MORE INFORMATION IN SURVIVAL

- 10.1 Details the procedure for protecting the survivors from sunlight, heat or cold.
- 10.2 States how and when to use the rations.
- 10.3 Demonstrates the ability to maintain discipline and morale in survival craft .
- 10.4 The need to care about the passengers' comfort.

I.3 . Course C

Basic Fire Fighting Course

Course Outline

- 1. Introduction (00.30)**
 - 1.1 The importance of good organisation and training
 - 1.2 Basic rules when fighting fire
 - 1.3 Exposure to heat

- 2. Condition for fires. (00.20)**
(the three elements of fire and explosion. The fire triangle.)
 - 2.1 Fuel
 - 2.2 Source of ignition
 - 2.3 Oxygen
 - 2.4 The way they act on a fire

- 3. Ignition sources and fire development. (00.15)**
 - 3.1 Chemical
 - 3.2 Biological
 - 3.3 Physical

- 4. Flammable materials (00.35)**
 - 4.1 Flammability
 - 4.2 Ignition point
 - 4.3 Burning temperature
 - 4.4 Burning speed
 - 4.5 Thermal value

- 4.6 Lower flammable limit (LFL)
- 4.7 Upper flammable limit. (UFL)
- 4.8 Flammable range
- 4.9 Inerting
- 4.10 Static electricity
- 4.11 Flash point
- 4.12 Auto-ignition

- 5. Fire hazards and spread of fire. (00.15)
 - 5.1 By radiation
 - 5.2 By convection
 - 5.3 By conduction

- 6. Reactivity. (00.10)

- 7. Classification of fire and applicable extinguishing agents. (00.30)

- 8. Main causes of fire on board ships. (00.25)
 - 8.1 Oil leakage in the engine room
 - 8.2 Cigarettes
 - 8.3 Bearings' overheating.
 - 8.4 Galley appliances
 - 8.5 Spontaneous ignition
 - 8.6 Hot works
 - 8.7 Electrical apparatus
 - 8.8 Reaction, self-heating and auto-ignition

- 9. Fire prevention (00.40)
 - 9.1 Ship construction arrangement
 - 9.2 Safe practices
 - 9.3 Fire prevention principles

- 10. Fire detection (00.40)

- 10.1 Fire and smoke detection systems
- 10.2 Automatic fire-alarm

- 11. Fire fighting equipment. (02.15)
 - 11.1 Fixed installations on board and locations
 - 1.1 Fire mains, hydrants
 - 1.2 International shore connection
 - 1.3 Smothering installations, carbon dioxide (CO2) foam
 - 1.4 Halogenated hydrocarbons
 - 1.5 Pressure water spray system in special category spaces, etc.
 - 1.6 Automatic sprinkler system
 - 1.7 Emergency fire-pump, emergency generator.
 - 1.8 Chemical powder applicants
 - 1.9 General outline of required and available mobile apparatus
 - 11.2 Mobile equipment (01.30)
 - 2.1 Fire-man's outfits and personal equipment
 - 2.2 Breathing apparatus
 - 2.3 Resuscitation apparatus
 - 2.4 Smoke helmet or mask
 - 2.5 Fireproof life-line and harness
 - 11.3 General equipment (00.45)
 - 3.1 Fire hoses, nozzles, connections, fire axes.
 - 3.2 Portable fire extinguishers
 - 3.3 Fire blankets

- 12. Construction and arrangements (01.30)
 - 12.1 Escape routes
 - 12.2 Means for gas freeing tanks
 - 12.3 Class A, B and C divisions
 - 12.4 Inert gas systems

- 13. Ship fire-fighting organization (00.35)
 - 13.1 General alarm
 - 13.2 Fire control plans, muster stations and duties of individuals
 - 13.3 Communications, including ship-shore when in port
 - 13.4 Personnel safety procedures
 - 13.5 Periodic shipboard drills
 - 13.6 Patrol systems
 - 13.7 Handling casualties

- 14. Practical knowledge of resuscitation methods. (00.10)

- 15. Fire-fighting methods. (00.30)
 - 15.1 Sounding the alarm
 - 15.2 Locating and isolating
 - 15.3 Jettisoning
 - 15.4 Inhibiting
 - 15.5 Cooling
 - 15.6 Smothering
 - 15.7 Extinguishing
 - 15.8 Reflash watch

- 16. Fire-fighting agents (01.55)
 - 16.1 Water, solid jet, spray, fog, flooding
 - 16.2 Foam, high, medium and low expansion
 - 16.3 Carbon dioxide (CO₂)
 - 16.4 Halon
 - 16.5 Aqueous film forming foam (AFFF)
 - 16.6 Dry chemicals, powder

- 17. Practicing according RES.A437 (XI)
 - 17.1 To become familiar with the self-contained breathing apparatus. (01.30)

- 17.1.1 To fight fire in smoke-filled enclosed spaces wearing self-contained breathing apparatus.
 - .2 To effect a rescue from the above place still wearing the s.c.b.a.
 - .3 To enter and pass through the same compartment into which high expansion foam has been injected, with a life-line, without s.c.b.a.
- 17.2 Fire-extinguishing (01.30)
- .1 To use various types of extinguishers for putting out small fires, electrical, oil or propane. The last one will be extinguished by reaching the source's valve under the cover of water-spray.
 - .2 To use either foam, powder or any other suitable chemical agent to extinguish fires.
 - .3 To extinguish oil fire, with fog application and spray nozzles, dry chemical powder or foam applicators.
- 17.3 Extensive fires. (01.30)
- .1 To extinguish an extensive fire with water, using jet and spray nozzles or any other suitable fire-fighting agent in the simulated accommodation room with fire and heavy smoke.

**BASIC FIRE-FIGHTING COURSE
TIME TABLE**

	1st DAY	2nd DAY	3rd DAY
1st period 1.5 hours	1. Introduction 2. Condition of fires. 3. Ignition sources and fire development. 4. Flammable materials	11.1 Fixed installations. 11.2 Mobile equipment. 11.3 General equipment.	13. Ship organization. 15. Fire-fighting methods. 16. Fire-fighting agents.
2nd period 1.5 hours	4. continued. 5. Fire hazard spread of fire. 6. Reactivity. 7. Classification of fire. 8. Main causes of fire onboard	11.1 11.2 11.3 continued	13. 15. 16. continued
3rd period 1.5 hours	9. Fire prevention and 10. detection 14. Practical knowledge of resuscitation methods.	11.1 11.2 11.3 continued	17.2 (practice) Fire extinguishing
4th period 1.5 hr	12. Construction and arrangements.	17.1 (practice) Breathing apparatus.	17.3 (practice) Extensive fire extinguishing.

Basic Fire Fighting Course

Course Syllabus

1.- INTRODUCTION

- 1.1 States the importance of good organization and training of the crew.
- 1.2 States the basic actions when fighting the fire
 - .1 Alarm - control - attack - support.
 - .2 Ventilation control.
 - .3 Evacuation - emergency stops.
 - .4 Use of fixed installations.
- 1.3 States principles of survival when fighting the fire.
 - .1 Exposure to heat.
 - .2 Sweating - humidity.
 - .3 Effects of heat: heat syncope, stroke exhaustion
 - .4 Recommended precautions.
 - .5 Escape routes
 - .6 Smoke and toxic fume dangers.

2.- CONDITIONS FOR FIRES.

The three elements of fire and explosion.

- 2.1 Lists conditions required for fire to occur as:
 - .1 Presence of material which act as a fuel.
 - .2 source of ignition, e.g. chemical, biological, and physical.
 - 2.1.3 Presence of oxygen.
- 2.2 Sketches how these three conditions mentioned above can be represented as a triangle known as the fire-triangle.
- 2.3 Sketches how the addition of "chain reaction" forming a square, represents a continuous burn-

ing fire.

- 2.4 Explains the change of the triangle into a tetrahedron.

3.- IGNITION SOURCES AND FIRE DEVELOPMENT

- Lists four phases of fire development as:
- Ignition (incipient)
- Developing (surface fire)
- Absolute fire (fire in depth in solids)
- Burning out.

4.- FLAMMABLE MATERIALS

4.1 Defines the following:

- Flammability
- Ignition point
- Burning temperature
- Burning speed
- Thermal value
- Lower flammable limit (LFL)
- Upper flammable limit (UFL)
- Flammable range
- Flashpoint
- Inerting
- Static electricity
- Auto-ignition point.

4.2 Gives an example of how static electricity can occur.

5.- FIRE HAZARD AND SPREAD OF FIRE.

5.1 Defines:

- .1 Conduction
- .2 Radiation
- .3 Heat flow
- .4 Convection currents and how these can help the

fire to spread over.

- .5 States that spread of fire occurs as a result of equalisation in temperature between fire and surroundings via the above mentioned ways.

6.- REACTIVITY

Explains some basic details about reactivity.

7.- CLASSIFICATION OF FIRE AND APPLICABLE EXTINGUISHING AGENTS

Lists classification letter and appropriate extinguishing agents for fires in the following substances:

- .1 Wood, paper, textiles and similar materials.
- .2 Same as above and flammable liquids.
- .3 Flammable liquids, electrical equipment, flammable gases.
- .4 Wood, paper, textiles, flammable liquids, electrical equipment and flammable gases.
- .5 Combustible metals.
- .6 Flammable liquids, electrical equipment, flammable gases.

8.- MAIN CAUSES OF FIRE ON BOARD SHIPS.

8.1 Lists fire hazards in the engine room including:

- .1 Combustible liquids as fuel and lubricants.
- .2 Oil leaks and oil-soaked insulation.
- .3 Defects in lagging.
- .4 Auto-ignition e. g. dripping on hot surfaces.

8.2 Lists hazards from smokers and cigarettes including:

- .1 Temperature of a burning cigarette is 500 D. C
- .2 Carelessness with cigarettes and matches set-

- ting fire to bedclothes, waste paper in a bin contents and furnishings.
- 8.3 Hot surfaces, e.g. exhaust pipes, various engine parts such as overheated bearings.
- 8.4 Lists hazards in galley including:
- .1 Combustible liquids e. g. cooking oil and hot fat.
 - .2 Hot surfaces e.g. ovens, frying pans and flues
- 8.5 Lists hazards from cargoes including:
- .1 Self-heating cargoes & spontaneous combustion
 - .2 Oxidising cargoes and organic peroxides.
 - .3 Compressed flammable gas.
 - .4 Pyroforic cargoes
 - .5 Explosives.
- 8.6 Hot works such as: welding, cutting by oxy-acetylene torch e.t.c.
- 8.7 Defective electrical connections, old electrical apparatus, short circuits and non-professional repairs.
- 8.8 Describes the way some materials react with others and specially with the water. Self-heat increase and auto-ignition.

9.- FIRE PREVENTION

- 9.1 Ship construction arrangements
- .1 Lists the basic principles.
 - .2 States how escape routes are protected.
 - .3 Describes Class A, B, and C divisions.
 - .4 Lists means for gas-freeing tanks.
 - .5 Describes the purpose of and means for inerting cargo spaces.
 - .6 Explains briefly fire prevention arrangements required in cargo spaces.
- 9.2 A Lists general safety procedures including:

- .1 No smoking in hazardous areas.
 - .2 Ability to raise fire alarm quickly.
 - .3 Ability to extinguish fire by using portable extinguishers and other methods.
 - .4 Ability to recognize fire hazards and take the necessary steps to prevent fires.
- B Lists for engine room means for reducing fire-hazards which include:
- .1 Ensuring insulation and lagging are kept in good condition.
 - .2 Eliminating oil leaks and preventing accumulation of oil.
 - .3 Taking proper fire precautions when welding or burning is carried out.
 - .4 Checking that caps and cocks for sounding pipes to oil tanks are closed.
 - .5 Maintaining a clean engine room, removing oil-soaked rags.
- C Lists for galley, means for reducing fire hazards, which include:
- .1 Keeping extraction fan flues clean.
 - .2 Ensuring soaking oils do not spill on top of the stove or overheat in electrical cooking pans.
 - .3 Keeping electrical installation well maintained.
- D Lists for accommodation, means for securing fire hazards, which include:
- .1 No smoking in bed.
 - .2 No unauthorized electrical fittings.
 - .3 No emptying of any ash trays into waste paper bins without ensuring all cigarette ends are extinguished.
- E Lists for cargo spaces, means for reducing

fire hazards which include:

- .1 Ensuring hatches are correctly cleaned.
 - .2 Ensuring cargo is stowed and ventilated in accordance with the rules.
 - .3 Prohibition of smoking during cargo working periods.
 - .4 Securing of cargo.
 - .5 Inerting of the atmosphere in cargo compartments when required.
- 9.3 Fire prevention principles.
- .1 Describing how to use the "fire triangle" and "fire square" concept to prevent and extinguish fires.
 - .2 Giving examples of how a fire can be prevented from spreading by reducing or blocking:
 - conduction
 - radiation
 - heat flow
 - convection currents.

10.- FIRE DETECTION

10.1 Fire and smoke detection systems

- .1 Describes the construction of an automatic fire detection system.
- .2 States the main types of automatic fire detectors.
- .3 Describes the characteristics of each main type of smoke detector:
 - heat (or rate of rise) detectors
 - smoke, optical and ionization type and
 - flame detectors.
- .4 Lists the alarms or actions which may be activated by a detector.
- .5 States the benefits of an automatic sprinkler

in regard to fire detection.

- .6 States which detection system pertains to:
 - cargo spaces
 - engine room and other machinery spaces
 - accommodation
 - bridge and other control rooms and
 - galley

10.2 Automatic fire alarm

- .1 Describes the operation of an automatic alarm
- .2 Describes a system which has fire zones and states where such a system may be installed in a ship.
- .3 Describes the benefit of a zoned system.

11.- FIRE-FIGHTING EQUIPMENT.

11.1 Fixed installations on board and locations.

.1 Fire mains and hydrants.

- .1 States the requirements for the numbers and positions of hydrants.
- .2 States the reason for fitting a shut-off valve each hose.
- .3 States the reason for fitting isolating valves on the fire main.

11.1.2 Describes an international shore connection with principal dimensions given and states its purpose.

- .1 Describes how it is connected.
- .2 States minimum number of these connections which have to be carried.

11.1.3 Smothering installations: carbon dioxide and foams.

- .1 Explains how CO₂ smothers a fire.
- .2 States the dangers of the carbon dioxide.
- .3 States in which spaces can be used.

- .4 Explains the action of foam on a fire.
- .5 Describes the actions taken before CO2 or foam are released into the fire zone.
- .6 Describes the different types of foam.
- 11.1.4 Halogenated hydrocarbons.
 - .1 Halon as extinguishing agent.
 - .2 The most well known, 1301, and 1211.
 - .3 Chemical composition.
 - .4 Simple chemistry of how halon extinguish a fire.
 - .5 Simple estimation of halon quantity required
 - .6 States dangers of halon.
 - .7 States actions to be taken when halon alarm sounds.
 - .8 Lists the spaces in which halon may be used.
 - .9 States on which types of fire halon is used.
- 11.1.5 Pressure water spray system in special category spaces, e.t.c.
 - .1 Gives information and diagrams.
 - .2 Special installations in passenger ships.
 - .3 Defines special category spaces in which some pressure water spray systems are normally used.
- 11.1.6 Explains how the sprinkler system is working
 - .1 States in which spaces the sprinkler is used
- 11.1.7 Emergency fire-pump and emergency generator.
 - .1 States the number of acceptable jets of water which the emergency fire pump must be capable of supplying.
 - .2 States the requirements for the location of this pump.
 - .3 States the circumstances under which the emergency fire pump and the emergency generator are used.

- 11.1.8 Chemical powder applicants.
 - .1 Describes typical fixed powder apparatus with each container holding 250 kgs powder.
 - .2 Explains how this equipment is used for best results.
- 11.1.9 General outline of required and available mobile apparatus.
 - .1 lists mobile apparatus available including:
 - carbon dioxide cylinders
 - powder containers with propellant gas.
 - foam-making equipment.
 - .2 Emphasis has to be given on "what type of fire-extinguisher" must be used for every kind of fire.
 - .3 Dangers when this rule is not followed.
- 11.2 Mobile equipment.
 - .1 Fireman's outfit, personal equipment and location on board a ship.
 - .1 Lists the constituents of a fireman's outfit in three sections as:
 - Personal equipment
 - Breathing apparatus
 - Fireproof life-line with snaphook and harness.
 - .2 Lists the two main types of breathing apparatus which may be used.
 - .3 Lists advantages and disadvantages relative to each other.
 - .4 States the requirements for the fire-line.
 - .5 States the minimum number of fireman's outfits which must be carried on all ships.
 - 11.2.2 Breathing apparatus
 - .1 Describes a self-contained compressed air operated breathing apparatus.

- .2 Demonstrates how to dismantle and reassemble a CABA.
- .3 Describes and demonstrates how to service it
- .4 Demonstrates the correct way to fit the face mask of a CABA and check its air-tightness.
- .5 Lists the checks which must be made on this equipment before it is used and after it has been strapped on.
- .6 Demonstrates the correct breathing technique to give a low air consumption for a particular exertion when using a CABA.
- .7 Explains "dead volume" and its effect on air consumption on the CABA.
- .8 Explains the reasons for not remaining in a toxic atmosphere until the CABA air bottles are empty.
- .9 Explains action which must be taken when the warning signal is given on a CABA that air pressure is low.
- .10 Describes a breathing apparatus having smoke helmet, air pump, air-line and fittings.

11.2.3 Resuscitation apparatus

- .1 Description
- .2 Demonstrates how it is used to revive a person affected by smoke.
- .3 Explains how the use of this equipment may reduce the CABA wearer's endurance time in a smoke filled space.
- .4 Demonstrates other resuscitation techniques.

NOTE: All the above may not be delivered to the trainees, as they will attend the special "first aid course", where they will have the opportunity to receive more detailed

information about this paragraph.

- 11.2.4 Smoke helmet or mask's demonstration.
- 11.2.5 Practicing on the life-line and its harness.
- 11.3 General equipment.
 - .1 Fire hoses, nozzles, connections, fire axes.
 - .1 States briefly the regulations concerning fire hoses and nozzles.
 - .2 Explains how hoses are joined together and connected to fire hydrants.
 - .3 Explains how a nozzle can be adjusted to produce a concentrated jet, a spray or a mist and for which purpose each is used.
 - .4 Explains how to take care of hoses & nozzles
 - 11.3.2 Portable fire extinguishers.
 - .1 Lists the different types of portable extinguishers such as:
 - water
 - foam
 - powder
 - carbon dioxide
 - halon
 - .2 Describes the operational principle of each type of extinguisher.
 - .3 States the normal capacity of each type.
 - .4 Explains the procedures for having empty extinguishers recharged.
 - .5 Describes a portable foam applicator and how it is connected to the fire main.
 - .6 States the normal capacity of such an applicator.
 - 11.3.3 Fire blankets.
 - .1 Describes a fire-blanket.
 - .2 Demonstrates how to use it.

.3 States where they are normally located.

12.- CONSTRUCTION AND ARRANGEMENTS

12.1 Explains and describes:

- .1 Bulkheads within the accommodation
- .2 Fire integrity of bulkheads and decks.
- .3 Means of escape.
- .4 How the stairways and lift trunks are protected.
- .5 Doors and fire-resisting divisions.
- .2 Arrangements as:
 - .1 Ventilation
 - .2 Fixed fire detection system.
 - .3 Fire protection in cargo spaces.
- .3 Explains the divisions A, B, and C.
Ships carrying danger goods.
- .4 Inert gas system.
 - .1 From the old "inert gas producers" to the modern "funnel gas inert systems". Describe.
 - .2 Diagrams.
 - .3 Theory and practice.

13.- SHIP FIRE-FIGHTING ORGANISATION

13.1 General emergency alarm.

- .1 Describes this signal as consisting of seven or more short blasts followed by one long on the ship's whistle and bells or klaxons or any equivalent sounding elsewhere in the ship.
- .2 Describes the purpose of the special alarm operated from the navigating bridge to summon the crew to the fire stations.
- .3 States the location and use of the fire alarms and the emergency controls.

13.2 Fire control plans, muster lists and duties of the individuals.

- .1 Describes fire control plans and where they are located.
- .2 Describes a muster list.
- .3 Gives examples of duties of individual crew members.

13.3 Communications

- .1 Describes methods of communications used during a fire emergency as:
 - messengers
 - telephones
 - walkie-talkies
 - ship to shore V.H.F.
 - use of the public address system.

13.4 Personnel safety procedures

- .1 Describes how a fire-fighting team is made up and states who is in charge.
- .2 States that the fire zone may not be entered unless orders to do so have been given by the person in charge.
- .3 States the need to be familiar with the area of fire zone and escape routes
- .4 States the need to be properly equipped to enter a fire zone, especially if the lights have failed and space is full of smoke.
- .5 States how everyone has to be dressed.
- .6 States how important is to know the proper use of the fire fighting equipment and to be away of any potential fire hazards.
- .7 Lists what equipment is required including:
 - breathing apparatus
 - hand lantern
 - axe

- fire proof life-line with fittings.
 - .8 Explains how to use the life-line for signaling.
 - .9 States the need to be flexible to allow for vacancies in the necessary fire parties.
- 13.5 Periodic shipboard drills
- .1 States the purpose of these drills.
 - .2 Describes typical exercises for use during fire drills such as:
 - Extinguishing a fire in a deep fryer.
 - Entering a closed room on fire.
 - Extinguishing a major deck fire.
 - Rescuing an unconscious person from a smoke filled space.
- 13.6 Patrol systems
- .1 States that on ships having more than 36 passengers an efficient patrol system must be maintained.
 - .2 Lists the duties of the patrol.
- 13.7 Handling the casualties.
- .1 Measures which had to be taken when entering a dangerous (unter fire or smoke) space for saving an unconscious person.
 - .2 Gas-freeing state. Special notice for tanker.

14.- PRACTICAL KNOWLEDGE OF RESUSCITATION METHODS.

- 14.1 Using the special units.
- 14.2 Mouth to mouth and Sylvester's method.

15.- FIRE FIGHTING METHODS

- 15.1 Sounding the alarm and first actions.
 - .1 To distinguish the fire alarm from other signals.
 - .2 States as actions on discovering a fire.

- activate alarm
 - if possible remove cause of fire
 - if possible restrict ventilation
- 15.2 Locating and isolating.
Understands that these two must be his first actions.
- 15.3 Jettisoning.
States the necessity of jettisoning when it is easy and possible.
- 15.4 Inhibiting.
The most important action is not to permit a fire to spread.
- 15.5 Cooling.
Understands the importance of lowering the temperature of the burning "fuel".
- 15.6 Smothering.
States all the ways of smothering the fire by any means: steam, CO2, funnel gas etc.
- 15.7 Extinguishing.
The main effort. Dangers.
- 15.8 Reflash watch.
The necessity of watching the area where a fire has been just extinguishing.

16.- FIRE-FIGHTING AGENTS

- 16.1 Water, solid jet, spray, fog, flooding.
Explains how, where and when the above agents can offer very satisfactory results.
- 16.2 High, medium and low expansion foam.
More details for the way foam is acting.
- 16.3 Carbon dioxide. CO2
- .1 How to use and how it works on the fire. Dangers when using them. Evacuation.
 - .2 Portable extinguishers.

16.4 Halon

- .1 Describes halon 1211 and halon 1301 and their grades.
- .2 Advantages.
- .3 Mechanism of extinguishing the fire.
- .4 Applications.

16.5 Aqueous film forming foam.

States the way it is used.

16.6 Dry chemicals, powder.

In what condition they can be found on a ship and how and where they can be used.

I.4 Course D

Fire Fighting Course

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- 1. Introduction (00.30)**
 - 1.1 The importance of good organisation and training
 - 1.2 Basic rules when fighting the fire
 - 1.3 Exposure to heat

- 2. Condition for fires. (00.20)**
(the three elements of fire and explosion. The fire triangle.)
 - 2.1 Fuel
 - 2.2 Source of ignition
 - 2.3 Oxygen
 - 2.4 The way they act on a fire

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 - 3.1 Chemical
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 - 4.1 Flammability
 - 4.2 Ignition point
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 - 4.4 Burning speed
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 - 4.6 Lower flammable limit (LFL)

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- 4.8 Flammable range
- 4.9 Inerting
- 4.10 Static electricity
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- 4.12 Auto-ignition

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 - 5.1 By radiation
 - 5.2 By convection
 - 5.3 By conduction

- 6. Reactivity. (00.10)

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 - 8.1 Oil leakage in engine room
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 - 1.8 Chemical powder applicants
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 - 14.8 Reflash watch

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 - 15.1 Water, solid jet, spray, fog, flooding
 - 15.2 Foam, high, medium and low expansion
 - 15.3 Carbon dioxide (CO₂)
 - 15.4 Halon
 - 15.5 Aqueous film forming foam (AFFF)
 - 15.6 Dry chemicals, powder

- 16. Practicing according RES.A437 (XI)
 - 16.1 Demonstrates how the self-contained breathing apparatus is working and how the bottles can be refilled. (00.20)
 - 16.2 To be familiar with the s.c.b.a. To be able to

dis-assemble and re-assemble the apparatus and to be also familiar with how the air-compressor is working and how it can be used for refilling the bottles.

To know how to check the proper performance of the apparatus.

Basic maintenance procedures. (01.30)

16.3 Fire extinguishing.

.1 To use various types of portable fire extinguishers for putting out small fires, electrical or oil.

.2 To use either foam, powder or any other suitable chemical agent to extinguish fires. (01.30)

16.4 Extensive fires.

To extinguish an extensive fire with water, using jet and spray nozzles under spray protection in the "triedron". (03.00)

16.5 Smoke fighting.

.1 To fight fire in smoke-filled enclosed spaces wearing s.c.b.a.

.2 To effect a rescue from the above place still wearing the s.c.b.a. (01.30)

16.6 Foam practice.

.1 To demonstrate how effective the use of a fixed high expansion foam system can be in a closed space. For this purpose the simulated accommodation will be used.

.2 To enter and pass through the above compartment where the foam has been injected with life line thus without breathing apparatus.

(01.30)

16.7 Examinations

(01.30)

**FIRE - FIGHTING COURSE
TIME - TABLE**

1st DAY	2nd DAY	3rd DAY	4th DAY
1. Introduction 1st prd 1.5 hrs	11.1 Fixed installations 11.2 Mobile equipment 11.3 General equipment.	13. Ship orga- nisation 14. Fire figh- -ting methods 15. Fire figh- -ting agents.	16.4 cont. using other fire fight- ing agents.
4. Flammable materials.	11.1 11.2 11.3	13. 14. 15.	16.5 Smoke fighting.
4. continued 2nd prd 1.5 hrs	5. Fire hazard 6. Reactivity. 7. Fire clas- sification 8. Causes of fire aboard.	continued continued	
9. Fire preven- tion and 10. Detection 16.1 Breathing apparatus.	11.1 11.2 11.3 continued	16.3 Practice portable ext. with small fires.	16.6.1 and 16.6.2 The foam and its use. (practice)
L U N C H			
12. Construc- tion and arrangements. 4th prd 1.5 hrs	16.2 Practice on the brea- -thing appa- -ratus.	16.4 Fighting extensive fi- res with foam and water.	16.7 Exams.

Fire Fighting Course

Course Syllabus

1.- INTRODUCTION

- 1.1 States the importance of good organization and training of the crew.
- 1.2 States the basic actions when fighting the fire
 - .1 Alarm - control - attack - support.
 - .2 Ventilation control.
 - .3 Evacuation - emergency stops.
 - .4 Use of fixed installations.
- 1.3 States principles of survival when fighting the fire.
 - .1 Exposure to heat.
 - .2 Sweating - humidity.
 - .3 Effects of heat: heat syncope, stroke exhaustion
 - .4 Recommended precautions.
 - .5 Escape routes
 - .6 Smoke and toxic fume dangers.

2.- CONDITIONS FOR FIRES.

The three elements of fire and explosion.

- 2.1 Lists conditions required for fire to occur as:
 - .1 Presence of material which act as a fuel.
 - .2 source of ignition e. g. chemical, biological, and physical.
- 2.1.3 Presence of oxygen.
- 2.2 Sketches how these three conditions mentioned above can be represented as a triangle known as the fire-triangle.
- 2.3 Sketches how the addition of "chain reaction" forming a square, represents a continuous burn-

ing fire.

- 2.4 Explains the change of the triangle into a tetrahedron.

3.- IGNITION SOURCES AND FIRE DEVELOPMENT

- Lists four phases of fire development as:
- Ignition (incipient)
- Developing (surface fire)
- Absolute fire (fire in depth in solids)
- Burning out.

4.- FLAMMABLE MATERIALS

- 4.1 Defines the following:
- Flammability
 - Ignition point
 - Burning temperature
 - Burning speed
 - Thermal value
 - Lower flammable limit (LFL)
 - Upper flammable limit (UFL)
 - Flammable range
 - Flashpoint
 - Inerting
 - Static electricity
 - Auto-ignition point.
- 4.2 Gives an example of how static electricity can occur.

5.- FIRE HAZARD AND SPREAD OF FIRE.

- 5.1 Defines:
- .1 Conduction
 - .2 Radiation
 - .3 Heat flow
 - .4 Convection currents and how these can help the

fire to spread over.

- .5 States that spread of fire occurs as a result of equalisation in temperature between fire and surroundings via the above mentioned ways.

6.- REACTIVITY

Explains some basic details about reactivity.

7.- CLASSIFICATION OF FIRE AND APPLICABLE EXTINGUISHING AGENTS

Lists classification letter and appropriate extinguishing agents for fires in the following substances:

- .1 Wood, paper, textiles and similar materials.
- .2 Same as above and flammable liquids.
- .3 Flammable liquids, electrical equipment, flammable gases.
- .4 Wood, paper, textiles, flammable liquids, electrical equipment and flammable gases.
- .5 Combustible metals.
- .6 Flammable liquids, electrical equipment, flammable gases.

8.- MAIN CAUSES OF FIRE ON BOARD SHIPS.

8.1 Lists fire hazards in the engine room including :

- .1 Combustible liquids as fuel and lubricants.
- .2 Oil leaks and oil-soaked insulation.
- .3 Defects in lagging.
- .4 Auto-ignition e.g. dripping on hot surfaces.

8.2 Lists hazards from smokers and cigarettes including:

- .1 Temperature of a burning cigarette is 500 D. C
- .2 Carelessness with cigarettes and matches set-

- ting fire to bedclothes, waste paper in a bin contents and furnishings.
- 8.3 Hot surfaces e. g. exhaust pipes, various engine parts such as overheated bearings.
- 8.4 Lists hazards in galley including:
- .1 Combustible liquids e. g. cooking oil and hot fat.
 - .2 Hot surface e.g. ovens, frying pans and flues
- 8.5 Lists hazards from cargoes including:
- .1 Self-heating cargoes & spontaneous combustion
 - .2 Oxidising cargoes and organic peroxides.
 - .3 Compressed flammable gas.
 - .4 Pyroforic cargoes
 - .5 Explosives.
- 8.6 Hot works such as: welding, cutting by oxy-acetylene torch etc.
- 8.7 Defective electrical connections, old electrical apparatus, short circuits and non-professional repairs.
- 8.8 Describes the way some materials react with others and specially with the water. Self-heat increase and auto-ignition.

9.- FIRE PREVENTION

- 9.1 Ship construction arrangements
- .1 Lists the basic principles.
 - .2 States how escape routes are protected.
 - .3 Describes Class A, B, and C divisions.
 - .4 Lists means for gas-freeing tanks.
 - .5 Describes the purpose of and means for inerting cargo spaces.
 - .6 Explains briefly fire prevention arrangements required in cargo spaces.
- 9.2 A Lists general safety procedures including:

- .1 No smoking in hazardous areas.
 - .2 Ability to raise fire alarm quickly.
 - .3 Ability to extinguish fire by using portable extinguishers and other methods.
 - .4 Ability to recognize fire hazards and take the necessary steps to prevent fires.
- B Lists for engine room means for reducing fire-hazards which include:
- .1 Ensuring insulation and lagging are kept in good condition.
 - .2 Eliminating oil leaks and preventing accumulation of oil.
 - .3 Taking proper fire precautions when welding or burning is carried out.
 - .4 Checking that caps and cocks for sounding pipes to oil tanks are closed.
 - .5 Maintaining a clean engine room, removing oil-soaked rags.
- C Lists for galley means for reducing fire hazards which include:
- .1 Keeping extraction fan flues clean.
 - .2 Ensuring soaking oils do not spill on top of the stove or overheat in electrical cooking pans.
 - .3 Keeping electrical installation well maintained.
- D Lists for accommodation means for securing fire hazards which include:
- .1 No smoking in bed.
 - .2 No unauthorized electrical fittings.
 - .3 No emptying of any ash trays into waste paper bins without ensuring all cigarette ends are extinguished.
- E Lists for cargo space means for reducing fire

hazards which include:

- .1 Ensuring hatches are correctly cleaned.
- .2 Ensuring cargo is stowed and ventilated in accordance with the rules.
- .3 Prohibition of smoking during cargo working periods.
- .4 Securing of cargo.
- .5 Inerting of the atmosphere in cargo compartments when required.

9.3 Fire prevention principles.

- .1 Describes how to use the "fire triangle" and "fire square" concept to prevent and extinguish fires.
- .2 Gives examples of how a fire can be prevented from spreading by reducing or blocking:
 - conduction
 - radiation
 - heat flow
 - convection currents.

10.- FIRE DETECTION

10.1 Fire and smoke detection systems

- .1 Describes the construction of an automatic fire detection system.
- .2 States the main types of automatic fire detectors.
- .3 Describes the characteristics of each main type of smoke detector:
 - heat (or rate of rise) detectors
 - smoke, optical and ionization type and
 - flame detectors.
- .4 Lists the alarms or actions which may be activated by a detector.
- .5 States the benefits of an automatic sprinkler

in regard to fire detection.

- .6 States which detection system pertains to:
 - cargo spaces
 - engine room and other machinery spaces
 - accommodation
 - bridge and other control rooms and
 - galley

10.2 Automatic fire alarm

- .1 Describes the operation of an automatic alarm
- .2 Describes a system which has fire zones and states where such a system may be installed in a ship.
- .3 Describes the benefit of a zoned system.

11.- FIRE-FIGHTING EQUIPMENT.

11.1 Fixed installations on board and locations.

- .1 Fire mains and hydrands.
 - .1 States the requirements for the numbers and positions of hydrants.
 - .2 States the reason for fitting a shut-off valve each hose.
 - .3 States the reason for fitting isolating valves on the fire main.

11.1.2 Describes an international shore connection with principal dimensions given and states its purpose.

- .1 Describes how it is connected.
- .2 States minimum number of these connections which have to be carried.

11.1.3 Smothering installations: carbon dioxide and foams.

- .1 Explains how CO₂ smothers a fire.
- .2 States the dangers of the carbon dioxide.
- .3 States in which spaces can be used.

- .4 Explains the action of foam on a fire.
- .5 Describes the actions taken before CO2 or foam are released into the fire zone.
- .6 Describes the different types of foam.
- 11.1.4 Halogenated hydrocarbons.
 - .1 Halon as extinguishing agent.
 - .2 The most well known, 1301 and 1211.
 - .3 Chemical composition.
 - .4 Simple chemistry of how halon extinguishes a fire.
 - .5 Simple estimation of halon quantity required
 - .6 States dangers of halon.
 - .7 States actions to be taken when halon alarm sounds.
 - .8 Lists the spaces in which halon may be used.
 - .9 States on which types of fire halon is used.
- 11.1.5 Pressure water spray system in special category spaces, e.t.c.
 - .1 Gives information and diagrams.
 - .2 Special installations in passenger ships.
 - .3 Defines special category spaces in which some pressure water spray systems are normally used.
- 11.1.6 Explains how the sprinkler system is working
 - .1 States in which spaces the sprinkler is used
- 11.1.7 Emergency fire-pump and emergency generator.
 - .1 States the number of acceptable jets of water which the emergency fire pump must be capable of supplying.
 - .2 States the requirements for the location of this pump.
 - .3 States the circumstances under which the emergency fire pump and the emergency gene-

rator are used.

11.1.8 Chemical powder applicants.

- .1 Describes typical fixed powder apparatus with each container holding 250 kgs powder.
- .2 Explains how this equipment is used for best results.

11.1.9 General outline of required and available mobile apparatus.

- .1 lists mobile apparatus available including:
 - carbon dioxide cylinders
 - powder containers with propellant gas.
 - foam producing equipment.
- .2 Emphasis has to be given on "what type of fire-extinguisher" must be used for every kind of fire.
- .3 Dangers when this rule is not followed.

11.2 Mobile equipment.

- .1 Fireman's outfit, personal equipment and location on board a ship.
 - .1 Lists the constituents of a fireman's outfit in three sections as:
 - Personal equipment
 - Breathing apparatus
 - Fireproof life-line with snaphook and harness.
 - .2 Lists the two main types of breathing apparatus which may be used.
 - .3 Lists advantages and disadvantages relative to each other.
 - .4 States the requirements for the fire-line.
 - .5 States the minimum number of fireman's outfits which must be carried on all ships.

11.2.2 Breathing apparatus

- .1 Describes a self-contained compressed air

operated breathing apparatus.

- .2 Demonstrates how to dismantle and reassemble a CABA.
- .3 Describes and demonstrates how to service it
- .4 Demonstrates the correct way to fit the face mask of a CABA and check its air-tightness.
- .5 Lists the checks which must be made on this equipment before it is used and after it has been strapped on.
- .6 Demonstrates the correct breathing technique to give a low air consumption for a particular exertion when using a CABA.
- .7 Explains "dead volume" and its effect on air consumption on the CABA.
- .8 Explains the reasons for not remaining in a toxic atmosphere until the CABA air bottles are empty.
- .9 Explains action which must be taken when the warning signal is given on a CABA when the air-pressure is low.
- .10 Describes a breathing apparatus having smoke helmet, air pump, air-line and fittings.

11.2.3 Resuscitation apparatus

- .1 Description
- .2 Demonstrates how it is used to revive a person affected by smoke.
- .3 Explains how the use of this equipment may reduce the CABA wearer's endurance time in a smoke filled space.
- .4 Demonstrates other resuscitation techniques.

NOTE: All the above may not be delivered to the trainees, as they will attend the special "first aid course", where they will have

the opportunity to receive more detailed information about this paragraph.

- 11.2.4 Smoke helmet or mask's demonstration.
- 11.2.5 Practicing on the life-line and its harness.
- 11.3 General equipment.
 - .1 Fire hoses, nozzles, connections, fire axes.
 - .1 States briefly the regulations concerning fire hoses and nozzles.
 - .2 Explains how hoses are joined together and connected to fire hydrants.
 - .3 Explains how a nozzle can be adjusted to produce a concentrated jet, a spray or a mist and for which purpose each is used.
 - .4 Explains how to take care of hoses & nozzles
 - 11.3.2 Portable fire extinguishers.
 - .1 Lists the different types of portable extinguishers such as:
 - water
 - foam
 - powder
 - carbon dioxide
 - halon
 - .2 Describes the operational principle of each type of extinguisher.
 - .3 States the normal capacity of each type.
 - .4 Explains the procedures for having empty extinguishers recharged.
 - .5 Describes a portable foam applicator and how it is connected to the fire main.
 - .6 States the normal capacity of such an applicator.
 - 11.3.3 Fire blankets.
 - .1 Describes a fire-blanket.
 - .2 Demonstrates how to use it.

- .3 States where they are normally located.

12.- CONSTRUCTION AND ARRANGEMENTS

12.1 Explains and describes:

- .1 Bulkheads within the accommodation
 - .2 Fire integrity of bulkheads and decks.
 - .3 Means of escape.
 - .4 How the stairways and lift trunks are protected.
 - .5 Doors and fire-resisting divisions.
- ### **.2 Arrangements as:**
- .1 Ventilation
 - .2 Fixed fire detection system.
 - .3 Fire protection in cargo spaces.
- ### **.3 Explains the divisions A, B, and C.**
- Ships carrying danger goods.
- ### **.4 Inert gas system.**
- .1 From the old "inert gas producers" to the modern "funnel gas inert systems". Describe.
 - .2 Diagrams.
 - .3 Theory and practice.

13.- SHIP FIRE-FIGHTING ORGANISATION

13.1 General emergency alarm.

- .1 Describes this signal as consisting of seven or more short blasts followed by one long on the ship's whistle and bells or klaxons or any equivalent sounding elsewhere in the ship.
- .2 Describes the purpose of the special alarm operated from the navigating bridge to summon the crew to the fire station.
- .3 States the location and use of the fire

- alarms and the emergency controls.
- 13.2 Fire control plans, muster lists and duties of the individuals.
- .1 Describes fire control plans and where they are located.
 - .2 Describes a muster list.
 - .3 Gives examples of duties of individual crew members.
- 13.3 Communications
- .1 Describes methods of communications used during a fire emergency as:
 - messengers
 - telephones
 - walkie-talkies
 - ship to shore V.H.F.
 - use of the public address system.
- 13.4 Personnel safety procedures
- .1 Describes how a fire-fighting team is made up and states who is in charge.
 - .2 States that the fire zone may not be entered unless orders to do so have been given by the person in charge.
 - .3 States the need to be familiar with the area of fire zone and escape routes
 - .4 States the need to be properly equipped to enter the fire zone, especially if the lights have failed and space is full of smoke.
 - .5 States how everyone has to be dressed.
 - .6 States how important is to know the proper use of the fire-fighting equipment and to be away of any potential fire hazards.
 - .7 Lists what equipment is required including:
 - breathing apparatus
 - hand lantern

- axe
 - fire proof life-line with fittings.
 - .8 Explains how to use the life line for signaling.
 - .9 States the need to be flexible to allow for vacancies in the necessary fire parties.
- 13.5 Periodic shipboard drills
- .1 States the purpose of these drills.
 - .2 Describes typical exercises for use during fire drills such as:
 - Extinguishing a fire in a deep fryer.
 - Entering a closed room on fire.
 - Extinguishing a major deck fire.
 - Rescuing an unconscious person from a smoke filled space.
- 13.6 Patrol systems
- .1 States that on ships having more than 36 passengers an efficient patrol system must be maintained.
 - .2 Lists the duties of the patrol.
- 13.7 Handling the casualties.
- .1 Measures which had to be taken when entering a dangerous (under fire or smoke) space for saving an unconscious person.
 - .2 Gas-freeing state. Special notice for tanker.

14.- FIRE FIGHTING METHODS

- 14.1 Sounding the alarm and first actions.
- .1 To distinguish the fire alarm from other signals.
 - .2 States as actions on discovering a fire.
 - activate alarm
 - if possible remove cause of fire
 - if possible restrict ventillation

- 14.2 Locating and isolating.
Understands that these two must be his first actions.
- 14.3 Jettisoning.
States the necessity of jettisoning when it is easy and possible.
- 14.4 Inhibiting.
The most important action is not to permit a fire to spread.
- 14.5 Cooling.
Understands the importance of lowering the temperature of the burning "fuel".
- 14.6 Smothering.
States all the ways of smothering the fire by any means: steam, CO₂, funnel gas etc.
- 14.7 Extinguishing.
The main effort. Dangers.
- 14.8 Reflash watch.
The necessity of watching the area where a fire has been just extinguishing.

15.- FIRE-FIGHTING AGENTS

- 15.1 Water, solid jet, spray, fog, flooding.
Explains how, where and when the above agents can offer very satisfactory results.
- 15.2 High, medium and low expansion foam.
More details for the way foam is acting.
- 15.3 Carbon dioxide. CO₂
- .1 How to use and how it works on the fire. Dangers when using them. Evacuation.
 - .2 Portable extinguishers.
- 15.4 Halon
- .1 Describes halon 1211 and halon 1301 and their grades.

- .2 Advantages.
- .3 Mechanism of extinguishing the fire.
- .4 Applications.
- 15.5 Aqueous film forming foam.
States the way it is used.
- 15.6 Dry chemicals, powder.
In what condition they can be found on a ship
and how where they can be used.

I.5 Course E

Advanced

Fire Fighting Course

Course Outline

- 1. Introduction (01.00)**
 - 1.1 Fire control on board ships
 - 1.2 Structural fire protection on cargo ships
 - 1.3 Structural fire protection on passenger ships

- 2. The organisation of fire parties (01.00)**
 - 2.1 Formation of an emergency response team.
Bridge, engine, general and support teams
 - 2.2 Emergency alarms and musters
Initial actions as a response
 - 2.3 The role of team leaders
 - 2.4 Team effectiveness
 - 2.5 Emergency organisation relationships

- 3. Training of fire parties (01.00)**
 - 3.1 How the maximum state of readiness has to be achieved
 - 3.2 Drill planning
 - 3.3 "Know your ship"
 - 3.4 To anticipate situations
 - 3.5 Mental rehearsal of actions

- 3.6 Identification of probable areas and types of fires
 - 3.7 Awareness of alternative escape routes
 - 3.8 Awareness of the capability of equipment
-
- 4. Fire - fighting procedures at sea. (00.30)
 - 4.1 General
 - 4.1.1 Ventilation
 - 4.1.2 Control of electrical systems
 - 4.1.3 Control of fuel when the fire is in the engine room
 - 4.2 Specific
 - 4.2.1 Fire in the holds
 - 4.2.2 Fire in accommodation spaces
 - 4.2.3 Fire in engine-room and mashinery spaces
 - 4.2.4 Fire in refrigerated spaces
-
- 5. Fire - fighting procedures in port. (00.30)
 - 5.1 Combined action: crew and fire-brigade
 - 5.2 Cautions. Stability problems
 - 5.3 Tanker fires in ports
 - 5.3.1 Safety measures
 - 5.3.2 Fire-fighting
-
- 6. The hazards associated with the storage and handling of materials. (00.30)
-
- 7. Inspection and servicing (01.30)
 - 7.1 Various equipment
 - 7.2 Portable and mobile fire extinguishers
 - 7.3 Fire detection systems
 - 7.4 Fireman's outfit

- 7.5 Fixed fire-fighting systems.
8. Use of water for fire extinguishing, the effect on ship's stability, precautions and corrective procedures. (00.30)
- 8.1 General information.
Problems when using water as an agent.
- 8.2 Quick review of stability calculations
- 8.3 Corrective procedures
9. Fire - fighting involving dangerous goods. (02.30)
- 9.1 General introduction to the IMDG Code
- 9.2 Fire prevention as the main element of safety against fire
- 9.3 The emergency schedules
10. Ventilation control. (00.20)
- 10.1 The fire and the oxygen
- 10.2 The automated fan shut-off system
11. Hazards fire - fighting process. (00.30)
(Toxic hazards caused by fires.)
- 11.1 Hazards related to smoke and toxic gases
- 11.2 The burning of polymeric materials
- 11.3 How to reduce the hazards in fires
12. Fire investigation and reporting. (01.40)
Examples given for:
- 12.1 Training

- 12.2 Crew carelessness
- 12.3 Unsufficient maintenance
- 12.4 Collision, lack of communication

- 13. Gases. (01.10)**
 - 13.1 Safety on gas carriers
 - 13.2 Personnel protection
 - 13.3 Gas detectors and analysers
 - 13.4 Crude oil gases
 - 13.5 Gas freeing

- 14. Cargo fires (01.00)**
 - 14.1 Coal
 - 14.2 Cotton
 - 14.3 Jute
 - 14.4 Iron ore
 - 14.5 Fires in containers

- 15. Fire prevention and fire fighting on ships under construction or repairs. (00.30)**
 - 15.1 General safety rules and measures
 - 15.2 Fire-fighting devices on ships under construction or repairs
 - 15.3 Dangers when the ship is in the shipyard

- 16. Helicopter assistance. (00.30)**
 - 16.1 Ship operations and procedures
 - 16.2 Air - marine communications

- 17. Safety programme for chemical carriers. (01.30)
 - 17.1 Safety training
 - 17.2 Safety promotion
 - 17.3 Operational preparedness
 - 17.4 Emergency response
 - 17.5 Medical response.

- 18. Cardiopulsory resuscitation (00.20)
 - 18.1 Definition
 - 18.2 Signs of cardiac arrest
 - 18.3 Method
 - 18.4 Possible damage

- 19. Written examinations. (01.30)

**ADVANCED FIRE-FIGHTING COURSE
TIME - TABLE**

	1st DAY	2nd DAY	3rd DAY
1st period	1. Introduction 2. Organization of fire parties.	9. Fire-fighting involving Dangerous Goods.	13. Gas detection 14. Cargo fires.
2nd period	2. Continued. Training of parties.	9. Continued. 8. The use of water and the stability of the ship.	14. Continued. 15. Fire fighting on ships under construction. 18. Cardiopulsory
3rd period	4. Fire-fighting procedures at 5. Fire-fighting procedures in ports. 6. Hazards asso- ciated with storage.	10. Ventilation control.	17. Safety pro- gramme for the chemical tan- kers.
L U N C H			
4th period	7. Inspection and servicing.	12. Fire inve- stigation and reporting. 16. Helicopter assistance.	19. Examinations.

Advanced Fire Fighting Course

Course Syllabus

1.- INTRODUCTION

1.1 Describes all the equipment available on board, the need of good maintenance and the good use of them.

1.2 and 1.3 States that on November 20 1981 the first set of amendments to the 1974 SOLAS were ratified by IMO's Maritime Safety Committee. These amendments came into force on Sept. 1st 1984 and they formed a set of rules with which new cargo ships are required to comply, concerning one of the three methods of structural fire protection.

Method IC requires all bulkheads, ceilings and linings to be non-combustible.

Method IIC, imposes no restriction on materials used for the above parts and sprinklers while method IIIC permits combustible bulkheads, ceilings and linings within a network of "A" and "B" class divisions with the provision of a fire detection system.

2.- THE ORGANISATION OF FIRE PARTIES.

2.1 Formation of emergency response teams.

Bridge team, engine-room team, emergency teams and support team, their duties.

2.2 Emergency alarms and musters.

States that irrespective of whether the vessel is at sea, at anchor or in port, on hearing an emergency alarm, teams must muster at their designated stations.

Great emphasis must be placed on this initial muster of personnel at their stations.

- Understands what is the individual's initial response to an emergency situation.
 - .1 On discovery, raises the alarm.
 - .2 Provides quick and correct information to the control center.
 - .3 Attempts to control the emergency by whatever mean available.
 - .4 Immediate muster.
 - .5 Leaders to report to the bridge.
- 2.3 - The role of team leaders.
- 2.4 - Team effectiveness.

To be so organised in harvesting such skills through realistic simulation of all forms of emergency.

Skills: Fire - fighting, enclosed space entry, search and rescue techniques, communications, electrical, mechanical, seamanship and survival skills, as well as knowledge of the ship and its equipment, damage control, team spirit etc.

- 2.5 - Emergency organisation relationships
- .1 Alarm response.
 - .2 Emergency in the engine room: Using the Fixed fire-fighting equipment.
 - .3 Response in all other type of emergencies.
 - .4 Checklists for team members at muster stations
 - .5 Emergency equipment check lists.

3.- TRAINING OF FIRE PARTIES

3.1 Understands that a maximum state of readiness has to be promptly established and a relevant response to emergency situations must be achieved.

3.2 Planning drills

As regular practices have to be carried out, they have to be as realistic as possible.

3.3 "Know your ship"

On joining any vessel, all personnel have to know and determine their role in an emergency situation and be familiar with:

- Accommodation
- Machinery spaces, pumprooms and rudder-room.
- All store rooms and lockers.
- Position of all alarm buttons.
- Position of muster stations and emergency equipment lockers.
- Location of fire hoses, fire hydrants and portable fire fighting equipment.
- Location and operation of all fire pumps.
- The position and operation of all fire extinguishing systems.

3.4 To anticipate situations.

Such as fires, grounding, collision, man overboard spillage, oil pollution, loss of steering and rescue from enclosed spaces.

3.5 Mental rehearsal of actions.

States that it should be noted that in addition to format practical drills, opportunities should exist and must be taken for individuals to imagine or anticipate emergencies that could occur and then define alternative actions that could be taken in each of these circumstances.

- 3.6 States the need to practice all the crew members in identification of all types of fires and the probable areas where they can be found
- 3.7 Awareness of alternative escape routes for all the crew members. Emphasis must be given for seafarers serving on passenger ships where it is one of their duties to guide the passengers through the right route to safety.
- 3.8 The dense use of the fire-fighting equipment will give the opportunity to all seafarers not to over-estimate the capabilities of his equipment against the fire.

4.- FIRE FIGHTING AT SEA

- 4.1 To know where the ventilation system of every ship's compartment can be shutoff. The same must be known about the automated and manual fuel-stop.
- 4.2 Information about methods of fire-fighting in any of the ship's compartments must be given:

- .1 Fire in a hold:

- States that the main problem is of not having easy access for good and easy fighting.

- The use of a fixed extinguishing system.

- Cautions taken when opening the hatch cover. Never open if the fire-fighting equipment is not ready or the ship has not being set in the proper course yet, etc.

- Cautions for people entering the hold to fight.

- How to locate the fire in a smoke-full and loaded ship's hold.

- .2 Fire in accommodation spaces.

- Understands the point that in this place a fire is easy to be located but difficult to fight.

Ventilation and fixed fire-fighting systems.
Electricity and the use of water. Black-outs and the need of familiarisation of the fire party with all the fire station places.

.3 Fires in enginerooms and machinery places.

States the need of immediate action as so many combustible materials are stowed around.

First actions.

Controlling the oil feed lines. The importance of good maintenance of the extended spindles. The use of the fixed fire-fighting systems. How to enter the engine room when it is under fire.

Checking the personnel. The risk of explosion.

.4 Fire in refrigerated places.

The main characteristics and difficulties of such operations. The many compartments with heavy doors the methyl chloride all around together with ammonia in some cases, cause the main difficulties.

The possibility of using freon as an extinguishing agent.

5.- FIRE - FIGHTING PROCEDURES IN PORT

5.1 To achieve a successful combined operation with the local fire brigade. What procedures have to be followed. How to co-operate, what equipment can be used. Communications.

5.2 Stability problems which may arise because of the possible non-familiarisation of the firemen with ships.

5.3 Tanker fires in port.

How to fight the oil fire both on water and land. The familiarisation with the berth's fire-fighting system as well.

Foam fighting from land equipment.

The evacuation system.

Inert gas and its limitation when external fire has occurred.

Moorings for tankers in loading/discharging operations. Tug-boats' assistance.

6.- THE HAZARDS ASSOCIATED WITH THE STORAGE AND HANDLING OF MATERIALS.

States in which spaces and under what conditions some materials are stored.

Special care for boatswain's paint lockers, thinners, epoxy coatings, diesel oil and generally all materials which may produce flammable or combustible gases.

Chief Stewart's and Chief Engineer's lockers organisation and inspection.

7.- INSPECTION AND SERVICING

Understands the importance of the periodical inspections to ensure that all the fire-fighting equipment required is ready for immediate use.

Occasional tests for the purpose of making a general inspection of the fire prevention, detection, and extinguishing equipment, should be made by the safety officers and masters.

7.1 Fixed fire fighting installations

.1 Carbon dioxide systems.

States the need of periodically repeated inspections of the system. Renewed, refilled or new deliveries of pressure bottles have to be stamped to show its tare weight and the liquid capacity.

States the basic rules of keeping bottles under pressure.

The pressure cylinders should be secured dry, well lighted and well ventilated in such a place where the risk from any possible leakage is estimated as zero.

Check list: distribution arrangement, pipe connections, operating instruction labels.

.2 Inert gas systems.

Tests for rate of gas production and its generator from the mechanical and safety point of view.

To check the mechanism of non-return valve and the isolating stop valve.

.3 Steam smothering installations.

States the need of the periodical check of the system and when is the right time for doing so.

Also states the rules of good maintenance.

.4 Foam installation.

States ways for checking:

- piping free of the system
- sufficient foam compound being carried to cover all remaining hazardous areas to a depth of 15 centimeters
- the charge in the mixture tank being such that one recharge only is necessary to cover all remaining areas required to be protected (15 cm)
- sufficient spare cylinders being carried in the right place for easy access, so that this second item may be discharged within 5 minutes.

.5 Automatic sprinkler.

Check list:

- pressure tank: how to check the relief valve as well as the stop valves or cocks
- air supply

- pipes
- external connections as the ship's fire main and its non-return valve (screw-down-stop-valve)
- shut-off valves for the shore supply
- pump
- sprinkler heads
- its automatic alarm and the central test valve.

7.2 Manual fire alarms.

States the need of checking the manual fire alarm push buttons or similar devices which are positioned at strategic positions.

7.3 Portable and mobile fire extinguishing equipment.

General rules for checking these equipment.

- clean cocks,
 - good accommodation of the hoses attached etc.
- Charges have to be checked for condition annually.

7.4 Other fire-fighting equipment.

.1 Pumps.

States that these have to be checked periodically supplying sea water to the fire's main but also to deck foam systems and to the cargo pump room spray systems in tankers. Special care to the self contained compression ignition system.

.2 Hydrants

States the need of keeping these parts in good condition.

.4 Fire hoses.

The need of good condition, dry, salt free, with greased couplings and that they should be efficiently connected to their end-coupling.

.5 Nozzles and spray-nozzles.

To be checked when on drill (about 12 meters under 7 bars.) The spray setting should produce a

reasonable fire-spray which can be arranged to form a curtain behind which it could be possible to approach a fire. (Diameter 5 meters of a distance of 2 meters.

- .6 **Hose couplings and International shore connection.**
States the need of good maintenance and knock-free of the bronze-made couplings.

The international shore connection must be placed in the right place and suitable provision must also be made to enable it to be used at any hydrant ashore and from any side of the ship.

- .7 **Fireman's outfits.**

- **Breathing apparatus.** States the periodical check of the following parts: air-hose, helmet or mask, automatic air supply valve, (both: pressure reducing valve and demand valve.) safety belt harness, life line etc.

- **Air-compressors.** (for refilling the s.c.b.a.)

To ensure the proper working of the machine and that the air intakes are clear from any water or fumes. Checking the filters, dryers, etc.

- **Safety lamps.** To ensure that the battery operated lamps can work for at least 3 hours.

8.- THE USE OF WATER FOR FIRE EXTINGUISHING.

The effect on ship's stability, precautions and corrective procedures.

- 8.1 Although stability theory has not changed, the present generation of seafarers tend to rely more on stability indicators or computers to solve problems. For this reason a special turnback on the theory is necessary.

What problems can be encountered when using water as a fighting agent. The effect of free surface and the loss of stability.

- 8.2 To calculate the changed GM value till the real capsizing danger will start.

Measures of stability

Metacentric height

Curve of statical stability (GZ curve)

Free surface effect

Limitations on the usual method of assessment of free surface effect. (The worst condition calculation.)

- B.3 Corrective procedures.

The ejector pumps. Description of the most well-known types.

Other floating portable pumps.

9.- FIRE FIGHTING INVOLVING DANGEROUS GOODS

- 9.1 General introduction about the IMDG Code and the principles which it lays down.

- Stowage requirements and definitions.

- 9.2 Fire prevention as the main element of safety.

States the special care which has to be given to the basic rules of fire prevention on board ships carrying dangerous goods:

- Keep combustible materials away from any ignition source.

- Protect any inflammable substance by perfect packaging. Reject damaged or leaking packages.

- Stow in places where packages are protected from accidental damage or heating and segregate them from substances liable to start or spread fire.

To be stowed below any sprinkler when possible.

- Ensure accessibility.
- "No smoking" labels to be displayed around.
- Preparation has to be made against the possible fire on the dangerous goods carried as everyone may have a different way of attacking the fire.
- The risk of poisoning.
- Check of the hold's ventilation, inert gas system, dry chemical extinguishers or CO2 smothering system.

9.3 The Emergency Schedules.

.1 Group title - Ems No. -

Ships masters are responsible for carrying every detailed fire-fighting equipment suitable for the group of the dangerous goods carried.

.2 Equipment to be carried.

Special care and useful instructions about the protective clothing and the self contained breathing apparatus.

Water spray nozzles to be ready on place when water is not reacting with the dangerous goods carried.

.3 Emergency procedures.

The preparation of the emergency team prior to dealing with the incident. The need of good preparation.

- Full protective clothing preparation.

.4 Emergency actions.

In general: Spillages, fire and jettisoning.

.5 First aid treatment.

The use of MFAG. The use of IMO's MFAG for use in accidents involving Dangerous Goods.

10.- VENTILATION CONTROL.

- ### 10.1 The fire and its need of oxygen. Quick review.

- 10.2 Introduction in automated fan control. Practical rules for shut-off ventilation systems on ships.

11.- FIRE FIGHTING PROCESS HAZARDS

(Toxic hazards caused by fires)

- 11.1 An outline must be given of the hazards which can rise in fires, particularly those related to smoke and toxic gases.
- 11.2 To describe and identify decomposition products and fire gases from the burning of polymeric materials.
- 11.3 To demonstrate how the reduction in the ignitability and rate of fire growth can help to reduce the overall hazard in fires.

12.- FIRE INVESTIGATION AND REPORTING

As maritime history includes so many cases of fire on board ships it has been considered that lessons can be received from any disaster.

The following cases have been selected to be discussed in the class.

- "Morro Castle." Insufficient training.
- "Normandie" Carelessness in handling hot works during repairs
- "Laconia" Panic, insufficient leadership, lack of maintenance of the abandoning equipment, the drill's need.
- "Alva cape" - "Texaco Massachusetts" Collision, lack of communication and taking care the fire-fighting crew members.

13.- GAS - DETECTION AND FIRE FIGHTING

13.1 Gas detectors and analysers.

**.1 Catalytic combustion. Lower exposure limit. (LEL)
Advantages of the oldest method.**

Disadvantages. Zero point drift and sensor life.

.2 Gas sensitive semi conductors.

Description.

Advantages. Stable zero and very long operational life.

Disadvantages. Very widespread measuring spectrum of most common hydrocarbons.

- The infra-red absorption method, description of this precise and advanced gas detection.

- Gas interference effects.

.3 Gas analysers.

Testing before and during the measurement.

The requirements for instruments (portable) and fixed gas alarm systems on all types of ships.

Explosive limits.

13.2 Crude oil gases.

.1 Health hazardous gases from crude oil and inert gas system.

.2 Portable gas measuring instruments.

- Catalytic combustion measuring principle.

- Calibration gases. Butane and methane. Where and how they are used.

- How all explosive-meters must therefore from time to time be checked with a calibration gas-meter.

.3 Gas freeing and measurements.

Gas freeing by ventilation. Two ways.

Gas freeing for entry.

Gas freeing for cold work permission.

Gas freeing for hot work permission.

14.- CARGO FIRES.

Certain knowledge has to be gained for some kind of cargoes still carried in bulk.

14.1 Coal.

The risk of spontaneous combustion.

The IMO's recommendations.

The chemical process with oxygen and the physical process of disintegration.

The speed of the oxidation and the role of ventilation. The "rate of rise".

Gases, hot air and other products from the oxidation.

Successful methods of preventing heating in coal.

Recommendations requested from the shippers.

14.2 Cotton.

Cotton, cotton waste and rags as danger goods in the IMDG Code.

Cotton fibre composition. Ignition temperature in accordance with the area.

Wet or dry bales?

Detection. Search for some ignited bales before loading.

Re-flashing.

14.3 Jute

Description. Origin and condition when loading.

The water as an extinguishing agent and the possibilities of creating further problems after using it. Other cautions.

14.4 Iron ore.

The "reduced" iron and the dangers to the ship.

The water reactivation dangers.

The F.I.O.R. briquettes and dangers from the explosive levels of hydrogen which can be recorded when they are wetted.

14.5 Fires in containers.

States the infrequent occurrence of a fire in a closed container but that the difficulty of not having an easy access to the place of fire, puts this kind of danger in a high position.

The need of good segregation, prevention and preparation. The use of the fixed fire fighting line. The self oxygen generating materials.

15.- FIRE PREVENTION AND FIRE FIGHTING ON SHIPS UNDER CONSTRUCTION OR REPAIRS.

15.1 In general:

- .1 Precautions when carrying out fire hazardous works on ships.
- .2 Fire safety measures for hot work.
- .3 Fire prevention while painting and fitting insulation.
- .4 Fire prevention while washing and decreasing ship's equipment.
- .5 Fire safety measures when using temporary electrical lighting and electrical equipment.
- .6 Fire safety measures for ships in docks and ship-yard water areas.

15.2 Fire-fighting devices on ships under construction or repairs.

- .1 Water-based fire extinguishing systems.
- .2 The use of foam appliances.
- .3 Portable fire-fighting appliances.

15.3 States the dangers when the ship is in the yard. because of:

- .1 Decreased number of crew member and partly new members.
- .2 Works with a high fire risk.
- .3 Materials with a high fire risk being stored in inappropriate places.
- .4 People mostly not familiar with ships on board.
- .5 Lower standard of watchkeeping.
- .6 Alarms usually out of order.
- .7 Fixed fire extinguishing systems out of order and fire extinguishers and other fire fighting materials taken ashore for overhandling.
- .8 Fire pumps and fire main line without water.
- .9 Emergency and normal exits blocked by shipyard materials.

16.- HELICOPTER ASSISTANCE

16.1 Ship operations and procedures.

- .1 Guidance for management.
- .2 Flight safety
- .3 Operating guidance.
- .4 General ship requirements.
- .5 Ship operating procedures.
- .6 Navigation and signaling.

16.2 Air - marine communications.

The problems of compatability.

- .1 The amplitude modulation in the VHF radiotelephone system.
- .2 The characteristics of VHF transmissions.
- .3 ITU and SOLAS regulations.
- .4 Agreements from the International Convention on Maritime S.A.R. 1979
- .5 Reporting systems.

**17.- SAFETY PROGRAMME FOR CHEMICAL TANKERS.
AND ON LPG/LNG CARRIERS.**

In general:

States the special emphasis which has to be given on this subject as it has to be well understood that chemical tanker's operators face unusual considerations regarding safety as cargoes carried by these ships frequently are hazardous in nature. IMO's Bulk Chemical Code and what it covers. Acute toxicity, flammability, water reactivity, corrosiveness, volatility, polymerization and oxygen depletion.

17.1 Safety training.

- .1 Cargo handling, cargo related emergencies and medical treatment of personnel exposed to hazardous cargoes.

The special ways of working the cargoes on a chemical tanker. How the loading system operates.

Tank cleaning and preparing.

Information about the fire fighting procedures when any chemical is involved. General fire fighting techniques can be introduced to the trainees, but they have to understand that the fighting medium varies with the cargo.

For this: two books have to become their knowledge (i) "Fire Protection Guide on Hazardous Materials" published by the National Fire Protection Association, Boston, and (ii) Emergency Procedures for Ships Carrying Dangerous Goods, published by IMO.

.2 Safety promotion

Understands the importance of development and improvement of safety consciousness.

Understands the need of maintaining a safety attitude and strong safety posture among sea personnel

.3 Operational preparedness.

States the importance of pre-planning the cargo handling operations and the good communications needed as this work is very detailed and must be closely scrutinized by all parties involved.

The need of keeping the emergency equipment in very good order as the SCBA, the vapour detectors or the hand operated aspirator.

.4 Emergency response.

As this is a critical area, the trainee have to know the initial actions when such a tanker gets in a distress situation from grounding, collision, or engine breakdown.

.5 Medical response.

The subject is focused on chemical burns, inhalation and ingestion.

The IMO's MFAG for use in accidents involving Dangerous Goods and the antidotes. How to use them in case of chemical poisoning.

17.2 Safety on LPG/LNG carriers.

CO2 system. Remote shut-off fan and machinery systems. Pressure and low/high temperature alarms. Safety relief of cargo tanks. Water showers. Analysers.

18.- CARDIOPULMONARY RESUSCITATION.

Understands this type of heart-lung resuscitation.

- Signs of cardiac arrest. As both the physical exertion required of sailors fighting the fire and lack of oxygen due to the smoke, add to the probability of cardiac arrest.

- When there is no respiration, checks and actions.
- When there is no pulse, checks and actions.
- The right way of offering this kind of help.
- Various possible damages which can occur after the use of the cardiopulmonary resuscitation.

I.6 Course F

First Aid Course

Course Outline

- 1. Introduction (01.30)**
 - 1.1 First Aid. What it includes
 - 1.2 Diagnosis and its importance
 - 1.3 Priorities on finding a casualty
 - 1.4 General principles of first aid aboard a ship
 - 1.5 General assessment of the situation
 - 1.6 Anatomy and physiology
 - .1 Bone structure
 - .2 Muscles
 - .3 Skin and
 - .4 various systems of the human body

- 2. Shock (00.30)**
 - 2.1 Definition
 - 2.2 Signs and symptoms
 - 2.3 Common causes for aggravation

- 3. Suffocation (00.30)**
 - 3.1 Definition
 - 3.2 Causes
 - 3.3 Diagnosis
 - 3.4 Treatment

- 3.5 Artificial respiration
Sylvester method, mouth to mouth

- 4. Wounds and bleeding (02.00)
 - 4.1 Types/categories according to the problem caused
 - 4.2 How to define the type
 - 4.3 How to control bleeding. Bandages
 - 4.4 Internal bleeding. Signs and diagnosis
 - 4.5 Treatment

- 5. Fractures (01.30)
 - 5.1 Types and definitions
 - 5.2 Principles of treatment
 - 5.3 General treatment
 - 5.4 Taking care of the patient
 - 5.5 Head injuries and fractures
 - 5.6 Dislocations, diagnosis and treatment

- 6. Burns (00.45)
 - 6.1 Types of burns and definitions
 - 6.2 Treatment
 - 6.3 Special burn gauze dressing

- 7. Poisoning (00.45)
 - 7.1 Types and definitions
 - 7.2 Signs and diagnosis
 - 7.3 Treatment

- B. Unconscious casualty** (01.30)
 - B.1 Causes
 - B.2 Treatment
 - B.3 Practice and treatment
 - B.4 Transportation of an unconscious person

- 9. Survivors** (02.00)
 - 9.1 Definitions of hypothermia and of other damage from the cold
 - 9.2 Diagnosis and treatment
 - 9.3 Hot shock
 - 9.4 Diagnosis and treatment
 - 9.5 Treatment of an exhausted man after having being to a great heat

- 10. The use of Medical. First. Aid. Guide.** (01.00)
 - 10.1 How to use
 - 10.2 Medical advice for dangerous goods
 - 10.3 First aid in poisoning by chemicals

**FIRST AID AT SEA
COURSE TIMETABLE**

Period	1st DAY	2nd DAY
1st period	1. Introduction Demonstration Cassette ML15/1 "Emergency" 16min.	5. Fractures Demonstration Cassette ML15/4 "Bones can break" 15 min.
2nd period	2. Shock 4. Wounds and bleeding. Cassette ML15/3 "Blood loss and shock." 16 min.	8. Unconscious casualty. Demonstrate resuscitation unit.
3rd period	4. Continued. 3. Suffocation. Cassette ML15/2 "As I live, I breathe." 17 min.	9. Problems caused by heat and cold. -Hypothermia.- Cassette DS7 "Cold shock." 22 min.
L U N C H		
4th period	6. Burns. and 7. Poisoning.	9. Continued about cold and hypother- mia. Cassette (if time permits) DS15/4 "Techniques of survival." 21 min.

First Aid At Sea

Course Syllabus

1. INTRODUCTION

- 1.1 First Aid. What it contains. Information about the RADIO MEDICAL ADVICE.
- 1.2 The diagnosis and its importance.
- 1.3 Priorities on finding a casualty.
 - .1 Own safety
 - .2 Remove the victim from the danger.
 - .3 Immediate treatment.
 - .4 Send for help.
- 1.4 General Principles of First Aid aboard a ship.
 - .1 Rapid examination.
 - .2 Various checks.
 - .3 How to handle with care.
- 1.5 General assessment of the situation.
 - .1 Calm and systematic approach.
 - .2 Underestimation problems.
 - .3 Rules to remember.
- 1.6 Anatomy and physiology.
 - .1 Bone structure.
 - .2 Voluntary muscles.
 - .3 Involuntary muscles.
 - .4 Circulatory system.
 - .5 Breathing system.
 - .6 Digestive system.
 - .7 Urinary system.
 - .8 Nervous system and
 - .9 Skin.

2. SHOCK

- 2.1 Definitions.
- 2.2 Causes of shock.
- 2.3 Signs and symptoms,
 - speech, breathing, colour change etc.
 - .1 If the victim is conscious.
 - .2 If the victim is unconscious
 - .3 Treating yourself.
- 2.4 Treatment. Necessary steps.

3. SUFFOCATION (asphyxia)

- 3.1 Definition- lack of oxygen in the blood.
- 3.2 Causes.
 - .1 Blocked air passage or
 - .2 Caused by gases or smoke.-
- 3.3 Signs and symptoms. Diagnosis.
Breathing, heart pulses, skin blueness, e.t.c.
- 3.4 Common causes for aggravation
 - .1 Main rules
 - .2 Artificial respiration: mouth to mouth and Sylvester's method.
 - .3 The use of compressed oxygen.
 - .4 The use of the relevant apparatus: resuscitation unit with oxygen and suction.

4. WOUNDS AND BLEEDING

- 4.1 Wounds, types and simple rules
- 4.2 Categories and definitions:
 - .1 Metal fragment wounds.
 - .2 chest.
 - .3 abdomen.
 - .4 head, face and jaw wounds.
 - .5 leg/hand or palm wounds.

4.3 Crush injuries.

- .1 Limbs.
- .2 Chest.
- .3 Abdomen.

4.4 Stab wounds.

- .1 Limbs.
- .2 Chest.
- .3 Abdomen.

5. FRACTURES

5.1 Types and definitions.

- .1 Closed fractures.
- .2 Open fractures.

5.2 Principles of treatment. Examination.

5.3 General treatment.

5.4 Taking care of the patient.

- .1 Collar bone, shoulder and shoulder blade.
- .2 Upper arm, fore arm and wrist.
- .3 Elbow.
- .4 Hand and fingers.
- .5 Kneecap, foot, heel.
- .6 Jaw.
- .7 Spine, neck.

5.5 Dislocations.

- .1 Definitions, diagnosis and treatment.

6. BURNS

6.1 Definitions and types of burns.

- .1 First degree burns.
- .2 Second degree burns.
 - Superficial second degree burns.
 - Deep second degree burns.

- .3 Third degree burns.
- 6.2 Treatment - general rules. Fluid loss.
- 6.3 Special burns. Chemicals.

7. POISONING

- 7.1 Definition and types of poisoning.
- 7.2 Inhaled poisons.
 - .1 Symptoms and treatment.
- 7.3 Swallowed poisons.
 - .1 Symptoms and treatment.
- 7.4 Skin and eye contact.
- 7.5 Basic rules for avoiding poisoning.

8. UNCONSCIOUS CASUALTIES

- 8.1 Causes.
- 8.2 Treatment
 - .1 Treatment when throat problems occur.
 - .2 Treatment when the heart stops.
- 8.3 Various checks and how they have to be done.
- 8.4 Urgent actions. The real meaning of time. How important it is to know the cause of the casualty in deciding to move the injured person or not.
- 8.5 Urgent actions:
 - .1 When breathing.
 - .2 When not breathing.

9. PROBLEMS CAUSED BY HEAT AND COLD

- 9.1 The body's thermal balance.
 - .1 Hypothermia and other effects of extreme cold, or by the prolonged exposure of the human body to the cold.

- .2 Muscular activity. What to do.
- .3 Frostbite.
- .4 Frostnip.
- .5 Cold-burn.
- 9.2 Effects of heat.
 - .1 The ability of the body to preserve its normal temperature. Losing heat from the body.
 - .2 Insulation.
 - .3 Acclimatization to heat.
 - .4 Humidity.
- 9.3 Heat exhaustion
 - .1 Symptoms and treatment.
 - .2 What has to be avoided. General rules.
- 9.4 Heat stroke and its treatment.
- 9.5 Sunburn and its care.

10. THE USE OF M.F.A.G.

- 10.1 How to use this guide.
 - The general index.
 - The U. N. number.
 - The "proper shipping name".
- 10.2 Medical advice relating to the dangers of the carriage of chemicals by ships.
 - The general hazards.
 - Main actions after poisoning.
- 10.3 First aid in poisoning by chemicals. How to get the right information from the M.F.A.G.

CHAPTER

II

Safety Courses in Greece

by

Christoforos Papatheofilou

II.1.- PROMOTION REQUIREMENTS OF SEAFARERS

For matters of simplicity five flow charts have been put in Appendix, to illustrate the paths of promotion in the respective careers of Greek seafarers.

With the aid of these flow charts, one may see at what stage the respective seafarer need take the safety courses proposed.

II.2.- THE SEAFARER AND WHAT COURSES THEY HAVE TO ATTEND

Taking into consideration the present level of the seafarers on Greek flag ships, a proposed upgrading scheme has been devised.

The level of education of ratings and officers has been taken into account permitting them to have credits according to the level attained in any safety courses.

The minimum requirements to be attained by officers and ratings are indicated in Table 1.

For all the Greek seafarers who have taken the existing safety courses, they will be credited as follows:

TABLE No.1.

	Credits granted with respect to the existing system	Upgrading courses needed
Officers		
deck/engine	A, D, F.	B, E.
Rad./oper.	A, D, F.	B, C.
Skippers	A, C, F.	B, D.
Ratings		
A.B.s	A, C, F.	B, D.
Ass. Eng.	A, C, F.	D.
Catering	A, C, F.	-----

Those who have not attended any safety course must

reach the respective level of their rank.

It may be noted that the prospective seafarers graduating from the three year course of higher education in a maritime field, may have covered in their syllabus, part or all of the requirements necessary as regards safety matters for prospective seafarers.

It is obvious that they will be credited for what they have passed but will have to meet the minimum requirements before being employed in their respective specialisation.

TABLE No.2.

COURSES	deck/	R/op.	A.B.s	Ass.	Skip-	rest of
	/eng. off.					
(A)	X	X	X	X	X	X
(B)	X	X	X		X	
(C)		X				X
(D)	X		X	X	X	
(E)	X					
(F)	X	X	X	X	X	X

The categorisation of the courses has been done with respect to the technical knowledge acquired with the present educational system.

CHAPTER

III

Safety Courses in Greece

by

Christoforos Papatheofilou

III.1 PROGRAMME ANALYSIS

Shown in table 3, is the proposed upgrading of the existing system and in table 4 the proposed system to be implemented for the future seafarers.

The two systems are shown to work in parallel in Table 5 as this will be necessary until all the present seafarers have been upgraded thus the Training Center will only have to deal with prospective seafarers and those who require upgrading due to their advancement in their career.

In these tables one may see the courses which may be offered over a four-week period, being the total of one module.

From these five(5) tables it is easy for each individual seafarer to pinpoint his requirements giving him the possibility to attain them.

As seen from Tables 4 and 5, there is a possibility of offering two (2) "complete courses" consisting of A, C, F for prospective seafarers. Table 4a illustrates another possibility of scheduling.

This will allow courses B and D to be spread at the far ends of the module in cases where the demand will be higher than the expected.

Note: It may be noted that table 5, indicates a maximum possibility of courses. If the demand is less, where practicable, one course will be held for both categories.

Due to the fact that there is ample lighting in the ground and buildings of the Training Center, if needed, night classes may be held to cover any peak in demand that may arise. Due to the ceiling of 64 trainees (as indicated in paragraph III.2.2 of this chapter), a maximum of four (4) courses may be held simultaneously notwithstanding that the same course may be held in parallel as in the case of radio operators of both systems between the 9th and the 16th days.

...

For a seafarer to be eligible to do course B he must have completed 12 months at sea and be at least 18 years of age.

Medical examinations have to be completed before entering the training center.

As required by the Greek national regulations the following persons may also attend the courses but will not receive any certificate of proficiency unless they have completed 12 months in sea:

- petty officers and officers of the Greek armed forces, coast guard, firemen, policemen and any other government employee who will benefit from the courses.

TABLE 3

(refresher courses for existing seafarers)
UPGRADING THE EXISTING SYSTEM

week/day		Main offered courses	deck/ engine officers	Radio oper.	A.B.s	Ass. eng.	Skipper
	M 1	F					
1st week	T 2	F					
	W 3	A					
	T 4	A					
	F 5	A					
	M 6	D C			D	D	D
2nd week	T 7	D C			D	D	D
	W 8	D C			D	D	D
	T 9	D			D	D	D
	F 10	B	B	B	B		B
	M 11	B A	B	B	B		B
3rd week	T 12	B A	B	B	B		B
	W 13	B A	B	B	B		B
	T 14	E C	E	C			
	F 15	E C	E	C			
	M 16	E C	E	C			
4th week	T 17	F					
	W 18	F					
	T 19						
	F 20						

TABLE 4

(for prospective seafarers of all ranks)

SYSTEM TO BE IMPLEMENTED

week/day		Main offered courses	deck /eng off.	R/o	Pros. sea- far.	Stud. in mar. Acad.	Grad. from mar. Acad.	A.B and Skip-	Ass. eng.
	M 1	F			F				
1st week	T 2	F			F				
	W 3	A			A	A			
	T 4	A			A	A			
	F 5	A			A	A			
	M 6	D	C		C	C	D	D	D
2nd week	T 7	D	C		C	C	D	D	D
	W 8	D	C		C	C	D	D	D
	T 9	D					D	D	D
	F 10	B		B	B		B	B	
	M 11	B	A	B	B	A	A	B	B
3rd week	T 12	B	A	B	B	A	A	B	B
	W 13	B	A	B	B	A	A	B	B
	T 14	E	C	E	C	C	C	E	
	F 15	E	C	E	C	C	C	E	
	M 16	E	C	E	C	C	C	E	
4th week	T 17		F		F				
	W 18		F		F				
	T 19								
	F 20								

TABLE 4a

ALTERNATIVE APPROACH (of table 4 for higher output)

				deck Main offered courses	R/o and eng. off.	Pros. sea- fa- rer	Stud. in mar. Acad.	Grad. from mar. Acad.	A.B. and skip-	Ass. eng. pers
1st week	M	1	F	D		F				D
	T	2	F	D		F				D
	W	3	A	D		A	A			D
	T	4	A	D		A	A			D
	F	5	A			A	A			
2nd week	M	6	D	C		C	C	D		D
	T	7	D	C		C	C	D		D
	W	8	D	C		C	C	D		D
	T	9	D					D		D
	F	10	B		B			B		
3rd week	M	11	B	A	B	A	A	B		
	T	12	B	A	B	A	A	B		
	W	13	B	A	B	A	A	B		
	T	14	E	C	E	C	C	E		
	F	15	E	C	E	C	C	E		
4th week	M	16	E	C	E	C	C	E		
	T	17	B	F		B	F			B
	W	18	B	F		B	F			B
	T	19	B			B				B
	F	20	B			B				B

TABLE 5
WORKING THE TWO SYSTEMS TOGETHER

Day of the week	UPGRADING THE EXISTING SYSTEM				SYSTEM TO BE IMPLEMENTED			
	U R S E	deck and eng. off.	R/o A.B.	Ass. eng.	Deck and eng. off.	R/o pros sea -fa- rer	stud in Mar. Ac.	gra frm Mar. Ac.
M 1	F	D		D		F		D
T 2	F	D		D		F		D
W 3	A	D		D		A	A	D
T 4	A	D		D		A	A	D
F 5	A					A	A	
M 6	D	C		D		C	C	D
T 7	D	C		D		C	C	D
W 8	D	C		D		C	C	D
T 9	D			D				D
F 10	B		B		B	B		B
M 11	B	A	B		B	B	A	A
T 12	B	A	B		B	B	A	A
W 13	B	A	B		B	B	A	A
T 14	E	C	E	C	E		C	C
F 15	E	C	E	C	E		C	C
M 16	E	C	E	C	E		C	C
T 17	B	F	B	B		F		B
W 18	B	F	B	B		F		B
T 19	B		B	B				B
F 20	B		B	B				B

III.2 PROGRAMME OF THE WHOLE ACADEMIC YEAR

The maximum use of the training center.

a. In general:

As shown in Table 6 the modules offered will be nine (9) per year, subject to normal operation of the training center.

Due to Greek national legislation the training center shall be closed for a fortnight at Christmas, as well as at Easter and for two months during the summer. If need be, the two months of the summer may be used for an additional two modules.

b. Analysis:

prospective seafarers :	16 students
	x 2 courses per module
	= 32 students
from upgrading the existing system	= 16 students
and +	
from following the new	= 16 students
total	= 64 students per module
	x 9 modules per year
	= 576 students per year (1)

This number represents the normal running of the center. One more group of prospective seafarers can be worked during afternoons and nights (i) as well as another group of professional seafarers can be worked on the far ends of every module for courses B and D. (ii) as indicated in table 4a.

This gives more:

from (i) 32 students
 x 9 modules
 = 288 students
from (ii) 16 students
 x 9 modules
 = 144 students

total of : 432 students (2)

From (1) and (2) total of :1008 students per year (3)

As the center's policy is never to keep any seafarer waiting for the next course to start, the possibility of working the training center during the two summer months has to be taken into account as the total students' number per year rises to:

$1008+(2 \times 64)+(2 \times 16)$ meaning :

normal working : 64 students
 x 2 modules
 = 128 students plus

more from afternoons: 16 students
 x 2 modules
 = 32 students plus

more from far ends : 16 students
 x 2 modules
 = 32 students meaning:
total : = 192 students (4)

from (3) and (4)

maximum capacity = 1200 students per year.

TABLE No.6

PROGRAMME OF THE YEAR 1989

Day	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	S	W	W	S	5 ^o M	T	S	T	F	S	W	F
2	M	T	T	S	T	F	S	W	S	M	T	S
3	T	*F	*F	4 ^o M	W	S	M	T	S	T	F	S
4	W	S	S	T	T	S	T	F	M	W	S	M
5	T	S	S	W	F	M	W	S	T	T	S	T
6	F	2 ^o M	3 ^o M	T	S	T	T	S	W	F	M	W
7	S	T	T	F	S	W	F	M	T	S	T	T
8	S	W	W	S	M	T	S	T	F	S	W	*F
9	1 ^o M	T	T	S	T	F	S	W	S	M	T	S
10	T	F	F	M	W	S	M	T	S	T	*F	S
11	W	S	S	T	T	S	T	F	M	W	S	M
12	T	S	S	W	F	M	W	S	T	T	S	T
13	F	M	M	T	S	T	T	S	W	*F	10 ^o M	W
14	S	T	T	F	S	W	F	M	T	S	T	T
15	S	W	W	S	M	T	S	T	*F	S	W	F
16	M	T	T	S	T	F	S	W	S	9 ^o M	T	S
17	T	F	F	M	W	S	M	T	S	T	F	S
18	W	S	S	T	T	S	T	F	8 ^o M	W	S	M
19	T	S	S	W	F	M	W	S	T	T	S	T
20	F	M	M	T	S	T	T	S	W	F	M	W
21	S	T	T	F	S	W	F	7 ^o M	T	S	T	T
22	S	W	W	S	M	T	S	T	F	S	W	F
23	M	T	T	S	T	F	S	W	S	M	T	S
24	T	F	F	M	W	S	M	T	S	T	F	S
25	W	S	S	T	T	S	T	F	M	W	S	M
26	T	S	S	W	F	M	W	S	T	T	S	T
27	F	M	M	T	S	T	T	S	W	F	M	W
28	S	T	T	*F	S	W	F	M	T	S	T	T
29	S		W	S	6 ^o M	T	S	T	F	S	W	F
30	M		T	S	T	F	S	W	S	M	T	S
31	T		F		W		M	T		T		S

CHAPTER

IV

Safety Courses in Greece

by
Christoforos Kapatheofilou

THE ESTABLISHMENT OF THE TRAINING CENTER

IV.1. Academic and administrative infrastructure.

It is proposed that the training center should be founded, as in the case of all maritime instructive centers in Greece, on a basis of 70% by the Greek Shipowners Association and the remaining 30% by the Greek Government.

Regarding the administrative load, it should be taken up by the Greek Coast Guard as in the cases of all the other maritime educational and training centers.

Under the Greek national legislation, the instructors are obliged to dedicate 16 hours in teaching and the balance of hours making up the total of one week, in matters related to the form (class) they have been specialized. These matters are of the following nature: preparing teaching material and correcting relevant assignments, preparing and correcting examinations and setting the suitable mark for each student in the register of which he is in charge.

The same applies for the chief instructor of the training center, with the only difference that the time spent instructing is 12 hours with the balance to make up one week spent on administrative co-ordination.

So as to enable a comprehensive study of the efficiency of the training center, two tables have been made. The former depicts the ratio of trainees to instructors and also indicates the instruction being carried out, and the latter indicates the total working hours on a weekly basis with respect to each instructor's specialisation.

In particular in table I, on the left part of

the page, are the twenty days of a complete programme followed by the respective courses. On the horizontal rows, the maximum number of students follows together with the instructor(s) indicative letter(s).

From Table II it becomes evident that the only specialisation who can be employed full-time would be that of the master mariner and forceably the other specialisations would have to be employed on a part-time basis.

When the center is going to be used for its maximum output, it has been considered that three master mariners and one more as chief instructor will be necessary for running the center. In case of working with one only "D and B" course, it has been considered that two master mariners plus the chief instructor would be enough.

The minimum qualifications of the master mariners to be employed should be the possessor of the master's mariner certificate of competency and should have five years in the most senior post of an international trading ship.

For the rest of the staff the same criteria as those of the maritime academies should be required.

The fire-fighting instructor to be employed should be an instructor of the fire brigade or to be a master mariner who has graduated from one of the training centers listed below.

- 1.- R.G.I.T., OFFSHORE SURVIVAL TRAINING CENTER,
352 King street, Aberdeen, AB9 2TQ, Gr.Britain.
 - 2.- PETANS, FLINT HOUSE
80 High street, Lowestoft, Suffolk, NR32 1XN, England.
(courses: SHHS, ADS & REFR, BA, FCC)
 - 3.- THE FLEETWOOD OFFSHORE SURVIVAL CENTRE,
The Nautical College, Broadwater, Fleetwood,
Lancs., FY7 BJZ, England.
- OR similar.

C.
O
U
D R
A S
Y E

T A B L E I

Ratio: Students per instructor

1st period 2nd period 3rd period 4th period

1	F D	16T	16M	16T	16M	16TK	16KS	16T	16N
2	F D	16T	16M	16T	16M	16T	16MK	16T	16K
3	A D	16K	16M	16K	16M	16KK	16KK	16KK	16KK
4	A D	16KK	16KM	16K	16KM	16KR	16KM	16K	16KM
5	A	16K		16KK		16KK		16KK	

6	D C	16+16 M		16+16 M		16+16 KS		16+16 N	
7	D C	16+16 M		16+16 M		16+16 M		16+16 K	
8	D C	16+16 M		16+16 M		16 KK		16 KK	
9	D	16 KKM		16 KKM		16 KKM		16 KKM	
10	B	16 K		16 K		16 KK		16 KK	

11	B A	16N	16K	16KK	16K	16KK	16KK	16KK	16KK
12	B A	16K	16KK	16R	16KK	16KK	16KR	16KK	16K
13	B A	16KR	16K	16R	16KK	16KK	16KK	16KK	16KK
14	E C	16K	16MK	16K	16MK	16P	16MK	16P	16N
15	E C	16P	16M	16P	16MK	16P	16MK	16K	16K

16	E C	16K	16MK	16P	16MK	16N	16KK	16K	16KK
17	F B	16T	16K	16T	16K	16T	16KK	16T	16KK
18	F B	16T	16N	16T	16KK	16T	16KK	16T	16KK
19	B		16K		16R		16KK		16KK
20	B		16KR		16R		16KK		16KK

Note: Abbrev: K=captain M=fireman P=physician
 S=nurse T=doctor R=radio-operator
 N=naval architect

T A B L E II

1st week	C	30 periods (x 2 =)	60 hours		
	F	11 periods	"	22	"
	P				
	N	½ period	"	1	"
	D	6 periods	"	12	"
	R	½ period	"	1	"
	A	1 period	"	2	"
2nd week	C	20 periods (x 2 =)	40 hours		
	F	11 periods	"	22	"
	P				
	N	½ period	"	1	"
	D				
	R				
	A	1 period	"	2	"
3rd week	C	44 periods (x 2 =)	88 hours		
	F	6 periods	"	12	"
	P	5 periods	"	10	"
	N				
	D				
	R	4 periods	"	8	"
	A	2 periods	"	4	"
4th week	C	30 periods (x 2 =)	60 hours		
	F	2 periods	"	4	"
	P	1 period	"	2	"
	N				
	D	8 periods	"	16	"
	R	3 periods	"	6	"
	A	2 periods	"	4	"

CHAPTER

V

Safety Courses in Greece

by

Christoforos Papatheofilou

GENERAL REGULATIONS OF ATTENDANCE

V.1. Scholastic time-table

The daily time-table is as follows:

1st period:	(90 minutes)	from: 08.15	till: 09.45
	1st break	15 minutes	
2nd period:	(90 minutes)	from: 10.00	till: 11.30
	Coffe break	20 minutes	
3rd period	(90 minutes)	from: 11.50	till: 13.20
	Lunch break	30 minutes	
4th period	(90 minutes)	from: 13.50	till: 15.20

In cases of afternoon and night overtime operation:

5th period	(90 minutes)	from: 15.20	till: 16.50
	1st break	10 minutes	
6th period	(90 minutes)	from: 17.00	till: 18.30
	Coffee break	20 minutes	
7th period	(90 minutes)	from: 18.50	till: 20.20
	last break	10 minutes	
8th period	(90 minutes)	from: 20.30	till: 22.00

note: The periods are 90 minutes long but for the theoretical lessons a five-minutes break after the first 45 minutes should be given.

V.2. Number of students in courses.

For the theoretical lessons the student numbers should not surpass 16, whilst for the practical les-

sons the lowest ratio (teacher/trainee) should be 1 to 8.

For groups taking the same syllabus consecutively, such as the case of C and D, on the 6th and 7th days, for theoretical lessons they may be grouped together with the maximum ceiling of 32 students.

Regarding course D, on the 8th and 9th days, the ratio (teacher/trainee) for these practical lessons should not be less than 1 to 6, for reasons of safety.

V.3. Attendance

Attendance is compulsory and on no account will absentees be excused.

If a student is absent he will be compelled to retake the course from the beginning in the next module.

The instructors would be requested to take roll, record it in a register and hand it in, at the end of the day, to the director of the training center.

When the course group is divided for practical lessons, the most senior of the instructors is responsible for taking roll.

V.4. Examinations

All courses are subject to examination.

Assessment is done on both practical and theoretical matters.

Whilst attending the course the students' conduct will be continuously assessed by the instructor who has to give in a report on the completion of the course but prior to written examinations.

A report on a "Passed/Failed" basis is sufficient but no student will be allowed to take the written examination if he has not passed the practical segment of the course.

In the case of failure in any of the written examinations a letter should be addressed to the director of the training center when the case merits it.

Upon receipt of the letter the director will call a meeting with the instructor concerned and two other instructors or one of the instructors and the most senior Coast Guard officer of the center.

Under no circumstances will a failure in the practical assessment be reconsidered.

V.5. Re-examination

Re-examinations will take place no sooner than 7 days later, but also not later than 15 days after a failed examination.

V.6. Certification

After successful completion of each course, a certificate of attendance will be offered.

On completion of the total module corresponding to his rank, the trainee should receive a certificate depicting the courses passed.

V.7. Trainees' obligations

The trainees are obliged to obey all the rules and regulations in force in the Greek Maritime Academies.

CONCLUSION

The increasing size and number of merchant vessels plying the world's seas has increased the potential for marine accidents and heightened the concern of both government and their respective administrations about marine safety.

Today more than 55,000 ocean-going vessels are employed in commerce around the world, being concentrated along the major seaways, in coastal waters, in rivers and in harbour areas. These ships at times cause congestion, which is not unlike that found around the busier airports.

With world population increasing and world trade growing, the number of vessels and the tonnage they convey will continue to rise as will the associated perils.

The training of personnel and the control of safety, are the key aspects on which the safety system in Greece should rest. Specialists are trained to work on ships in the higher maritime educational establishments. With passenger ships of high tonnage and speed and cargo ships of increased complexity, specialists having higher education are needed in command.

Before receiving the first marine diploma, cadets undergo sufficient practice on vessels. On assuming their first command post, junior officers should be under the careful eye of senior officers whilst being on watch.

The Greek merchant marine has being well provided with specialists, who are promoted to every command post fully in accordance with the national requirements. Thus for example, the service term from the first navigating

post to that of master, takes 10 to 16 years depending on the individual abilities of the candidate, the type of education he has undertaken, the kind of vessel, the company he is working for notwithstanding the minimum national respective regulation.

A clear cut system of maintaining knowledge at a contemporary level has been worked out in Greece. All navigators, engineers and radio operators undergo systematic professional and safety knowledge "check-up" in the disciplines of their specialities as applied to the post they occupy. Such a "check-up" is also required when an officer is promoted as it should be required if there is any case of a navigator or an engineer violating a rule or requirement concerning the safety of the crew and the vessel.

Every navigator and ship's engineer takes refresher courses at which they become acquainted with the new technology and methods of handling ships, including the use of indicators and relative computers, as well as some specialized ships. These courses are compulsory and any officer who fails to undergo the refresher course in time, can not be promoted to a higher post till he graduates successfully from the additional or refresher courses. The approach is just as strict with regard to radar simulator training in K.E.S.E.N. when required to attend.

When referring to training to ensure navigational safety and safety in general, it must be said that much attention is paid in the marine school syllabuses to fire fighting measures, to the development of skills for attaining ship seaworthiness, the use of all types of rescuing means and the techniques of rendering help to other vessels. It is obvious that these requirements dovetail

well with the clauses of the 1978 Convention of Standards of Training, Certification and Watchkeeping for Seafarers.

The ensurance of safety of the crews and vessels at sea is the main target in training personnel. The term "ensurance" as applied to Greek crews and vessels, covers a wide range of measures and duties of individual officials, as well as that of shipping companies and the respective ministry.

The functions of a ship's master, the main figure responsible for the ship's safety, are similar throughout the world and are well known. Therefore, the main attention is now paid to the foundation of the safety "itself" with the ship's master on the peak.

In Greece, state supervision over the mercantile navigation is entrusted to the Ministry of Merchant Marine which controls the observance of the national laws and international treaties relating to maritime shipping to which Greece adheres.

The shipping companies, the fleet's production units which are responsible for the execution of the laws and other regulations, including the entire range of aspects on navigational safety, are the direct executors of the ensurance functions. At every individual shipping company the solution of these problems is entrusted to a number of their departments, being operational, navigational, technical and that of communications. The Greek Coast Guard acts as the main organ for safety services as it works out the effect of navigational safety measures, as well as coordinates the work in this field in connection with the national marine educational system. Captain-tutors and

high officials specialised in this subject as well as C.G. officers make up the basis of a modern maritime education system for the Greek marine industry. A large part of this programme is covered by the "safety on ships" course.

Assisting new captains, perfecting the knowledge of experienced captains as well as participating in the investigation of accidents by popularization of the past experience, thus creating evolvement of measures to prevent accidents, are the main safety ensurance duties of these captain-tutors who undertake the responsibilities of tuition of general safety at sea.

A certain institute carries out research, elaborates projects on the rules of safety on board ships and other regulatory documents concerning navigational safety in a board range of aspects including questions are resolved on an international level.

Greece takes an active part in nearly all international forums dealing with the safety of crews and property at sea, being amongst the first to ratify important international agreements as the 1972 Convention on the International Regulations for Preventing Collisions at Sea, the 1978 Convention on Standards of Training, Certification and Watchkeeping for Seafarers, as well as many other relevant Conventions. The clauses of international treaties, of which Greece is a party, are reflected in the national regulatory documents. The demands placed on Greek ships as contained in these documents are, as a rule, higher than the international ones presently in force.

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APPENDICES

APPENDIX

Part 1

Safety Courses in Greece

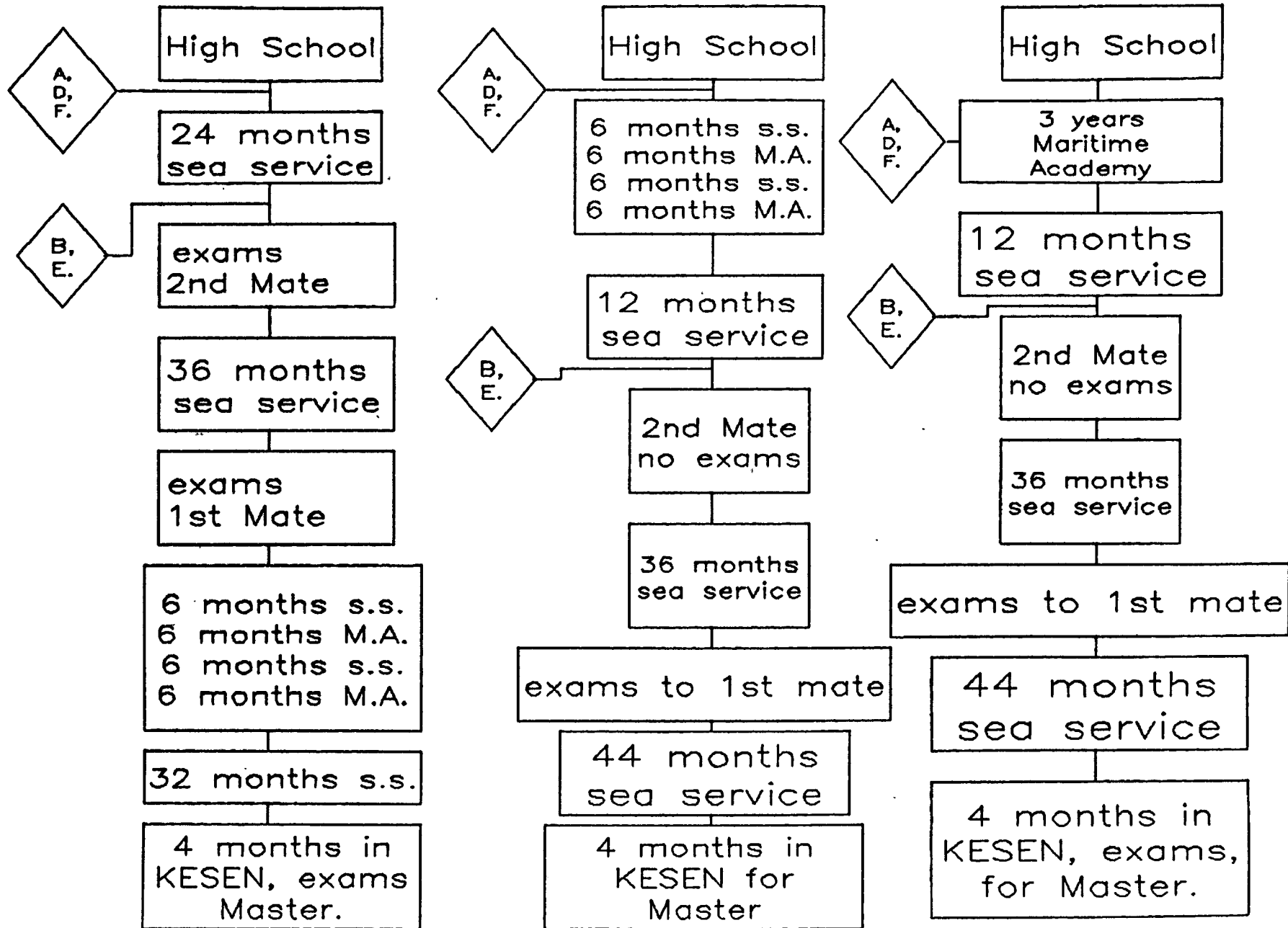
by

Christoforos Papatheofilou

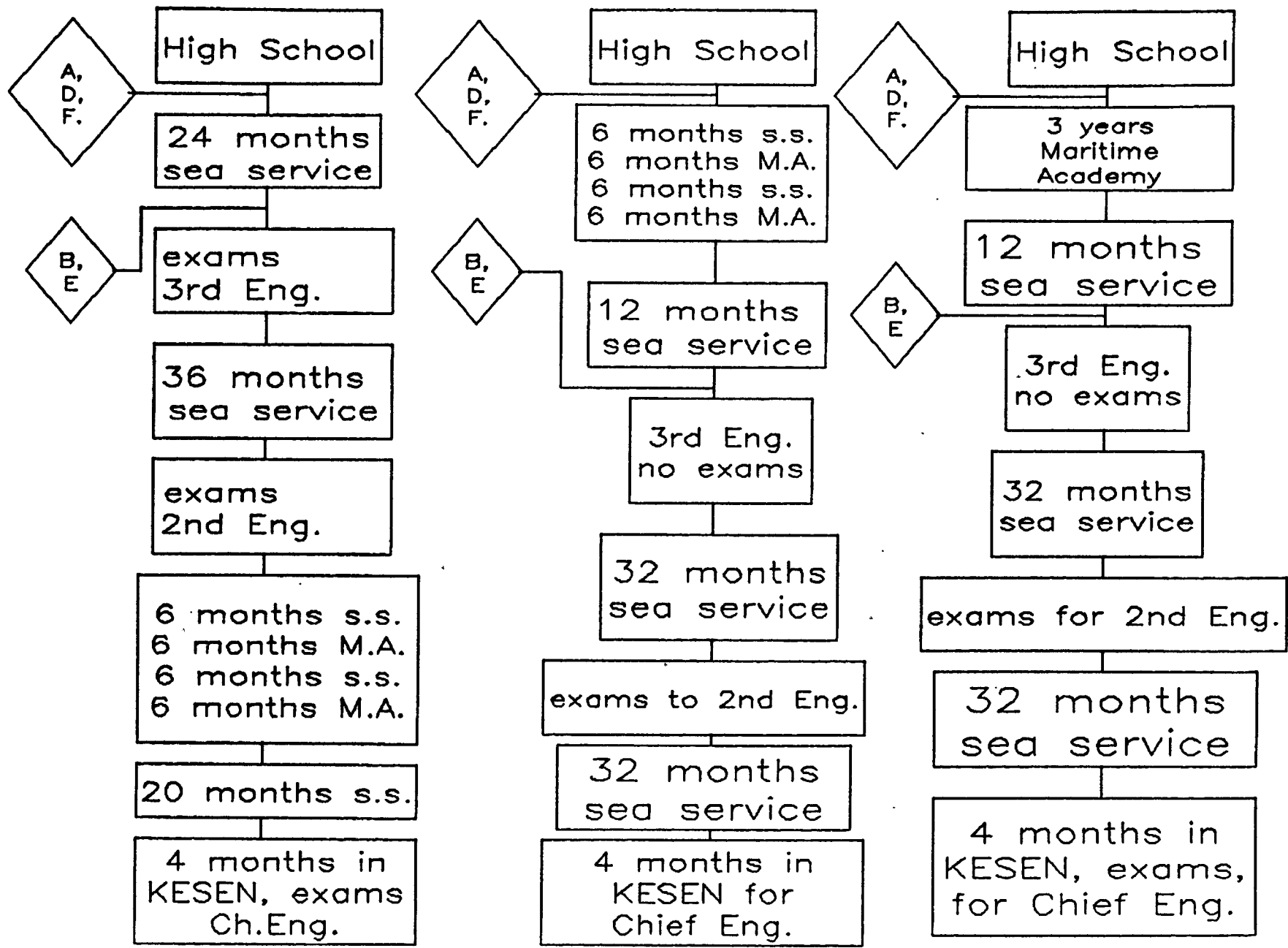
A P P E N D I X 1

In this appendix, five flow charts are shown in an effort to give a picture of the promotion requirements for Greek seafarers. Furthermore, the proposed times for getting the respective safety courses are indicated by giving the necessary course indicative letter.

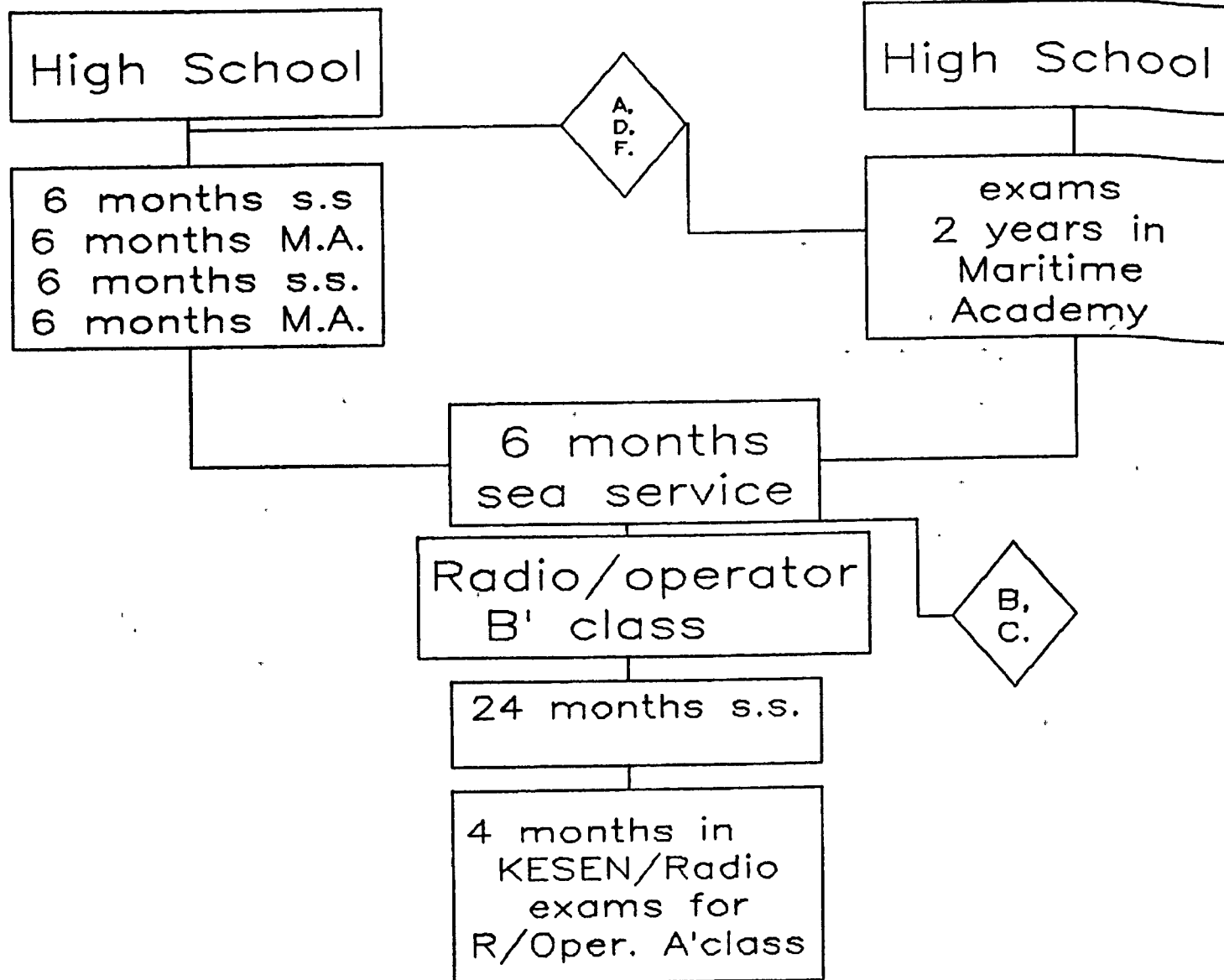
DECK OFFICERS



ENGINE OFFICERS

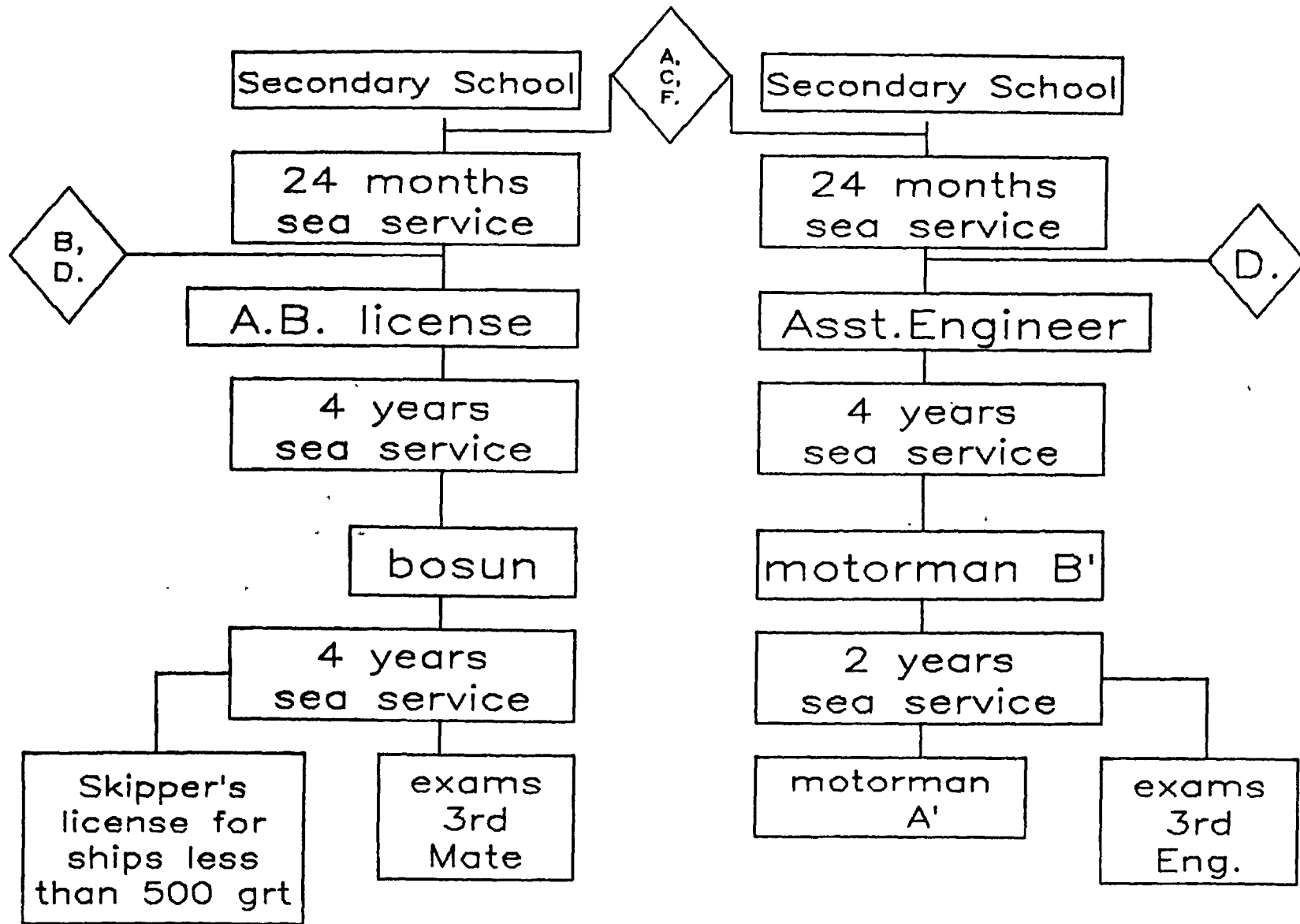


RADIO OPERATORS



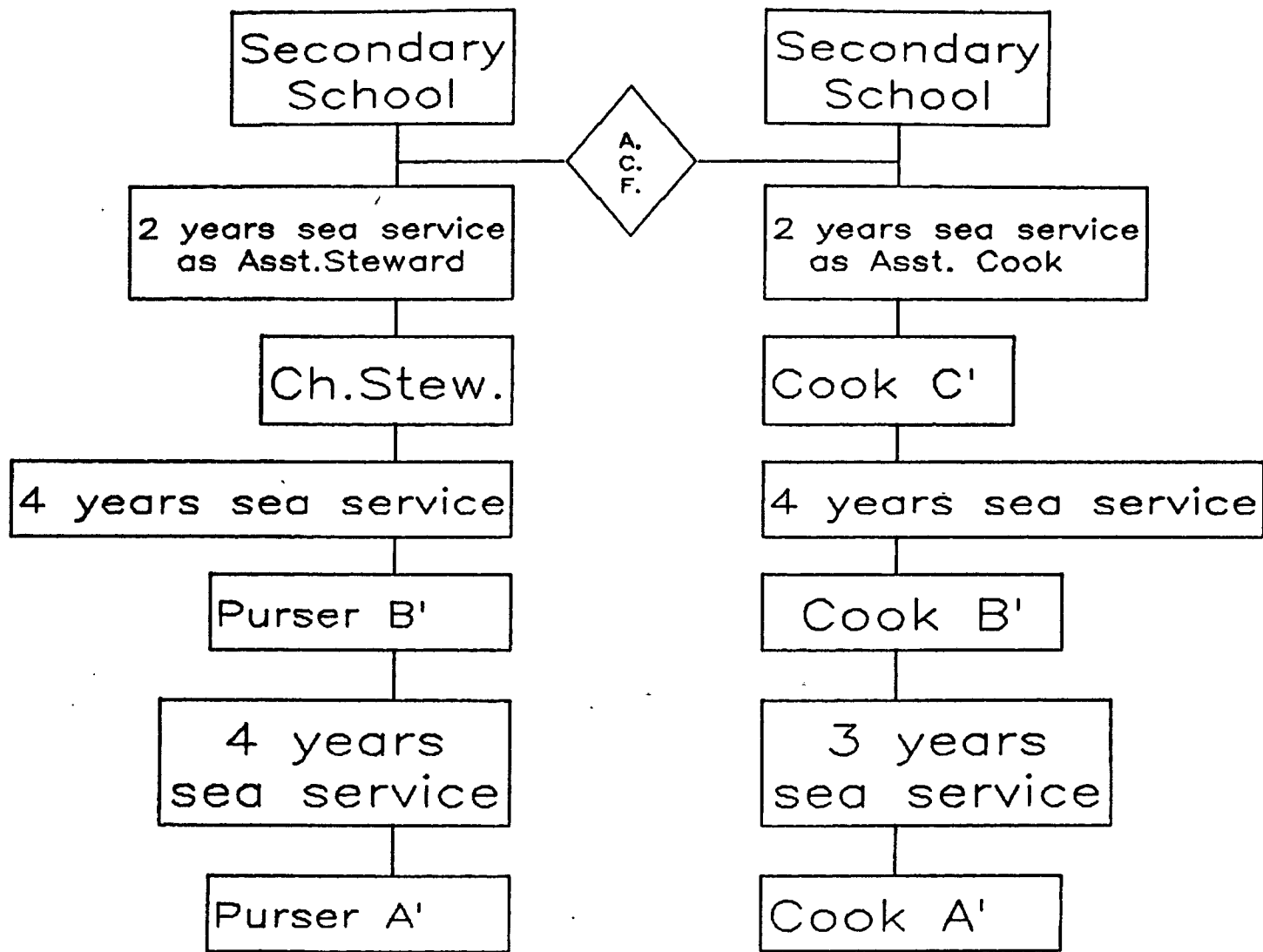
RATINGS

Deck and engine



STEWARD'S

DEPARTMENT



APPENDIX

Part 2

Safety Courses in Greece
by
Christoforos Papatheofilou

A P P E N D I X 2.

In the following appendix, six illustrations are presented.

In the first, a general arrangement plan of the existing and proposed installations is shown.

The second illustration is of a simulated boat deck with the necessary equipment.

The third plan is of the smoke room as it exists today. It is proposed that this smoke room will be used in the following manner:

The lower part, being simulated as mashinery space and to be used for fire extinguishing purposes and the upper part, which is simulated as accommodation, to be used for training in smoke diving and recovery of persons.

The fourth is a sketch of an oil spill tank and a simulated corner, so called "triedron", for the purpose of training mariners in extinguishing fires with various agents.

The fifth is a plan of the Training Center as it stands today. No changes are needed in the buildings.

The South and West elevations of the Training Center's buildings are shown in the sixth illustration.

ABBREVIATIONS

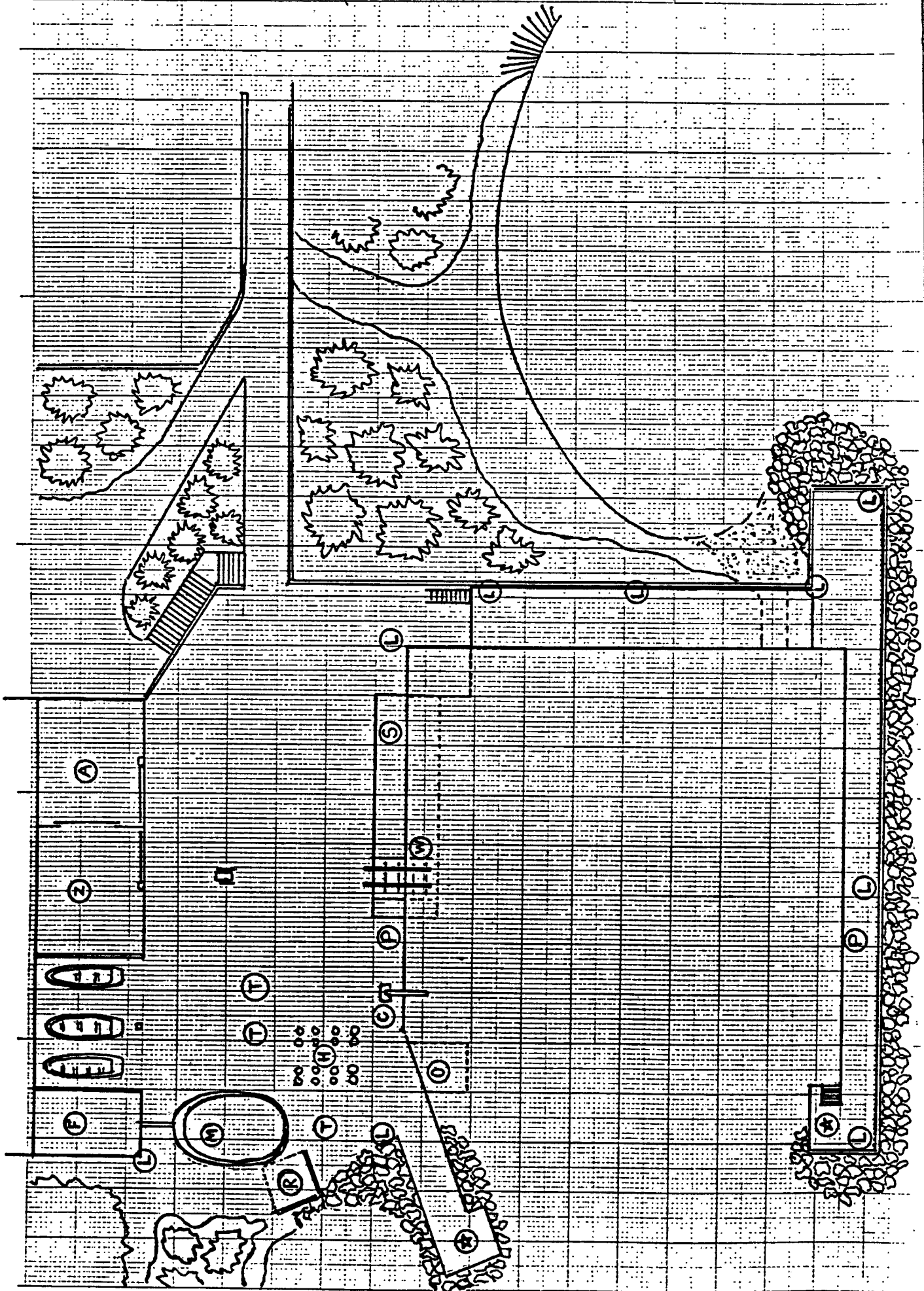
"A"	:	Classroom.
"B"	:	Winch.
"C"	:	Crane.
"F"	:	Storage room.
"L"	:	Light post.
"M"	:	Smoke room.
"O"	:	Place for the oily water separator.
"P"	:	Posts for emergency ship-shore transportation.
"R"	:	Triedron. (proposed)
"S"	:	Inclined dock.
"T"	:	Oil spill tanks.
"W"	:	Slipway.
"Z"	:	Workshop.
"★"	:	Marina's entrance lights.

GENERAL ARRANGEMENT PLAN

SCALE
1/500

Drawing

No. 1

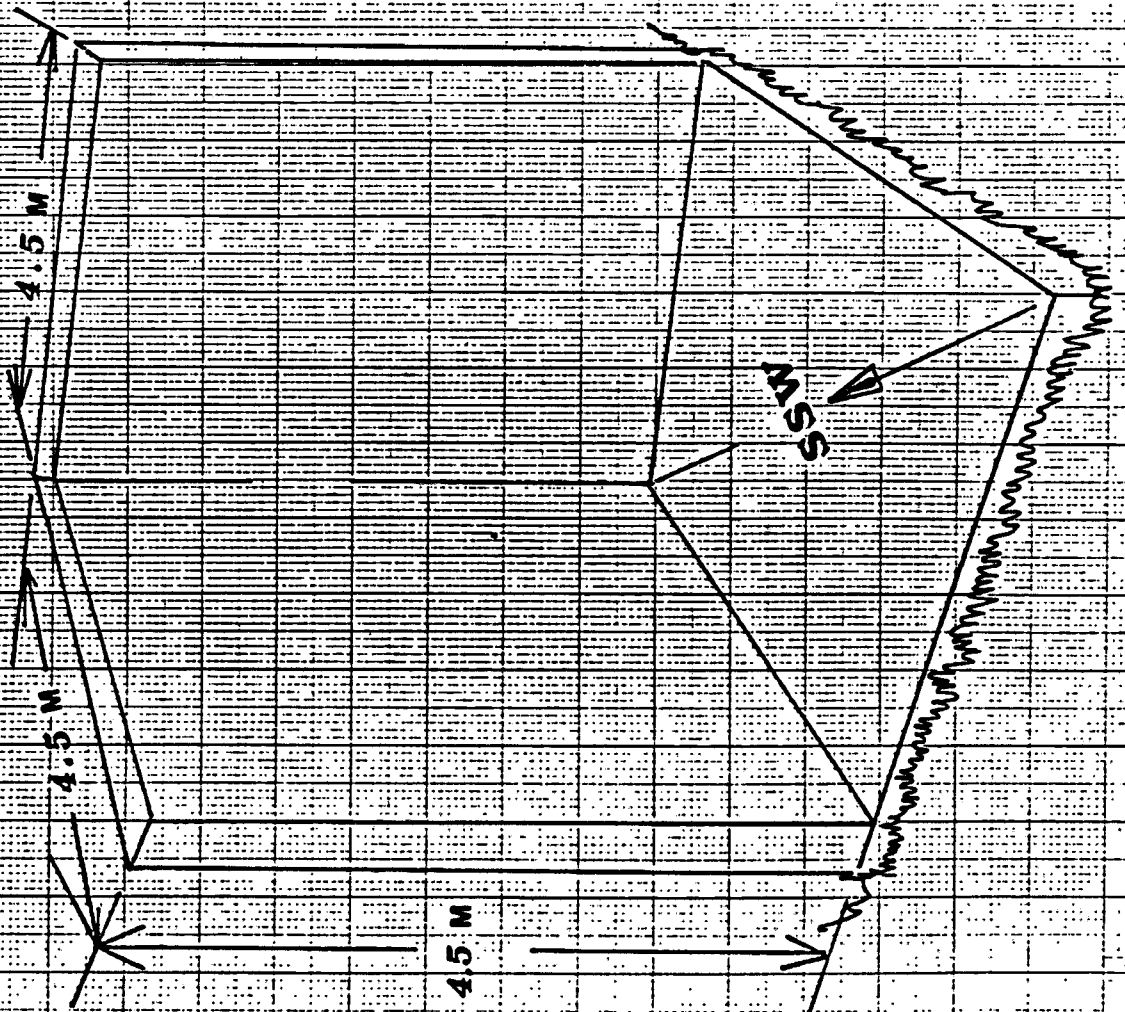
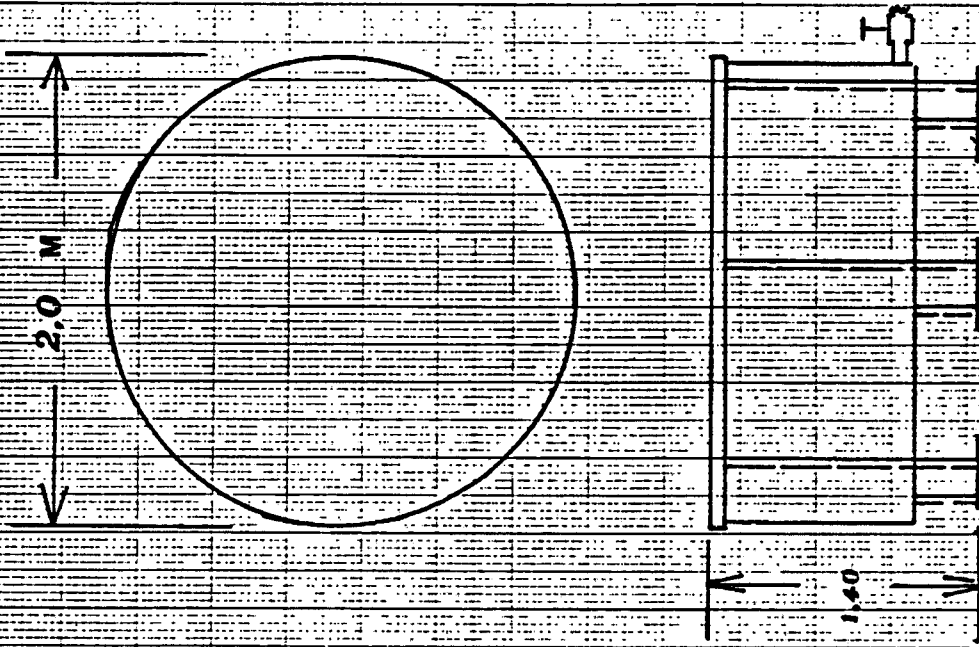


Drawing
No. 4

"TRIEDRON" and

Oil Burn Tanks.

SCALE

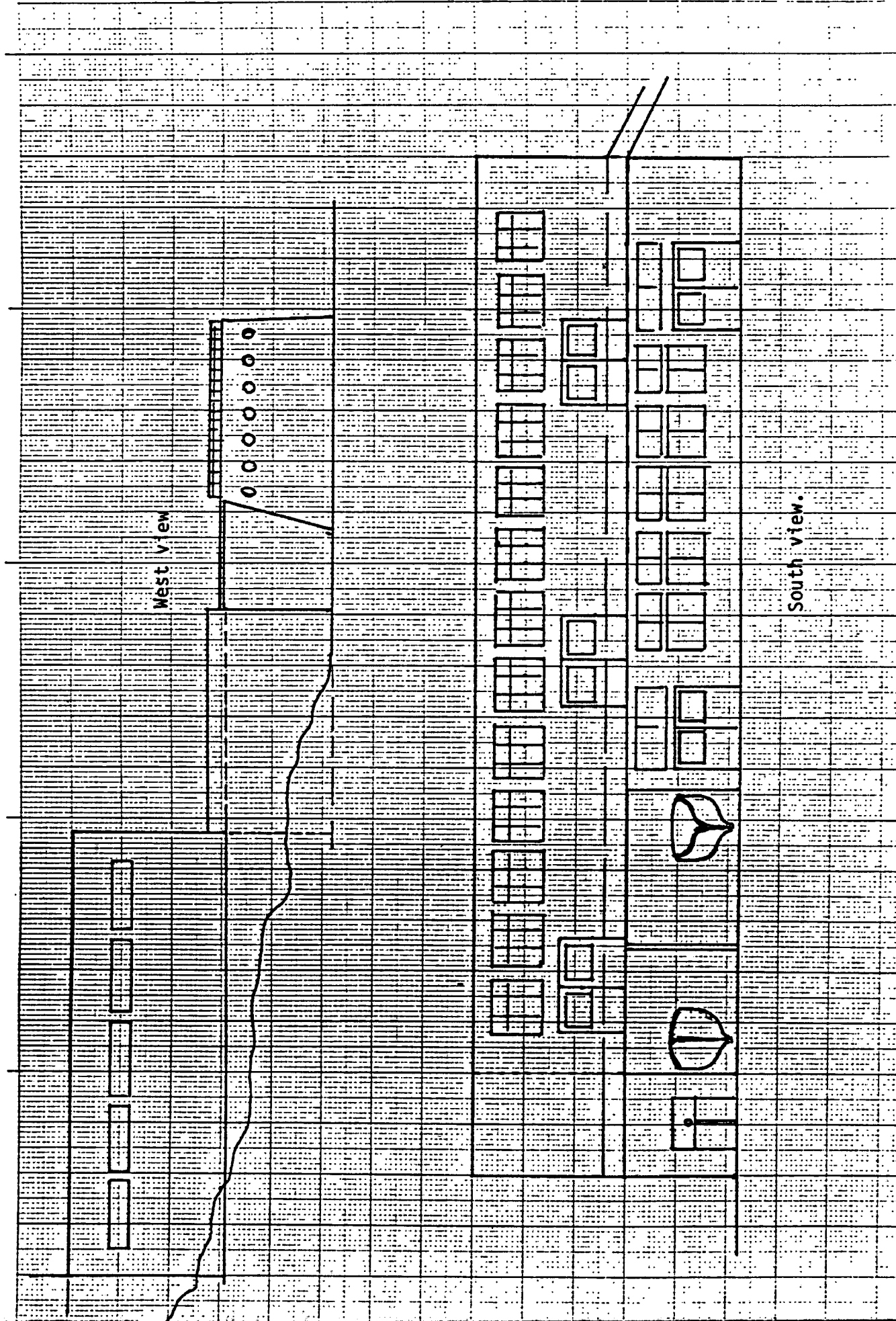


Drawing
No. 6

GENERAL ARRANGEMENT PLAN
of Main Building.
(West and South views.)

SCALE

1/200



APPENDIX

Part B

Safety Courses in Greece

by :

Christoforos Papatheofilou

AP.3.- EQUIPMENT NEEDED

3.1 For sea survival courses.

- 1 Plastic 30 persons 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 equipped in addition with a radio-telegraph 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 be made of aluminium or plastic.)
- 1 Inflatable liferaft (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 III, Part C, Section II, Reg. 32.2
- 2 Life jackets fitted with a light complying with the requirements of SOLAS III Part C, Section II Reg. 32.3 according Reg 21.3.2
- 1 Life buoy in accordance with SOLAS Ch.III Part C, Section Reg. 7.1 and Reg. 31.1
- 2 Life buoys equipped with self-activating smoke signals according to SOLAS Ch.III, part C,

Section II Reg. 31.3 as Reg 7.1.3 Part B Section I.

- 1 Lifebuoy equipped with buoyant life line as outlined in Reg 31.4
- 2 Immersion suits of any approved type according to SOLAS III Part C, Section II, Reg. 33
- 1 Thermal protective aid of any approved type according to SOLAS III Part C, Section II, Reg.34
- 10 Rocket parachute flares of any approved type according to SOLAS III Part C. Section III, Reg. 35
- 10 Hand flares of any approved type according to SOLAS III, Part C, Section III Reg.36
- 10 Buoyant smoke signals of any approved type according to SOLAS III, Part C, Section III, Reg. 37
- 1 Combined light/smoke marker for demonstration.
- 1 Line throwing apparatus of any approved type according to the SOLAS Ch.III, Part C, Section VII Reg. 49
- 1 Set "ship to ship" or "ship to shore" evacuation system, complete.
- 1 Set helicopter rescue belt with harness.
- 48 Raincoats of various sizes.
- 48 Pairs plastic high-boots.
- 1 6 meter jacob's ladder.
- 1 2 meter single boom crane for manouvering the life rafts, with a geared hand powered winch.
- 1 Electric powered winch to hoist the boats on the slip-way when repairs have to be done on them.
- 1 Shelter for storing the boats for maintenance and all the relevant necessary tools and equipment.
- 2 Portable radio-apparatus for survival craft, complying with the requirements of SOLAS Ch.

III, Part B, Section I, reg.6.2.1.1 and Ch.IV,
Part C Reg.14

7 Video tapes as follows:

DS2	2	This is your lifeboat	15 m.
DS5	106	Helicopter assistance at sea.	29 m.
DS14	276	Satellite lifeline	20 m.
DS15	297	SOLAS Chapter III	
Part 1.		Preparing for abandonment	17 m.
Part 2.		Abandonment by lifeboat	18 m.
Part 3.		Abandonment by liferaft.	23 m.
Part 4.		Techniques for survival.	21 m.

3.2 For firefighting courses

- 1 fire and smoke building complex.
The fire building is constructed of concrete and is equipped with the following:
 - 3 Old lathes 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 outlets, one of open water supply, and the other from a diesel powered fire pump.
 - 3 Sets of Emergency escape hoods, made from flame-retardant antistatic 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
 - 2 jet/spray
- 2 Sets nozzles : 1 three positioned with handle.
 - 1 three positioned turnable.
 - 1 foam producing nozzle.
- 1 Piece international sea-shore connection.
- 20 Pieces fireman's outfit according to SOLAS II-2 Part I, Reg. 17
- 40 Sets protective clothing including tunics, fire boots, gloves, overalls, helmets made of flame retardant material.
- 5 Electric safety lamps (hand lantern)
- 1 Axe.
- 5 25 meter fire-proof lifeline with hooks and harnesses.
- 1 Piece breathing apparatus with 20 meters, 12 mm. long pipe and relative air pump with smoke helmet and bellows.
- 1 Piece 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 Piece 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 for safety purposes.
- 1 Set Rescue pac for demonstration and for safety purposes.

- 1 kit first aid.
- 2 Mechanical foam branches.
- 1 Piece high or medium expansion foam generator.
- 1 Piece foam compound.
- 2 Sets standpipes, 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.
- 12 Pieces 5 kg carbon-dioxide 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 ensure of a slight positive pressure which prevents the ingress of contaminants into the mask in the case of unforeseeable leaks.
- 1 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 firefighting 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 grow 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.

15 Pieces video cassettes or films as follows:

- Use of compressed air breathing apparatus (caba)
- Fire-fighting at sea. (50 min.)
- Fire chemistry. (30 min.)
- Fire: a hazard. (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.)
- ARSDN alert. (20 min.)
- Fire below. (25 min.)
- The uninvited guest. (25 min.)

X Pieces of an assortment of hand-held fire extinguishers, cut-aways for demonstration and illustration, assorted fire hoses, cut-away for clarity.

3.3 For "First Aid at Sea" courses

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 70 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 paramedics rescue pac.
 - 10 sets of every type of bandage.

3.4 Miscellaneous.

- 1 Slide projector.
- 2 Overhead projectors.
- 1 8 mm film projector.
- 1 White screen (2 m. x 1.8 m.)
- 1 TV set, colour, 27".
- 1 Video recorder-player.

3.5 Library.

The following books should be included at the library of every training center:

"Fire-fighting equipment and their use on ships." VICTORY C.

"Fire aboard" RUSHBROOK F.

"Fire appliances" KEENAN G. L.

"Accidental Ignition and Explosions of Gases on Ships" BURGOYNE J.H.

"Research in fire fighting and fire protection in ships." NASH P. and ASHTON L. A.

"Fire protection and fire fighting in ships." MURRAY SMITH D.R. and WILLENS A.T.

"The development and operation of an Inert Gas system for oil tankers." DAY C.F. and PLATT E.H.W.

"Fire boats and ships fires." HMSO

"Bulk carbon dioxide smothering systems." VORONOF B.

"Testing of foam smothering systems in tankers." VOSTRYAKOV V.I.

"Principles of fire protection." PERCY - BUGEE

"Fire-related codes, laws and ordinances" VINCE H.

"Principles of fire protection chemistry." TUVE R.L.

"Fire suppression and detection systems." JENSEN R.

"The chemistry of fire." MUIR M.R.

"Combustion." GLASSMAN I.

"Fire and flammability handbook." SCHULTZ N.

"Detection and measurement of hazardous gases." CULLIS A.G.

"Flame and combustion." BARNARD J.A.

"Flames, their structure, radiation and temperature." GAYDON A.G.

"Limits of flammability of gases and vapours." COWARD H.F.

"Combustion and mass transfer." SPALDING D.B.

"Combustion and flame." HOMANN K.H.

"An introduction to fire dynamics." DRYSDALE D.

"Explosions." BARTKNECHT

"Fire-fighting aboard ships." (Volumes I and II)
STAVITSKIY M.G.

"Fire Protection Guide on Hazardous Materials."
NATIONAL FIRE PROTECTION ASSOCIATION, BOSTON, USA.

"Cargo fire fighting on liquefied gas carriers."
SIGTO

"Manual of firemanship." (12 Volumes) HMSO

"Marine fire prevention, fire-fighting and fire safety."
BRADY R.J.

"Offshore fire fighting manual." LORNE and MACLEAN

"Ships fire fighting manual." LORNE and MACLEAN

"Accident prevention onboard ship at sea and in port"
ILO

"Casualties to vessels and accidents to men." HMSO

"Code for safe working practices for merchant seamen"
HMSO

"Financial risk management in the shipping industry."
GRAY J.

"Guide to helicopter / ship operations ICS

"Hypothermia. Ashore and afloat." JOUCUION B.

"Introduction to safety at sea." BULL J.W.

"International manual of maritime safety."
LORNE and MACLEAN

"Man and accidents offshore." SUTHERLAND V.J.

"Marine personnel safety manual." LORNE and MACLEAN

"Marine emergencies." MEISEL T. and MILNE P.

"Practice of ocean rescue." SANDERS R.E.

"Ship safety handbook." LLOYDS OF LONDON

"Survival at sea." WRIGHT C.H.

"Survival techniques." LORNE and MACLEAN

"Survive the arctic sea." BUZZA R.

"Survive the savage sea." ROBERTSON D.

"Maritime search and rescue organisation." HMSO

"Safety and survival at sea." KENNETH L.

"Sharks and survival."	GILBERT P.W.
"Abandon ship."	NEWCOMP R.F.
"Global maritime distress and safety system."	IMO
"Survey of life saving appliances."	HMSO
"The U.S.C.G. Chemicals' Manual."	U.S.C.G.
"Advanced first aid afloat."	EASTMAN P.F.
"Hypothermia."	POZOS R.S.
"Handbook of nautical medicine."	GOETHE W.H.G.
"The ship captain's medical guide."	HMSO
"International Convention for the Safety of Life at Sea." (1986 consolidated edition)	IMO
"Emergency Procedures for Ships Carrying Dangerous Goods (Ems)."	IMO
"Facsimile of labels for the carriage of dangerous goods."	IMO
"International Maritime Dangerous Goods Code."	IMO
"Medical First Aid Guide for Use in Accidents Involving Dangerous Goods." (MFAG)	IMO
"Code for Existing Ships Carrying Dangerous Chemicals in Bulk."	IMO
"Code for Existing Ships Carrying Liquefied Gases in Bulk."	IMO
"Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk." (BCH Code)	IMO
"Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk."	IMO
"Code of Safety for Diving Systems."	IMO
"Code of Safety for Fishermen and Fishing Vessels."	
"Code of Safety for Special Purpose Ships."	IMO
"Fire Test Procedures."	IMO
"Index of Dangerous Chemicals Carried in Bulk."	IMO
"Inert Gas systems."	IMO
"International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk."	

(IBC Code)	IMO
"Recommendations concerning Fire Safety Requirements for Cargo Ships and for Passenger Ships Carrying not more than 36 passengers."	IMO
"Pocket Guide to Cold Water Survival."	IMO
"Global Maritime Distress and Safety System." (GMDSS)	
"Search and Rescue Manual."	IMO
"International Code of Signals."	IMO
"International Conference on Training and Certification of Seafarers."	IMO
"Merchant Ship Search and Rescue Manual." (MERSAR)	IMO