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Establishment of seafarers training centre in Honduras

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ESTABLISHMENT OF SEAFARERS TRAINING CENTER IN HONDURAS

BY

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

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

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ABSTRACT

Public and political interest in quality, safety and the environment is growing steadily throughout the world. This increases the pressure on all organizations with responsibilities in the maritime field, at the same time underlines the need for organizations like Maritime Training Centers.

This dissertation describes the real situation of the seafarers' education in Honduras and the need for establishment of an institution that meets the global requirements.

The description of minimum physical set up of the Training Center can be found in chapter two; the general course outlines are introduced for the General Purpose Rating and for the Catering Rating based on syllabuses already in progress in reputable Training Centers in Europe and the USA.

I believe the success of the future years in our Maritime Administration will be due to the fact that the commitment to quality of education has been reached. This will give to all those who work for the development of our country great satisfaction and confidence in the future.

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CHAPTER ONE

INTRODUCTION TO THE PROJECT

1.1 - BACKGROUND

The Republic of Honduras is located in the middle of the Central American isthmus, among the Caribbean Sea to the North, Nicaragua to the East, El Salvador and Nicaragua to the South, Guatemala and El Salvador to the West. The total land area is 112,088 sq. km., with a coastline of 820 km. The population is about 5,000,000 (five millions). The capital is Tegucigalpa. Honduras became an independent nation on September 15, 1821 (from Spain) . Basically the economy is based on the export of agricultural products like: bananas, coffee, lumber, meat and also sea food like fish, lobster, crabs and shrimps. The major trading partners on exports are: 50% U.S., 17% Europe, 10% Japan. Budget: income 589,000,000 U.S. dollars; expend: 861,000,000 U.S. dollars. Monetary unit: lempira (5.4 lempiras = 1 U.S. dollar).

As can be seen from these figures, the economic situation of the country is far from a healthy one. I attribute the situation to the lack of technology that the country is facing as a result of not having a good education system. Education is an economically and socially productive investment. In the country, it is financed and provided predominantly by the government. The expansion of education therefore depends on fiscal resources. In recent years, however, adverse macroeconomic conditions and keen intersectoral

competition for public funds have reduced the government ability to continue expanding education. At the same time, the potential contribution of households are limited by current financing arrangements. In our case, that the population is growing rapidly (100% in 20 years), enrollment ratios, particularly in primary schools, might even decline and thus reverse achievements in the development of education.

Evidence also suggests that the resources are not being used in schools as efficiently as they might be. Public spending is channeled to schools according to standard funding formulas that do little to encourage efficient use. Staffing rules, pay scales, and allocations for other school managers are only remotely accountable to the students and their parents, they have little incentive to find the most cost-effective way to provide the type of education families desire.

Offering across-the-board subsidies to the students of all academic background is inequitable as well as inefficient. Although the country provides free education, talented students from poorer homes still find hard to enroll because they cannot afford to forgo income or to pay for textbooks, transport, uniforms, and incidentals. The lack of credit market for education makes this problem worse. Since poorer students cannot borrow against their future income to finance their current education, many have to drop out. Often, their places are taken by others who are less motivated and less prepared academically.

The private universities and schools existing in the country are playing an important role in raising the educational level, but unfortunately the access to those

institutions are limited to those with a medium to high standard of living, and these groups conform the minority of the country's population.

To contribute to the cultural and socioeconomic development of my country has always been the principal motivation in my career. The necessity to reorganize the education system is something, that every passing day, is becoming more and more dominant in order to be able to compete in this evolving world.

Honduras, even though it doesn't have a National Merchant Fleet of great size, it has many small enterprises that operate small vessels trading locally and internationally. However, the National Fishing Fleet is one of the largest in Latin America.

The Maritime Administration in Honduras has been concerned for some time about deficiencies in the training field for Honduran seafarers. Indeed training is seen by the Administration as possibly the biggest deficiency faced by the seafarers. Because of the technological development in shipping in the past two decades and the consequential change in manning methods there has been a vast investment in equipment onboard and an even bigger investment in new ships, all of it needing continuous and effective maintenance.

Taking into account the aforesaid, the Administration has considered the idea of establishing an institution that qualifies Honduran seafarers in conditions that enable them to comply with the requirements established by I.M.O.'s STCW Convention.

The institution has to be one of prestige, backed up by

the Administration and the Government, having in mind that we have 27,000 seafarers registered and thousands more who may decide to join the community.

The intention of this project is to create the basis for a further study in greater detail that allows the establishment of an educational institution according to the needs.

1.2.- PROJECT AIMS

1.2.1 To qualify Honduran seafarers to serve in any fleet of the world with the same job opportunity as anyone else.

1.2.2 To contribute in achieving the IMO main objective of " Safer Shipping and Cleaner Oceans".

1.2.3 To ensure the continuous training of personnel for seagoing employment, with both national and foreign flag merchant fleet.

1.2.4 To ensure that those trained under the auspices of the maritime training program, shall endeavor to make meaningful contributions towards the advancement of the maritime sector in the nation's total development scheme.

1.2.5 To acquire self-sufficiency, regarding training and qualifications of the available manpower.

1.2.6 To expand the educational horizon of the people, and to prepare the youth to work in conjunction with the Honduran Navy in time of emergency.

1.2.7 To award Diplomas and Certificates according to the academic requirement of the institution.

CHAPTER TWO

ORGANIZATION, ADMINISTRATION AND PHYSICAL SET UP

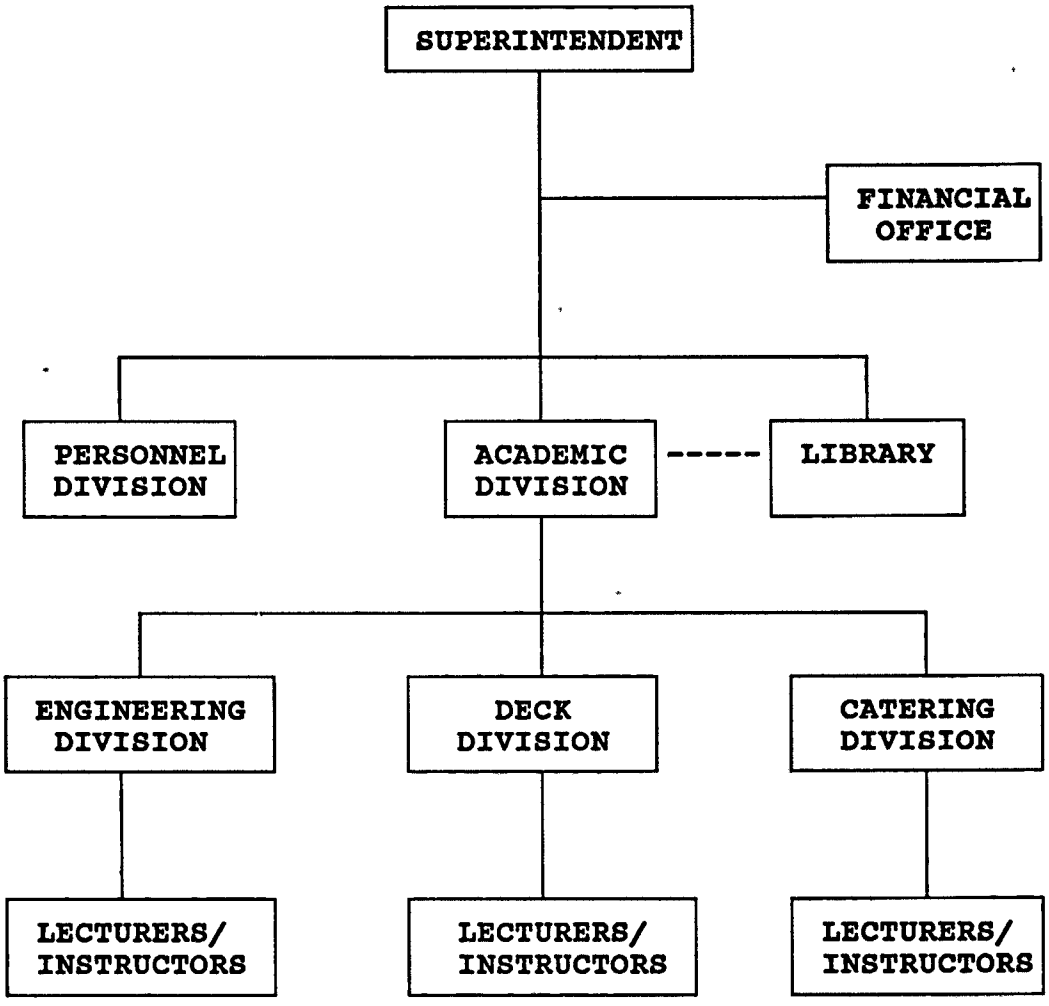
2.1 ORGANIZATION

" The difference between a whale boat full of naval recruits all shouting directions and pulling at random and an eight-oared Navy shell rowing strongly down the river is, first of all, a difference in organization. Certainly training, experience and other factors play important parts, but the first objective of anyone teaching the recruits how to row is to get them organized. In the case of the whale boat, appointing a coxswain and a stroke would be the first step in establishing a chain of authority and responsibility."

John V. Noel, J.R. (1982, p.35)

The process of organizing consists if determining what activities are necessary for any particular major purpose, and then arranging the corresponding duties in a pattern that permits the efficient flow of responsibility and authority through the individuals subsequently assigned.

The following is the proposed organization for the Seafarers Training Center:


SUPERINTENDENT
FINANCIAL OFFICE
PERSONNEL DIVISION
ACADEMIC DIVISION
LIBRARY
ENGINEERING DIVISION
DECK DIVISION
CATERING DIVISION
LECTURERS/ INSTRUCTORS
LECTURERS/ INSTRUCTORS
LECTURERS/ INSTRUCTORS

2.2 ADMINISTRATION

Administration is the act of managing, supervising and controlling. It is a broad term and, applied to a school, it includes all the activities of the students: their training, inspection, discipline and welfare. A grasp of essential principles of administration, should help the Superintendent and the Division Officers in developing the art of efficient supervision.

POLICY

" Administration from a division officer's viewpoint is accomplished in three general ways: by policy, by procedure, and by personal supervision."

John V. Noel (1982, p.56)

Noel goes on saying that *" policy is a statement of intent, a statement of what action will be taken under certain circumstances."* Most of the important policy concerning the Seafarers Training Center will be established on a higher level. However, in many small ways, a division officer can establish his own. Whenever possible, policy should be in writing and should be made known to all hands, particularly to new personnel.

PROCEDURE

Procedure is concerned with how the division is managed. How will a person or a group perform a particular task? What will their responsibilities be? In what order will they act? Established procedure, like policy, simplifies the daily problems of managing a group. This assumes, of course, that the division has been properly organized.

Procedure should be simple, yet complete, and should be stated in writing.

PERSONAL SUPERVISION

This is by far the most important method and is the one most often neglected by division officers who confuse paperwork with leadership.

A division officer must, first of all, maintain contact with his personnel, know where they are and what they are doing. He must know their attitudes, feelings, hopes, desires, fears and worries. He must know these things, not so much individually as collectively. People may behave quite differently under the same circumstances. These human factors are a division officer's primary administrative responsibility. Divide the paperwork among the assistants and seek every legitimate short cut. Concentrate on items of importance.

I wanted to touch these basic administrative principles, because in the past I have seen good projects fail because of wrong administration as a result of negligence, or lack of knowledge.

Any project that is intended to be put in operation requires good planing and more important good implementation. This drives me to suggest the basic requirements that has to be met by the candidates to fill the positions as Superintendent, Division Officers, lecturers and instructors.

STAFF ENTRY QUALIFICATIONS

A. SUPERINTENDENT

- Higher Maritime Education Diploma
- Minimum of ten years sea-going experience
- To be actualized with the different IMO's Conventions and Regulations
- Fully bilingual: English / Spanish

B. ACADEMIC DIVISION OFFICER

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

C. DECK DIVISION OFFICER

- Higher Maritime Education Diploma (Nautical)
- Minimum of five years sea-going experience
- Fully bilingual: English / Spanish

D. ENGINEERING DIVISION OFFICER

- Higher Maritime Education Diploma (Engineering)
- Minimum of five years sea-going experience (engineering officer)
- Fully bilingual: English / Spanish

E. CATERING DIVISION OFFICER

- Minimum of five years sea-going experience (catering division)
- Cook Certificate
- Fully bilingual: English / Spanish

F. FINANCIAL DIVISION OFFICER

- Logistic officer
- Minimum of three years experience as financial officer

G. SUPPORT TO EDUCATION DIVISION

- Minimum experience of one year on similar library
- Fully bilingual: English / Spanish

H. INSTRUCTORS OF LABORATORIES

- Technical Diploma
- Minimum experience of ten years onboard a general cargo ship
- Fully bilingual: English / Spanish

I. LECTURERS

- Higher Education Diploma
- Minimum experience of three years teaching in technical institutions

J. SECRETARIES

- Diploma
- Fully bilingual: English / Spanish

2.3 BUILDINGS AND EQUIPMENT

Taking for granted that the Honduran Navy will donate the land located at Km. 6 road to Omoa, Puerto Cortes, it must be stressed that educational and architectural staff will have to work harmoniously to produce the best possible general outlay.

A. ADMINISTRATION

The administration building of the STC should hold the following offices:

- Superintendent Office
- Academic Division Office
- Personnel Division Office
- Financial Division Office
- Deck Division Office
- Engineering Division Office
- Support to Education Division Office

B. CLASSROOM BUILDING

The classroom building should have at least four classrooms, designed to hold at least twenty students, equipped with sliding blackboards, projection screen, air-conditioning.

C. LIBRARY

The aims of the library will be to support the needs of the institution's teaching and students, also to serve the national marine industry. Such a collection will include, among other volumes, periodicals, newspapers, tapes, video tapes. Though subjects dealt with in the STC will basically be marine, electrical and electro-nic engineering, nautical science and radio, it will be advisable to include material on management finance, education, economics, law, etc., as all disciplines embody these subjects for fuller application of the discipline. Someone could say that a Training Center for Seafarers does not need such a variety of books with that level, but the intention is that this STC will be the

base for the building of the Maritime Education in my country.

D. DORMITORIES BUILDING

The student accommodation building has to be functionally designed and should be constructed of strong durable materials. The design should consider as a minimum:

- Four dormitories of twenty persons capacity each
- Television room
- Games room
- Lecture room
- Two bedrooms for officers

E. - CHEMISTRY AND HAZARDOUS MATERIALS

Chemicals and their reactions form a basic part of the marine industry: from chemicals being transported, through chemical corrosive effects on structure to the treatment of fluids like boiler water and sewage. For maritime professionals to deal effectively with this chemical field, the basic understanding should be acquired, which implies a chemical laboratory.

The chemistry laboratory can comfortably double up as the hazardous material laboratory, as both are basically dealing with chemicals. Exhausting of noxious fumes and mists should be arranged from the whole laboratory and specifically from the hazardous chemical protected experimenting areas.

Drenching facility (shower) should be provided in the chemistry laboratory for total showering of the body in case of a chemical spill or splash.

F. - PHYSICS

This laboratory should be equipped in mechanics light, sound and electromagnetism. Different voltage sources may be required.

G. - ELECTRICAL REFRIGERATION

Electricity is the most common means of transporting auxiliary power from one point to another on marine installations. Despite the good that this form of power supply is, it is very dangerous (fatal) if not properly handled. It is therefore a must to give practical training in this area before a mariner graduates from the STC.

The electrical laboratory should have AC and DC motors and generators. A switch board for power distribution should be found here. It may be a good idea to have some of the motors and generators sectioned and others with glass windows for viewing. The switch board, whether dead or live front, must be visible as well. Transparent material should be used for panelling.

Some household electrical equipment should be here. Different wire sizes and insulation materials must be available.

Electrical converters, ammeters, voltmeters, electrical tools, 12 V and 24 V batteries banks (Marine use) and independent panels of circuits should be available in quantities that 10 students can have the opportunity to practice at the same time.

Concerning the refrigeration section, freon and ammonia plants should both be represented as they will give the trainee a good basis to work with any of the other refrigerants.

A minimum of two working models consisting of compressor, condenser, evaporator and expansion value should be provided. In addition, mimic board display units of each component of the working model should also be installed.

A three room cold store with refrigeration machinery should be installed. They may be a one-ton capacity room at zero degrees, a three-ton at minus fifteen degrees and a six-ton at minus forty degrees centigrade. An ice making machine with a per day capacity of half a ton of ice will help students understand the principles involved in ice protection.

Changing arrangements should be made on each plant which will imply changing equipment. Charging hoses nipples, gauges, weighing scales, vacuum and air pumps should be stocked. Spanners, extractors, flaring tools, pipe wrenches and ratchets for special valves are some of the tools to be arranged in the refrigeration laboratory.

H. - ELECTRONICS LABORATORY

This laboratory is basically for circuit building monitoring and control. Various board for mounting demonstrative circuits should be installed per student station. A wide range of resistors, capacitors, reactors and other circuit building components for basics should be made available.

Power supply with a range for electronic work must be provided. Each student station must have a power insolation switch. These should be provision for power and function generators. Oscilloscopes, counters, multimeters and other measuring devices should also be installed.

I. - ENGLISH LABORATORY

For the language part, there should be an instructor's console controlling the various student consoles which should be housed in cubicles. Each station should have a tape recorder / play back with controls. Earphones and microphones with hook ups may complete the set. The instructor should have the option to address the whole class or individuals and control replies to the same effect. The cubicles should be numbered for identification purposes.

A writing board, overhead projector and screen should be installed in this room.

J. - CONTROL WORKSHOP LAYOUT

A large central workshop will need to provide a wide range of mechanical, electrical and other services for the school's equipment stock, and these should be organized and laid out following good, practical principles.

1. The first of these is **segregation** of the different activities: specialist separated - off areas or "shops" are needed to accommodate engine and transmission

overhaul, machining, fabrication and welding, foundry work, electric motor and component overhaul, and seamanship work. These activities must be kept separate so that they do not interfere with each other.
A control workshop maintaining equipment used in training centers is likely to need to provide the following facilities, services and amenities:

1.- Workshop manager's office
2.- Administrative office
3.- Routine desk
4.- Supervisor's office
5.- Meeting room
6.- Resting room
7.- Personal lockers
8.- Shower, WC
9.- Tools store
10.- Electrical maintenance area
11.- Engine reconditioning area
12.- Steel and fabrication area
13.- Seamanship working area

2. The second principle of good workshop lay out is **integration:** all the equipment, tools, spare parts and supporting facilities required to carry out a particular maintenance task must be located close to the work area. Each area or "shop" must be as self - contained as possible, to avoid delays in collecting tools, etc. for the job.

3. The third principle is good **space utilization** - making best use of the available ground floor sufficient for maintenance equipment (portable benches, jacks, etc.) to be moved in. Vertical space should be exploited by installing storage racking and by locating offices (for

managerial, supervisory and clerical staff) and amenities above workshop floor level wherever possible.

4. A fourth principle is **sensible location** : activities should be located so as to permit a logical flow of work during training in maintenance sequence. Where possible drive-through should be provided for, with doors in opposite walls. This makes it much easier and less dangerous to manoeuver aids to training equipment into and out of the building. The doorways must be big enough for the tallest and widest equipment envisaged to be maintained in the workshop, and fitted with roller doors which can be opened just high enough to suit the work being done.

5. The third principle is **safe working:** the work shop must be planned to be as safe as possible to work in. Incompatible activities should be separated to avoid interference and danger. Curtains are useful for segregating dangerous activities, and walkways and safety rails need to be installed around the stairs and high working platforms. Firefighting equipment must be located wherever there are potential fire risks. Floors should be easy to clean (all oil spillage must be removed immediately) and provide with a non.slip surface.

K. - WORKSHOP SERVICES AND FACILITIES

Among the many services that need to be installed at the workshop is a steam or high-pressure water cleaning apparatus, so that parts or all of a piece of equipment can be thoroughly cleaned before being worked on, and, indeed, at regular intervals during its working life, to keep it in good condition. All workshop buildings also

need good general lighting, as well as additional 'spot' lighting for individual work areas, benches and machine tools. A compressed air supply should be provided, with outlets at appropriate work points, and a ring-main electricity supply must be installed for portable and mounted tools and machines. Hand-tools should be powered from a low-voltage main.

The workshop also required to be fitted with such lifting devices as overhead crowns and portable hoists for safety lifting the heaviest components and assemblies into and out of the equipment and moving them around the workshop bays.

Workshop equipment

The range of equipment and tools needed in the workshop will depend on the type of work undertaken there and the amount of trainees per period.

Since the training will include carry out fabrication and machining, such machine tools as universal lathes, shapers, vertical and horizontal milling machines, welding facilities, pedestal drills, and reboring, honing, crankshaft, grinding and line boring machines will need to be available.

Another range of equipment needed includes such test and measuring equipment as pressure gauges, test pumps, micrometers and gauges.

Hand tools are, of course, of fundamental importance for the training of maintenance workers, and a crucial aspect of workshop management is the way these are distributed to the trainee. There appears to be three general

approaches. In many training centers, all hand tools are held centrally in a tool store, and they are issued from these to trainees on request. This practice is followed both to safeguard the workshop stock against loss (tools seem regularly to be "mislaid" or pilfered) and to ration those tools not available in sufficient numbers to issue them permanently to all students. The problem with this degree of control is that it inevitably cases delays to instruction, as students collect (and sign for) tools and return them after use. There are also problems of non-return, causing further delays as tools are searched for. There is also the point that the practice does not help to create trust between workshop staff or to foster good men-management relations.

A more appropriate practice - and the one almost universally followed in European maritime training centers, is to provide each trainee, on appointment, with his own tool box and personal set of hard tools. The trainee signs for these and assumes full responsibility for them as long as he is in training at the center, not only keeping them safely, but also maintaining them in good condition. Special tools that are only needed occasionally are held in the workshop tool store, and issued on presentation of the appropriate Job Card. An interesting procedure adopted in one Less Developed Country vocational training college is to issue the trainee technicians with a set of individually engraved metal tokens; one of these has to be presented every time a special tool is issued from the store, and is placed in the allocated storage position of the tool in a drawer or on a shelf. There is no confusion over who has that tool, and security is as tight as possible- no token, no tool, and if no tool, the token indicates unmistakably who is holding it. The system is simple, easily

understood and highly recommended for wider use.

Marine engines, just like shore based engines, have changed from steam to diesel. There are enough diesel plants in the marine field to warrant this workshop space allocation to the diesel engine. For a feeling of size and expected values, the diesel engine workshop should have a main engine, two diesel generators and a couple of small diesel engines and various components to depict working principles and settings as a minimum.

The main engine is very likely to be a two-stroke slow speed real size working engine. It should have all the instrumentation, automation and manual controls. Thrust block, transmission shafting with plummer blocks, a tail shaft in sterm tube and a propeller rotating in a sealed tank of water should complete the working design. The "propeller tank"should have transparent windows to view what is going on inside. The tank should be made of re-enforced concrete. The necessary staircaises, platforms, cranes, engine component stands, etc. should be arranged for mock overhaul and practice, whether the engine is a working copy or not. A couple of parts like levers, cylinder heads, pistons and rings, bearings and others should be near-by for ease of reference and inspection.

The auxiliary diesel engine shop should have at least two engines, each coupled to a three phase four hundred and forty (or so) volt alternator set.

In the seamanship workshop gangways, portable pilot and monkey ladders should be provided. Fore and aft lines with rings for hooking safety belts. The rigging of stages and boatswain's chair, working on ship's side by work rafts etc. should all have their various rigs placed

in seamanship workshops.

Rope work is very basic seamanship. The different materials for manufacturing (natural, synthetic and metallic) should have samples and equipment for splicing them; this will mean spikes, fids and cutters to match the rope material and sizes.

With the rope comes the pulley (sheave and tackle) shackle and hooking arrangements. Bottle screws, grips, opened and closed sockets and such like will aid students in having a good introduction to the profession. Sewing palms and needles will be needed in canvas work.

Windlasses, anchor chains, riding chocks, stoppers, dogs, capstans and different types of anchors should be housed in the workshop.

L. - FIRE FIGHTING CENTER

The building facilities should include:

I) OFFICES

Office accommodation should be provided for:

(i) Officer-in-charge
(ii) Station officer (senior instructor)
(iii) Instructors aid
(iv) Typist (clerical staff)

The every day office furniture and fittings would be necessary to each office.

II) LECTURE ROOMS

Two lecture rooms should be provided to cater for the student throughout, each furnished with:

- 24 desks and chairs
- 1 lectern
- 1 demonstration table (approx. 2 m x 5 m)
- 1 16 mm film projector
- 1 35 mm slide projector
- 1 overhead transparency projector
- 1 projector stand
- 1 projector screen

The following visual aids would be of benefit in presenting various lectures:

(i) An assortment of hand extinguishers cut away for demonstration and illustration

(ii) An assortment of fire hoses cut away for clarity

(iii) An international ship-to-shore fire hose connection

(iv) Respiration and resuscitation demonstration aids

(v) Siebe Gorman marine air master positive pressure set for demonstration and illustration use only

(vi) Neil Robertson stretcher and " Para Guard" stretcher for demonstration and illustration only

(vii) An assortment of 16 mm films, 35 mm slides and overhead transparencies relevant to the lecture sessions

III) PRACTICAL WORK EQUIPMENT

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

(i) Air compressor house
(ii) Breathing apparatus air compressor and maintenance program
(iii) Work bench area for the maintenance of 30 B.A. sets
(iv) 30 Siebe Gorman marine air master positive pressure sets complete with spare cylinders (six sets for instructor's use only)
(v) Comprehensive breathing apparatus spare parts program
(vi) Comprehensive breathing apparatus maintenance tool kit aid
(vii) 30 distress signal units for attachment to breathing apparatus sets

IV) MISCELLANEOUS EQUIPMENT

The following equipment would be necessary to implement the full practical training program:

(i) Fire hose (delivery) 10 each of 45 mm and 70 mm diameter
(ii) Fire branches (delivery) 2 standard type "A" branches, 2 diffuser branches, 2 controlled (jet / spray) branches
(iii) 2 Nº 5 mechanical foam branches
(iv) 1 high expansion (hi-ex) foam generator
(v) Sufficient foam compound for mechanical branches and hi-ex generator

(vi)	2	standpipes, keys and bars to operate hydrant supply
(vii)	6	nine liter water type extinguishers
	6	nine liter foam type extinguishers
	6	five kg carbon dioxide type extinguishers
	3	ten kg dry powder type extinguishers
(viii)	4	thirty six meters safety lines and snaphooks
(ix)	1	smoke helmet and bellows
(x)	1	Neil Robertson stretcher
	1	"para guard" stretcher
(xi)	2	first aid kits and spares aid
(xii)	2	Minuteman resuscitation sets

M. - SURVIVAL CENTER

A reasonable fenced-off and tarmac area to give security for storage of boats, and leading to a shipway and jetty. The jetty should have a set of gravity davits mounted as on a ship, with electric winch recovery gear, fitted with a standard fiber glass motor sailing life boat. Within the tarmac area there should be a building with a clear floor area of approximately 200 sq. meters, for the inflation of life rafts, maintenance of boats, etc. Down one wall of this area there should be a fitted bench with six vices fitted for wire splicing and there should be ring bolts in the roof span for rigging tackles for the suspension of a stage or bosun's chair.

In association with the building there should be laboratories and hot/cold washing and shower facilities and a changing and locker room for students on survival courses in particular.

This proposed survival center should be equipped with the following:

(a) Two eight-man inflatable life rafts, with full set of equipment

(b) One 8 m G.R.P. motor / sailing lifeboat, with full set of equipment

(c) Six 4.3 m sailing dinghies suitable types preferably in G.R.P. construction

(d) One inflatable rescue craft with outboard motor for safety boat during survival course instruction

(e) 24 life-jackets

(f) Full set of dummy pyrotechnics for demonstration purposes

(g) Line throwing apparatus (with dummy rockets and cartridges)

(h) Two sets sheer legs with hawser, whip and breeches buoy for rigging in tarmac, shipway area, with three-fold purchase and associated cordage

(i) Selection of single, double and three-fold rope blocks for rigging different forms of tackle

(j) Single and double wire rope blocks for tackles

(k) Two wire rope snatch blocks

(l) Electric capstan for hauling craft up shipway

(m) Set of gravity davits on jetty with associated electric winch for recovery of life boat into stowed position

(n) Instead of (l), a Sampson post and single derrick with an associated electric winch could be installed adjacent to the shipway for instruction in rigging of derricks and the lifting of boats.

N. - EQUIPMENT FOR CERTIFICATE OF PROFICIENCY IN SURVIVAL CRAFT COURSES

1.- Partially enclosed life-boat with oars, steering oar and full equipment
2.- Scales model life-boat with sails
3.- Gravity davits with recovery facility, power and manual
4.- Evacuation slide, inflatable liferaft in classroom
5.- Liferaft equipment
6.- Portable radio equipment for survival craft
7.- Helicopter strop
8.- Range of life-jackets
9.- Fire protected life-boats with full support systems
10.- SOLAS rescue boat
11.- Launching davit for inflatable liferaft or inflatable boat
12.- Survival craft (EPIRB)
13.- Three immersion suits and three thermal protective aids
14.- Neil Robertson stretcher
15.- muster lists, training and survival manuals
16.- on-board maintenance manual

O. - KITCHEN AND RESTAURANT BUILDING

- Classroom beside the kitchen
- Restaurant of one hundred persons capacity
- Restaurant of thirty persons capacity (staff)
- Store (drinks and snacks)

P. - RECREATION CENTER

- Television room
- Bar
- Games room
- Reception room

CHAPTER THREE

EDUCATIONAL CURRICULUM

3.1.- GENERAL INFORMATION

3.1.1. STCW CONVENTION

The STCW Convention establish that all Regulations and Appendices are mandatory on all parties to the Convention and are international in their scope and effect. It was agreed at the 1978 Conference wish adopted the Convention, that would come into force when 25 countries, who collectively represented 50% of the world's shipping had accepted to it. This position was reached in April 1983 with 25 countries and 60% of world tonnage.

3.1.2 EDUCATIONAL GOALS

During the studies at WMU one of the most important parts of the curriculum are the field trips; during these periods of time we are exposed to different education systems in various countries. Even though training ratings is not the main point of attention during these visits, personally I have been compiling information that provide me with a good idea of the basic requirements that has to be met in order to educate and train the multipurpose rating that is demanded by the international shipping industry.

Since the country has at this moment a great amount of

seafarers with different levels of education and the main purpose is to enable the seafarer to continue in the market with confidence, the Training Center has to begin setting the entry requirements as follows:

- Secondary school level (9 years of education) for experienced seafarers
- High school level (11 years of education) for newcomers

In cases where experienced seafarers do not meet this minimum entry requirements, special courses will be conducted for them in separate programs.

Base on this level of education, the Center will aim to prepare the student to work onboard a ship in two areas:

- Multipurpose rating
- Catering rating

3.2.- COURSES

Course 3.2.1 Pre-Sea Cadet (general purpose rating)

PART A: Course Framework

Scope

This course is intended for ratings who have not served onboard a seagoing vessel and covers the mandatory minimum training requirements prescribed by the Regulations II/6 paragraph 2, III/6 paragraph 2, of the International Convention on Standards of Training, Certification and Watchkeeping for seafarers (STCW), 1978; it includes instruction in the use of hand and power tools, shipboard maintenance, bridge familiarization, rope and wire work, derricks and lifting gear, tanker safety, general ship knowledge and practice

at sea.

Objective

Successful completion of this course should enable candidates to serve onboard as a general purpose rating, and to perform specific duties and responsibilities according to the certification.

Entry standards

This course is open to Honduran citizens meeting the following requirements:

- 18 years of age or older
- High school level of education (11 years)
- Meet statutory medical standards

PART B : SYLLABUS OUTLINE

COURSE 3.2.1.

SUBJECTS (MAIN)	CONTENTS		HOURS	
1. SAFETY	1.1	Fire-fighting and protecting	40	
	1.2	Life-boat drill	40	
	1.3	Survival at sea	5	
	1.4	Damage control	4	
	1.5	Tankship safety	12	
	1.6	First Aid	16	
	1.7	Accident Prevention Regulations	15	132
2. CARGO WORK	2.1	Cargo-Characteristics	6	
	2.2	Cargo-Care	6	
	2.3	Cargo-Handling	20	
	2.4	Care, Handling & Carriage of Petroleum Products	8	40
3. MARINE ENGINEERING	3.1	Technology of working materials	24	
	3.2	Working techniques I (metal)	120	
	3.3	Working techniques II (splicing)	46	
	3.4	Engine duties	42	
	3.5	Ship construction & types	18	250

4. SHIPHANDLING	4.1	Watch-Keeping	20	
	4.2	Signaling	6	
	4.3	Rules of the road	14	40
5. ENGLISH	5.1	General	120	
	5.2	Specialized	120	240
6. PRACTICE	6.1	Deck	60	
ONBOARD	6.2	Engine	60	120
	TOTAL		HOURS	822

1. S A F E T Y (132 HOURS)

1.1. FIRE-FIGHTING & PROTECTION (40 HOURS)

1.1.1. Legislation
1.1.2. Theory of combustion
1.1.3. Fire detection
1.1.4. Causes of fire and preventive measures
1.1.5. Fire-fighting equipment (portable)
1.1.6. Large scale fire-fighting installations
1.1.7. Fire-fighting
1.1.8. Fire squad, musters and fire drills
1.1.9 Breathing apparatuses
1.1.10. Fire-fighting on oil-tankers
1.1.11. Gas detection
1.1.12. International Maritime Dangerous Goods Code (IMDG)

1.2. LIFE BOAT DRILL (40 HOURS)

1.2.1. General introduction
1.2.2. Various types of davits
1.2.3. Lifeboats
1.2.4. Equipment of lifeboats
1.2.5. Handling of lifeboats (theoretical)
1.2.6. Drill for launching lifeboats
1.2.7. Lifeboat-work under oars
1.2.8. Lifeboat-work under sail
1.2.9. Life-rafts
1.2.10. Usage of life-rafts
1.2.11. Distress-signals

1.3. SURVIVAL AT SEA (5 HOURS)

1.3.1. General information about physical and psychic conditions
1.3.2. Behavior in lifeboats and life-rafts

1.4. DAMAGE CONTROL (4 HOURS)

1.4.1. Methods of leakage control
1.4.2. Material in use of damage control

1.5. TANKSHIP SAFETY (12 HOURS)

1.5.1. Possible dangers and characteristics of oil cargoes
1.5.2. Hazards
1.5.3. Hazards control
1.5.4. Safety equipment and protection of personnel
1.5.5. Safety regulations and codes of safe practice

1.6. FIRST AID (16 HOURS)

1.6.1. General principles
1.6.2. Structure and functions of the human body
1.6.3. First Aid treatment
1.6.4. Dressings and bandages
1.6.5. Treatment of wounds
1.6.6. Injuries
1.6.7. Moving casualties
1.6.8. Equipment (content of FIRST AID BOX)

1.7. ACCIDENT PREVENTING REGULATIONS (15 HOURS)

1.7.1. General regulations
1.7.2. Precautions in machinery spaces
1.7.3. Precautions above and below deck
1.7.4. Working in holds and tanks
1.7.5. Handling of moving ropes and wires

3. MARINE ENGINEERING (250 HOURS)

3.1. TECHNOLOGY OF WORKING MATERIAL (24 HOURS)

3.1.1. Technological properties of steel
3.1.2. Technological properties of alloys
3.1.3. Technology of selected materials

3.2. WORKING TECHNIQUES I (METAL) (120 HOURS)

3.2.1. Measuring
3.2.2. Marking and scribing
3.2.3. Filing
3.2.4. Chiselling
3.2.5. Sawing
3.2.6. Cutting and shearing
3.2.7. Drilling and countersinking by machine
3.2.8. Sharpening and deburring
3.2.9. Bending
3.2.10. Soldering and brazing
3.2.11. Welding

3.3 WORKING TECHNIQUES II (SPLICING) (46 HOURS)

3.3.1. Construction and characteristics of ropes and material
3.3.2. Preparing ropes and wires for use
3.3.3. Preservation and protection of ropes and wires
3.3.4. Knots, bends and hitches
3.3.5. Belaying all kinds of ropes and wires
3.3.6. Splicing of ropes and wires

3.4. ENGINE DUTIES (42 HOURS)

3.4.1. Theory of diesel engines
3.4.2. Practical maintenance

3.4.3. Indicating instruments

3.4.4. Tools

3.4.5. Operations of engines and auxiliaries

3.4.6. Theory and function of electrical devices

3.4.7. Theory and function of working machines

3.4.8. Pipes and pipefitting

3.5. SHIP CONSTRUCTION AND SHIP TYPES (18 HOURS)

3.5.1. Stresses on ship

3.5.2. Riveted and welded constructions

3.5.3. Components and types of cellular bottoms

3.5.4. Bulkheads, deeptanks, shellplating, stem and stern

3.5.5. Rudders (types)

3.5.6. Construction of different ship types

3.5.7. Reading and handling of ship plans and mechanical drawings

4. S H I P H A N D L I N G (40 HOURS)

4.1. WATCH-KEEPING

4.1.1. Navigational equipment

4.1.2. Meteorological instruments

4.1.3. Ship-handling (manoeuvering)

4.1.4. Anchor and mooring work

4.1.5. Seamarkers

4.2. SIGNALING (6 HOURS)

4.3. RULES OF THE ROAD (14 HOURS)

5. E N G L I S H (240 HOURS)

5.1. GENERAL (120 HOURS)

5.2. SPECIALIZED (120 HOURS)

6. P R A C T I C E O N B O A R D

6.1 DECK (60 HOURS)

6.2 ENGINE (60 HOURS)

TOTAL : 822 HOURS

1.1. FIRE-FIGHTING & PROTECTION (40 HOURS)

1.1.1.	Legislation
1.1.2.	Theory of combustion
1.1.3.	Fire detection
1.1.4.	Causes of fire and preventive measures
1.1.5.	Fire-fighting equipment (portable)
1.1.6.	Large scale firefighting installations
1.1.7.	Fire fighting
1.1.8.	Fire squad, musters and fire drills
1.1.9.	Gas detection
1.1.10.	International Maritime Dangerous Goods Code (IMDG)

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA

1.
 	
1.1
 	
1.1.1
		S A F E T Y
		
		FIRE-FIGHTING & PROTECTION
		
		<u>Legislation</u>
		- National and international legislation for the protection of ships against fire
		
		- Fire-proofing of ships in design and construction:
		  - watertight doors
		  - electrical equipment and installations
		  - fire resisting divisions
		  - emergency escapes
		  - windows and laps
		  - shut-off devices
			- general knowledge of legislation concerning fire-proofing constructional means	- SOLAS
				- SSV
				- UVV
				- national and international legislation

Seafarers Training Center		1. SAFETY (132) 1.1. FIRE-FIGHTING & PROTECTION (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.1.		FIRE-FIGHTING & PROTECTION		
1.1.2.		<u>Theory of combustion</u> - inflammable materials - oxygen, heat, flashpoint - fire point - ignition temperature - speed of combustion - fire classes - spontaneous combustion	- understanding the fundementals of combustion and its relevance for fire fighting	- files - educational tables - slides - chemical tests and demonstrations

1.1.3.		<u>Fire detection</u>
		- fire patrols, watchman, standing orders
		- individual behavior rules
		- fixed detection and alarm systems:
		  - smoke detectors
		  - radio-active smoke detectors
		  - gas detection
		  - flame detection
		  - smoke and heat detection
			- knowledge of action to be taken after detection of fire
			- knowledge of fixed installations for fire detection
			- ability to test and maintain all detection equipment
				- plan lay-out
				- operation manuals
				- technical data sheets

Seafarers Training Center		1. SAFETY (132) 1.1. FIRE-FIGHTING & PROTECTION (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.1		FIRE-FIGHTING & PROTECTION		

1.1.4.		<u>Cause of fire and preventive measures</u>
		
		- fires originating in:
		  - burning and welding
		  - smoking
		  - stoves
		  - electrical installations
		  - engine room
		  - pump room
		  - accommodation
		  - cargo holds
			- knowledge of the most frequent cause for fire and the adequate preventive measures and actions to be taken	- SBG-annual reports
				- case studies
				- film

1.1.5.		<u>Firefighting equipment (portable)</u> - extinguishing agents: water, steam, CO_2 , inertgas, foam, dry powder - fire pumps, fire main emergency pump - international shore connection - fire hoses and nozzles - portable fire extinguishers: foam, water, powder, and CO_2 type	- knowledge of all fire fighting equipment on board, and ability and skill to use it in the most successful way - knowledge of the properties of different extinguishing agents	- hoses, nozzles, hydrants - all types of portable extinguishers - blow-ups - drawings - practical demonstrations and exercises
Seafarers Training Center		1. SAFETY (132) 1.1. FIRE-FIGHTING & PROTECTION (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.1.		FIRE-FIGHTING & PROTECTION		
1.1.6.		<u>Fixed large scale firefighting installations</u> - CO_2 smothering system - low pressure bulk CO_2 system - inert gas system - steam smothering system - high-pressure water spray - foam generating systems - sprinkler systems - drencher systems	- general knowledge of the function and operation of the most common fixed fire fighting system	-operation manuals - technical drawings - models - practical demonstrations - visits on board ships - technical data sheets
1.1.7.		<u>Fire fighting</u> - actions to tackle fires in cargo spaces - accommodation fires - engine-room fires - oil fires - galley fires - electrical fires	- ability to carry out the required tasks during fighting various fires	- films - practical exercises - case studies - reports - plans
Seafarers Training Center		1. SAFETY (132) 1.1. FIRE-FIGHTING & PROTECTION (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.1.		FIRE-FIGHTING & PROTECTION		
1.1.8.		<u>Fire squad, musters and fire drill</u> - fire fighting-tasks in the muster-list, individual duties - fire drills - composition of fire-squad - fireman's outfit - alarm signals	- knowledge of assigned duties - according to the muster list, the alarm signals and the composition of fire squad and fireman's outfit	- legislation - muster lists - safety plans - fire drills - fireman's outfit according to legislation (e.g. heat protective suit)
1.1.9.		<u>Breathing apparatuses</u> - approved types of breathing apparatuses - smoke helmets - compressed air-unit - maintenance, components and testing of compressed air units and face-masks - air charging equipment - spare parts - fundamentals of respiration - search and rescue of crew-members - firefighting and working with compressed air units	- knowledge of different types of breathing apparatuses, its components and functions - ability to test and use compressed air unit in different situations - ability to maintain, store and charge compressed air units	- all types of breathing apparatuses - manuals - practical exercises - visual aids - technical data sheets
Seafarers Training Center		1. SAFETY (132) 1.1. FIRE-FIGHTING & PROTECTION (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.1.		FIRE-FIGHTING & PROTECTION		
1.1.10.		<u>Fire-fighting on oil-tankers</u> - maintenance of fire-fighting equipment - fire fighting technique on tankers - fire drills - fixed fire-fighting installations on board tankers - emergency closing appliances - fire protection in port	- knowledge of specific fire fighting requirements on board of tankers - ability to carry out required fire protection and fire-fighting tasks on board of tankers	- standing orders - tankship safety - manuals - films - safety guides
1.1.11.		<u>Gas detection</u> - portable gas detectors - hazards of enclosed spaces - oxygen analyzers, explosiometers	- knowledge of the hazards of enclosed spaces - ability to operate different types of gas detectors	- different types of gas detectors - manuals - practical experience - films
Seafarers Training Center		1. SAFETY (132) 1.1. FIRE-FIGHTING & PROTECTION (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.1. 1.1.12.		FIRE-FIGHTING & PROTECTION <u>International Maritime Dangerous Goods Code (IMDG)</u> - precautions and fire-fighting measures during loading and discharging of IMDG-goods - precautions and fire-fighting during voyage carrying dangerous goods on board - IMDG goods deck stowage - IMDG goods separation	- knowledge of IMDG-labels - knowledge of precautions with IMDG-goods	- IMDG-code - IMDG-labels - films - stowage plan
Seafarers Training Center		1. SAFETY (132) 1.1. FIRE-FIGHTING & PROTECTION (40)		Multipurpose Rating

1.2. LIFE BOAT DRILL (40 HOURS)

1.2.1. General introduction
1.2.2. Various types of davits
1.2.3. Lifeboats
1.2.4. Equipment of lifeboats
1.2.5. Handling of lifeboats (theoretical)
1.2.6. Drill for launching lifeboats
1.2.7. Lifeboat-work under oars
1.2.8. Lifeboats-work under sail
1.2.9. Life-rafts
1.2.10. Usage of life-rafts
1.2.11. Ancillary life-saving equipment
1.2.12. Distress-signals

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.2.		LIFE BOAT DRILL		
1.2.1.		General introduction - muster list - emergency stations - duties of the stand-by boat crew as well as for all crew-members	- knowledge of contents of muster list and emergency signals	- specimen of muster list - SOLAS - SSV - UVV
1.2.2.		Various types of davits - gravity davit - luffing davit - quadrant davit - radial davit - single arm davit for liferafts	- general knowledge of the different types of davits in construction and operation	- educational tables - foils - descriptions
1.2.3.		Lifeboats - construction - material - capacity - markings etc.	- knowledge of construction and material of lifeboats - knowledge of color and markings	- description of manufacturer
Seafarers Training Center		1. SAFETY (132) 1.2. LIFE BOAT DRILL (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.2		LIFE BOAT DRILL		
1.2.4.		Equipment of lifeboats		
			- skills of using the lifeboat equipment	- specimen of equipment of lifeboats
1.2.5.		Handling of lifeboats (theoretically)		
		- pulling orders - man overboard - sea anchor - manoeuver with engine	- knowledge of pulling orders - manoeuver under oars - manoeuver with engine - man-overboard manoeuver - handling sea anchor - skill to launch and recover lifeboats with various davits	- foils - film
1.2.6.		Drill for launching lifeboats		
		- with davits available	- skill to launch and recover lifeboats with various davits	
Seafarers Training Center		1. SAFETY (132) 1.2. LIFE BOAT DRILL (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.2.		LIFE BOAT DRILL		
1.2.7.		<u>Lifeboat-work under oars</u> - manning a boat - pulling orders, pulling a boat - manoeuvering a boat - "man-overboard" manoeuver - getting under way, getting alongside - usage of sea anchor	- skill to command life-boats in all conditions and circumstances	- original life-boats - educational films
1.2.8.		<u>Lifeboat-work under sail</u>	- skill to handle life-boats under sail	- sails and sailing equipment
1.2.9.		<u>Life-rafts</u> - inflatable, rigid life-rafts - inflatable boats, equipment	- knowledge about construction and function of different life-rafts - skill to use the equipment	- description of manufacturers - educational films
Seafarers Training Center		1. SAFETY (132) 1.2. LIFE BOAT DRILL (40)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.2.		LIFE BOAT DRILL		
1.2.10.		<u>Usage of life-rafts</u> - exercise with life-rafts on the water	- skill to launch life-rafts - embark life-rafts	- original life-raft
1.2.11.		<u>Ancillary life-saving equipment</u> - lifejackets, lifebuoys - manoeuverboard-lights - air rescue belt - line throwing apparatus - breeches buoy	- knowledge of function of the ancillary equipment - skill to use the ancillary equipment	- specimen, models - original ancillary equipment - educational tables
1.2.12.		<u>Distress-signals</u> - rescue signal table - distress signals - pyrotechnics - emergency radio/portable transm. - EPIRB	- thorough knowledge of international distress-signals - skill to use pyrotechnics - knowledge of function and usage of Emergency Radio and "EPIR"	- specimen, models - tables - original pyrotechnics - description of manufacturers
Seafarers Training Center		1. SAFETY (132) 1.2. LIFE BOAT DRILL (40)		Multipurpose Rating

1.3. SURVIVAL AT SEA (5 HOURS)

1.3.1. General information about physical and psychic conditions

1.3.2. Behavior in lifeboats and liferafts

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.3.		SURVIVAL AT SEA		
1.3.1.		General information about physical and psychic conditions - preparation before abandon ship - behavior in the water	- knowledge about the dangers of the sea, disaster, shock, reaction - abandon ship procedure	- educational films - annual reports
1.3.2.		Behavior in life-boats and liferafts - behavior during rescue - first aid in survival environments	- how to survive in the water and in a life-boat, life-raft - food and water rationing	
Seafarers Training Center		1. SAFETY (132) 1.3. SURVIVAL AT SEA (5)		Multipurpose Rating

1.4. DAMAGE CONTROL (4 HOURS)

1.4.1. Methods of leakage control

1.4.2. Material in use of damage control

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.4		DAMAGE CONTROL		
1.4.1.		<u>Methods of leakage control</u> - risks for crew and ship in case of flooding - flooding situation - first measures in case of damage	- knowledge of dangers and risks for crew and ship in case of flooding	- educational films
1.4.2.		<u>Material in case of damage control</u> - damage control and repair equipment - material and emergency construction against flooding - possibilities of plugging a leak	- knowledge of different possibilities of plugging a leak	- material and tools
Seafarers Training Center		1. SAFETY (132) 1.3. SURVIVAL AT SEA (5)		Multipurpose Rating

1.5.	**TANKSHIP SAFETY (12 HOURS)**
1.5.1.	Possible dangers and characteristics of oil cargoes
1.5.2.	Hazards
1.5.3.	Hazards control
1.5.4.	Safety equipment and protection of personnel
1.5.5.	Safety regulations and codes of safe practice

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.5. 1.5.1.		TANKSHIP SAFETY <u>Possible dangers and characteristics of oil cargoes</u> - vapor pressure/temperature - influence of pressure on boiling temperature - saturated vapor pressure - flammability limit - explosive limits - petroleum vapor - vapor travel - flashpoint and auto-ignition temperature - static electricity	- basic knowledge of possible dangers to human life and to the environment from accidents including the handling of oil in bulk - knowledge of physical properties of oil carried	- operation and equipment manuals - films - visual aids - safety guide for oil tankers (ICS/06/MF)
Seafarers Training Center		1. SAFETY (132) 1.5. TANKSHIP SAFETY (12)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.5.		TANKSHIP SAFETY		
1.5.2.		Hazards		
		- explosion and flammability hazards - health hazards - hazards to the environment - corrosive hazards	- basic knowledge of hazards resulting of the carriage of oil in bulk	- operation and equipment manuals - films - visual aids - safety guide for oil tankers (ICS/06/MF)
1.5.3.		Hazard control		
		- inerting, monitoring techniques - anti-static measures - ventilation, segregation, compatibility of materials	- skill to operate hazard control systems	
1.5.4.		Safety equipment and protection of personnel		
		- gas measuring equipment - specialized fire extinguishing appliances - breathing apparatuses - protective clothing	- knowledge of the function and operation of safety equipment	
Seafarers Training Center		1. SAFETY (132) 1.5. TANKSHIP SAFETY (12)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA

1.5.
 	
1.5.5.
		TANKSHIP SAFETY
		
		<u>Safety regulations and codes of safe practice</u>
		
		- ship's emergency plans
		- ship obsigns and equipment of oil tankers:
		  - piping, pumping, tank and deck arrangements
		  - types of cargo pumps
		  - tank cleaning, gas freeing and inerting systems
		  - cargo tank venting
		  - ganging systems and alarms
		  - cargo heating systems
		  - safety factor of electrical systems
		- repair and maintenance
		- ship operation
			- familiarization with safety regulations and codes of safe practice for ship's operations repair and maintenance and ship design	- operation and equipment manuals
				- films
				- visual aids
				- safety guide for oil tankers (ICS/06/MF)

Seafarers Training Center		1. SAFETY (132) 1.5. TANKSHIP SAFETY (12)		Multipurpose Rating

1.6. FIRST AID (16 HOURS)

1.6.1. General principles
1.6.2. Structure and functions of the human body
1.6.3. First Aid treatment
1.6.4. Dressings and bandages
1.6.5. Treatment of wounds
1.6.6. Injuries
1.6.7. Moving casualties
1.6.8. Equipment (content of FIRST AID BOX)

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.6.		FIRST AID		
1.6.1.		<u>General principles</u> - aims of first aid - scope of first aid - rules of first aid	- general knowledge of aims, scopes and rules of first aid	- according to instructions of St. John Ambulance Association - according to international "Red Cross" program
1.6.2.		<u>Structures and functions of the human body</u> - structure - muscles - circulating system - respiratory system - function of the brain	- general knowledge of structure and function of the human body	
1.6.3.		<u>First Aid treatment</u> - resuscitation - relieving shock - artificial respiration - external cardiac massage - controlling bleeding	- knowledge of first aid treatment - skill to carry out artificial respiration and external cardiac massage - skills to control bleedings	
Seafarers Training Center		1. SAFETY (132) 1.6. FIRST AID (16)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.6.		FIRST AID		
1.6.4.		Dressings and bandages		
			- skill to apply dressings and bandages	- all kinds of First Aid equipment
1.6.5.		Treatment of wounds		
		- disinfection and cleansing of wounds	- skill to treat all kinds of wounds	
1.6.6.		Injuries		
		- burns and scalds - poisoning - electric shock - eye injuries - fractures - drowning - injuries to muscles	- knowledge of most important injuries - skill to give casualties first aid treatment in case of drowning, electric shock, fractures, fractures, poisoning, burns and scalds eye injuries, injuries to muscles	
Seafarers Training Center		1. SAFETY (132) 1.6. FIRST AID (16)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.6.		FIRST AID		
1.6.7.		<u>Moving casualties</u> - examination prior to moving a casualty - carrying a casualty	- skill to handle and carry casualties	- transport equipment
1.6.8.		<u>Equipment</u> - contents of a first aid box	- knowledge of the necessary equipment of first aid boxes	- first aid box
Seafarers Training Center		1. SAFETY (132) 1.6. FIRST AID (16)		Multipurpose Rating

1.7. ACCIDENT PREVENTING REGULATIONS (15 HOURS)

1.7.1. General regulations
1.7.2. Precautions in machinery spaces
1.7.3. Precautions above and below deck
1.7.4. Working in holds and tanks
1.7.5. Handling of moving ropes and wires

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.7.		ACCIDENT PREVENTING REGULATIONS		
1.7.1.		General regulations		
		- basic duties of employers and employees	- thorough knowledge of all relevant safety regulations covering all aspects of work and behavior on board	- national and international safety regulations - case studies
1.7.2.		Precautions in machinery spaces		
		- overhauling machinery - overhauling lifting gear - machine engines - boilers - generators, pumps, compressors etc. - refrigeration plat	- knowledge of consequences for careless handling - ability to observe faults and to take the right measures to prevent accidents	- films - practical demonstrations - check lists
Seafarers Training Center		1. SAFETY (132) 1.7. ACCIDENT PREVENTING REGULATIONS (15)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.7. 1.7.3.		ACCIDENT PREVENTING REGULATIONS <u>Precautions above and below deck</u> - cargo-handling appliances - fire protection regulations - anchors, chains cables, ropes - handtools - manual handling - portable ladders - accommodation ladders and gangways - safety barness and lines - rope ladders - staging - bosun's chair - hatchways	- ability to observe faults and to take the right measures to prevent accidents	- national and international safety regulations - case studies - films - practical demonstrations - check lists
Seafarers Training Center		1. SAFETY (132) 1.7. ACCIDENT PREVENTING REGULATIONS (15)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
1.7.		ACCIDENT PREVENTING REGULATIONS		
1.7.4.		Working in holds and tanks	- ability to observe faults and to take the right measures to prevent accidents	- national and international safety regulations - case studies - films - practical demonstrations - check lists
1.7.5.		Handling moving ropes and wires - wire rope slings and splices - fibre rope slings - maintenance and use of slings - hook accidents - causes of chain failure - entry into enclosed spaces - protective clothing - life-saving appliances - regulations for insured persons - duties of safety wardens	- ability to observe faults and to take the right measures to prevent accidents	
Seafarers Training Center		1. SAFETY (132) 1.7. ACCIDENT PREVENTING REGULATION (15)		Multipurpose Rating

2.1. CARGO-CHARACTERISTICS (6 HOURS)

2.1.1. Classification of cargoes

2.1.2. Cargo characteristics

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2. 2.1. 2.1.1.		C A R G O W O R K S CARGO-CHARACTERISTICS <u>Classification of cargoes</u> - general cargo - break bulk cargo - unit loads - solid bulk - liquid bulk - ship types for specialized trades - general loading and discharging techniques	- description of the different classes of cargo - general knowledge of specialized trades and handling techniques	- handbooks - statistics - tables - visual aids
Seafarers Training Center		2. CARGO WORKS 2.1. CARGO-CHARACTERISTICS	(40) (6)	Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.1. 2.1.2.		CARGO-CHARACTERISTICS <u>Characteristics of cargoes</u> - stowage factors - broken stowage - stowage requirements - deadweight cargo - measurement cargo - viscosity of cargo - density of cargo - angle of repose - measurement of cargo - markings of cargo - packing of cargoes - separation of cargo	- knowledge of different qualities and quantities of cargo - cargo marking and packing of cargo	- stowage plans - ship plans
Seafarers Training Center		2. CARGO WORKS (40) 2.1. CARGO-CHARACTERISTICS (6)		Multipurpose Rating

2.2. CARGO-CARE (6 HOURS)

2.2.1. Securing and lashing methods (break bulk)

2.2.2. Securing and lashing systems (unit loads)

2.2.3. Treatment of cargo during voyage

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.2.		CARGO-CARE		
2.2.1.		<u>Securing and lashing methods (break bulk)</u> - dunnaging - lashing methods general cargo - lashing and securing materials - lashing heavy lifts	- description of common methods for lashing and securing of general cargo and unitized cargo	- handbooks - manuals - visual aids - practical demonstrations and exercises
2.2.2.		<u>Securing and lashing systems (unit loads)</u> - permanent fitted container-locating equipment - removable location equipment - container stocking and tier fittings - container top-tier fittings - lashing terminals - container lashings - securing systems for trailers	- knowledge of container terminals - ability to use	- container terminals: - twist locks - adapter - hornfittings (bullhorns) etc.
Seafarers Training Center		2. CARGO WORKS (40) 2.2. CARGO CARE (6)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.2. 2.2.3.		CARGO-CARE <u>Treatment of cargo during voyage</u> - ventilation and sweat - prevention of temperature - evolution of gases - sweat, types of sweat - condensation factors - temperature and dew point - rules of hold ventilation	- knowledge of treatment of delicate cargo during passage, ventilation systems and precautions against sweat damage	- literature
Seafarers Training Center		2. CARGO WORKS (40) 2.2. CARGO CARE (6)		Multipurpose Rating

2.3. CARGO HANDLING

2.3.1. Preparation of cargo spaces (holds)
2.3.2. Types of cargo gear
2.3.3. Inspection, testing and maintenance of lifting machinery
2.3.4. Use and application of cargo handling gear
2.3.5. Basic principles of loading and discharging
2.3.6. Cargo access equipment (Lo-Lo)
2.3.7. Cargo access equipment (Ro-Ro)

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.3.		CARGO HANDLING		
2.3.1.		<u>Preparation of cargo spaces (holds)</u> - break bulk cargo - unit loads - bulk cargo - refrigerated cargo - oil cargo - tallying and separation	- knowledge of preparing cargo spaces for different types of cargo	- study visit on board ship

2.3.2.		<u>Types of cargo gear</u>
		
		- rigging and operation of:
		  - swinging derricks
		  - union purchase derricks
		  - twin derricks
		  - heavy-lift derricks
		  - "Stuelcken" derrick
		  - special purpose derricks
		  - deck crane
			- knowledge of rigging and components of different cargo gear
			- skill to operate winches and cargo gear
				- models
				- foils
				- practical exercises
				- study visits
				- visual aid
				- technical data sheets

Seafarers Training Center		2. CARGO WORKS (40) 2.3. CARGO HANDLING (20)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.3.		CARGO HANDLING		
2.3.3.		<u>Inspection, testing and maintenance of lifting machinery</u> - tests before taken into operation - periodic inspections - maintenance on board - rope and wire specifications - blocks and shackles specifications - markings, SWL, etc. - stresses on cargo gear	- general knowledge of legislation concerning inspection and maintenance of lifting machinery - knowledge of markings and stamps	- "Lloyd" regulations - ILO-regulations
2.3.4.		<u>Use and application of cargo handling gear</u> - slings, chains, shackles, special purpose slings, spreaders, hooks, grabs, clamps, pallet gear - SWL, stresses on cargo handling gear	- description of the different cargo handling gear and its methods of application	- visual aids - samples of different slings and gear
Seafarers Training Center		2. CARGO WORKS 2.3 CARGO HANDLING		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.3.		CARGO HANDLING		

2.3.5.		<u>Basic principles of loading and discharging</u>
		
		- stowage principles
		- stowage of different cargoes
		- ship-shore handling methods
		- handling of:
		  - break-bulk cargo
		  - unitized cargo
		  - bulk cargo
		- safe working procedures
		- typical cargo damages
			- knowledge of basic principles of loading and charging methods for different types of cargo	- stowage plan
				- literature

2.3.6.		<u>Cargo access equipment (Lo-Lo)</u>
		
		- components and methods of operation of :
		  - single pull hatch covers
		  - hydraulic folding hatch covers
		  - rolling hatch covers
		  - tweendeck flush sliding hatch covers
		  - direct pull hatch covers
		  - Mc Gregor types
			- knowledge of operation and components of the most common access equipment for Lo-Lo handling	- foils
				- data sheets of manufacturers
				- operation manuals

Seafarers Training Center		2. CARGO WORKS 2.3. CARGO HANDLING		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.3. 2.3.7.		CARGO HANDLING <u>Cargo access equipment (Ro-Ro)</u> - components and methods of operation of: - side doors - bow ramps - axial stern ramps - quarter and slewing ramps - hoistable platforms - internal ramps - bulkhead doors - car decks	- basic knowledge of operation and components of the most common access equipment for Ro-Ro handling	- literature
Seafarers Training Center		2. CARGO WORKS 2.3 CARGO HANDLING		Multipurpose Rating

2.4. CARE, HANDLING AND CARRIAGE OF PETROLEUM PRODUCTS (8 HOURS)

2.4.1. General principles

2.4.2. General operations and cargoes

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
2.4.		CARE, HANDLING AND CARRIAGE OF PETROLEUM PRODUCTS		
2.4.1.		<u>General principles</u> - tanker compartments - pipe-line lay-out - oil- and oil products - bulkoil carrier - terms used in oil transportation	- knowledge of general and terminology principles concerning the transportation of petroleum products	- handbooks - tanker manuals - standing company orders
2.4.2.		<u>General operations and cargoes</u> - general operations in port - pollution prevention - bulk cargo, ballast, tank-cleaning and inert gas system - operations and safety - bulk cargo system-maintenance - operations and maintenance - deck		
Seafarers Training Center		2. CARGO WORKS (40) 2.4. CARE, HANDLING AND CARRIAGE OF PETROLEUM PRODUCTS (8)		Multipurpose Rating

3.1. TECHNOLOGY OF WORKING MATERIAL
(24 HOURS)

3.1.1. Technological properties of steel

3.1.2. Technological properties of alloys

3.1.3. Technological properties of selected materials

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.		M A R I N E E N G I N E E R I N G		
3.1.		TECHNOLOGY OF WORKING MATERIALS		
3.1.1.		<u>Technological properties of steel</u> - tensile strength - tensile stress - compressive strength - bending strength - shear strength - torsional strength - tenacity - yield point - finess ration - dependence of tensile strength and breaking elongation from C-proportion - dependence of hardness, forming property, toughness and weldability from C-proportions	- knowledge of technological properties of steel in marine engineering	- tension test with universal testing machine - strain and extension diagram - Brinell machine - Fe-C-diagram - tables
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.1. TECHNOLOGY OF WORKING MATERIALS (24)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.1.		TECHNOLOGY OF WORKING MATERIALS		
3.1.2.		<u>Technological properties of alloys</u>		
		- copper - strength - forming property - heat conductivity - electrical conductivity - property and usability of copper in the ship-technique	- knowledge of technological properties of alloys and its usability in marine engineering	- tension test with copper -cold forming test - cold working - heat conductivity test - red brass armatures - bronze bearing - breaking samples - samples of material
		- aluminum - range of application resulting out of its technological, physical and chemical properties	- knowledge of range of application of aluminum and its alloys	
		- heavy metal		
		- usage of plumbum, zinc, tin in the shiptechnique	- insight in the usage of plumbum, zinc, tin in marine engineering	- samples of material
		- corrosion of alloys	- knowledge of electrolytic corrosion, pittings, intercrystalline corrosion	- various metal sheets - voltameter - electro-chemical series
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.1. TECHNOLOGY OF WORKING MATERIALS (24)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.1. 3.1.3.		TECHNOLOGY OF WORKING MATERIALS <u>Technological properties of selected materials</u> - properties of plastomere, elastomere, duromere - reinforced plastic - polyvinylchloride - resistance to U.V. radiation - breaking strength - resistance to aging - melting point - polypropylene - polyethylene	- general knowledge of the main properties of synthetic materials and its utilization	- samples of various synthetic materials
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.1. TECHNOLOGY OF WORKING MATERIALS (24)		Multipurpose Rating

3.2. WORKING TECHNIQUES I (METAL)
(120 HOURS)

3.2.1. Measuring
3.2.2. Marking and scribing
3.2.3. Filing
3.2.4. Chiselling
3.2.5. Sawing
3.2.6. Cutting and shearing
3.2.7. Drilling and countersinking by machine
3.2.8. Sharpening and deburring
3.2.9. Bending
3.2.10. Soldering and brazing
3.2.11. Welding

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2. 3.2.1.		WORKING TECHNIQUES I (METAL) <u>Measuring</u> - length measurements (external dimensions) - inside dimensions - parallelism - depth of drilled holes - core diameter - grooves and recesses - methods of measuring - safety of tools	- describing the measuring tools - measuring of lengths and angles with an accuracy of 1/10 mm and 1° - testing of measurements, shapes and plans	- inside callipers - outside callipers - steel rule - tape measures - vernier calliper - depth gauge - micrometer - radius gauge - calliper limit gauge - block gauge
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2. 3.2.2.		WORKING TECHNIQUES I (METAL) <u>Marking and scribing</u> - drawings, reference plans - drilling center - outlines - profiles - line of cut - elastic curves - working limits and centers - design with colors - letters and numbers	- skill to transfer drawing measurements to workpiece - marking out with scriper - center punching - description of marking and scribing tools and aids - their function and usage - description of designation methods - designation of workpieces	- deep drawing-sheet - surface table - steelrule - steel needle - brass needle - 90° back square - center punch marking plate - surface gauge - workpieces - designation material and stamps - dividers
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2. 3.2.3.		WORKING TECHNIQUES I (METAL) <u>Filing</u> - round filing - flat filing - parallel filing	- describing of the different fields, their function and usage - clamping of work pieces - filing of workpieces to given measurements and required flatness	- plain vice - protective pads - steel square - back square - file brush - flat hand file - square file - triangular file - round file - halfround file - different shaped workpieces and sheets of different materials
Seafarers Training Center		3. MARINE ENGINEERING 3.2. WORKING TECHNIQUES I (METAL)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2. 3.2.4.		WORKING TECHNIQUES I (METAL) <u>Chiselling</u> - dividing chiselling - shearing chiselling - clip removing chiselling of large surfaces - safe work techniques	- competence of: - clamping the workpiece - holding and guiding the chisel - preparatory chiselling - chiselling through - shearing chiselling of thin sheets - hammer blows - describing the different chisels, their function and usage	- rounded-off flat chisel - shearing chisel - cape chisel - protective shield - 500 g machinist hammer - steel-support plate - metal sheets - workpieces
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA

3.2.
 	
3.2.5.
		WORKING TECHNIQUES I (METAL)
		
		<u>Sawing</u>
		
		- sawing of metal sheets, profiles and pipes
		- safe work techniques
			- skill to:
			  - clamp the workpiece on edge (vertical) and flat (horizontal)
			  - fix the saw blade
			  - start to saw
			  - guide the hacksaw
			  - saw at the end of the cut
			  - de-burr with the file
			- describing different saws
			- saw blades
			- saw teeth angles
			- pitches: their function and usage
				- hand hacksaw
				- marking tools
				- filing tools
				- workpieces

Seafarers Training Center		3. MARINE ENGINEERING 3.2. WORKING TECHNIQUES I (METAL)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2. 3.2.6.		WORKING TECHNIQUES I (METAL) <u>Cutting and shearing</u> - shearing metal sheets with hand plate shears and universal plate shears - shearing metal sheets and profiles with alligator shear - safe shearing process - re-align thin sheets with hammer blows	- skills to mark an arc, of which the center point lies outside the workpiece - shear straight cuts, internal and external round shearing - description of different shears, their function and usage	- handplate shears - universal plate shears - holing plate shears - alligator shears - metal sheets - profiles - work pieces - marking tools
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2. 3.2.7.		WORKING TECHNIQUES I (METAL) <u>Drilling and countersinking by machine</u> - preparing the drilling machine - chucking the drill - fitting the drill into center punch hole - spot drilling - rough drilling (drilling a smaller hole first) - counter-sinking with rose-bit - de-burring with rose-bit - drilling through holes - safe working techniques and protective clothing - drilling blind holes	- basic skills to: - drill holes to a required depth and diameter by means of drilling machine - countersink with rose-bits - description of drilling machine, its components, drill, rose-bits, their function and usage - description of the use and function of cutting lubricants	- marking tools - drill center punch - clamping equipment - twist drills (4.5, 6.4, 6.8, 7, 10) - rose-bits (90°, (120°)
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2.		WORKING TECHNIQUES I (METAL)		
3.2.8.		<u>Sharpening and reburring</u> - sharpening of tools and workpieces	- description of grinding and sharpening equipment and machines, materials, their function and usage - skill of clamping the tools - safe usage of grinding machine - skill to sharp and grind tools and workpieces to given measurements	- tools - grinding machine and equipment - measurement tools
3.2.9.		<u>Bending</u> - bending simple shapes in the vice - bending at right angles - bending with bending blocks and jaws	- skills to: - mark the bending points from the middle onwards - bend over the bending block - bend simple workpieces to given dimensions with observation of changes in the material	- marking tools - wooden mallet - bending block - bending jaw - pattern chisel
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA

3.2.
 	
3.2.10.
		WORKING TECHNIQUES I (METAL)
		
		<u>Soldering and brazing</u>
		
		- soldering and brazing a simple connection
		- preliminary work
		- cleaning of connections
			- skill to:
			  - solder according to given specifications
			  - braze according to given specifications
			- description of heat sources, solders and aids, their function and usage
				- soldering bit
				- soldering iron
				- soldering hammer
				- tools for cleaning
				- soldering fat
				- solder
				- soft solder

Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.2. 3.2.11.		WORKING TECHNIQUES I (METAL) <u>Welding</u> - to cut and weld workpieces	- description of preliminary work - description of welding equipment, its function and usage - operation of welding equipment - skill to carry out simple welding jobs	- autogenous welding equipment - arc welding equipment - gas cutting equipment - welding rods - protective clothing - protective shield - workpiece - current regulator
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.2. WORKING TECHNIQUES I (METAL) (120)		Multipurpose Rating

3.3. WORKING TECHNIQUES II (SPLICING) (46 HOURS)

3.3.1.	Construction and characteristics of ropes and material
3.3.2.	Preparing ropes and wires for use
3.3.3.	Preservation and protection of ropes and wires
3.3.4.	Knots, bends and hitches
3.3.5.	Belaying all kinds of ropes and wires
3.3.6.	Splicing of ropes and wires

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.3.		WORKING TECHNIQUES II (SPLICING)		
3.3.1.		Construction and characteristics of ropes and materials - natural fiber ropes - synthetic ropes - miscellaneous cordage - wire ropes - types of ropes - strength of ropes and wires	- knowledge of material and construction of ropes and wires	- various cordage, ropes and wires - formulas and scales
3.3.2.		Preparing ropes and wires for use - coiling - uncoiling - handling of ropes	- skill to handle ropes and wires	
3.3.3.		Preservation and protection of ropes and wires - stowage - worming, parcelling and serving	- skill to stow and serve ropes and wires	- canvas - cordage - serving mallet - marking spike - fid - splice bar, splicer
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.3. WORKING TECHNIQUES II (SPLICING) (46)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.3.		WORKING TECHNIQUES II (SPLICING)		
3.3.4.		<u>Knots, bends and hitches</u>		
		- Reef knot, figure-of-eight knot, bowline, running bowline, bowline on the bight, round turn and two half hitches, half hitches, clove hitch, timber hitch, marlinespike hitch, double blackwall hitch, blackwall hitch, slip hitch, sheet bend, double sheet bend, double carrick bend, long and short sheepshank, crown knot, wall knot, stage hitch, midshipman's hitch, attaching safety line, catspaw, stopper knot, heaving line knot	- knowledge of common knots and their utilization on board - knowledge of knots, bends and hitches - skill to use appropriate knots and bends for all kind of purposes on board	- ropes - wires - tackles - bits - tools - bosun's chair - anchor ball - stages
3.3.5.		<u>Belaying all kinds of ropes and wires</u>	- skill to belay ropes and wires on various bollards, to cleats and steghorns	- ropes - wires - twin bollards - cleats - steghorns
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.3. WORKING TECHNIQUES II (SLICING) (46)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.3. 3.3.6.		WORKING TECHNIQUES II (SPLICING) <u>Splicing of ropes and wires</u> - splicing natural and synthetic fiber ropes - common whipping - sailsmaker's whipping - eye splice - splicing thimbles - short splice - back splice - splicing of a square line (eye splice) - splicing wire ropes (wire splice as specified in the DIN standard eye splice DIN= Deutsche Industrie Norm)	- knowledge of rope and wire splicing and practical capability - knowledge of practical utilization	- ropes - wires, splicing tools - samples of different splices
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.3. WORKING TECHNIQUES II (SPLICING) (46)		Multipurpose Rating

3.4. ENGINE DUTIES (42 HOURS)

3.4.1.	Theory of diesel engines
3.4.2.	Practical maintenance
3.4.3.	Indicating instruments
3.4.4.	Tools
3.4.5.	Operations of engines and auxiliaries
3.4.6.	Theory and function of electrical devices
3.4.7.	Theory and function of working engines
3.4.8.	Pipes and pipefitting

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.4.		ENGINE DUTIES		
3.4.1.		<u>Theory of diesel engines</u>		
		- the working phases of 2 and 4 stroke engines, methods of cooling lubrication - fuel-air mixtures, compression ignition exhaust-system - fuel injectors, valves, pumps and general arrangements	- basic knowledge of 2-stroke and 4-stroke diesel-engines, coolingsystem, lubricating-system, greasing-system - insight into the general construction and effect of main engine and auxiliaries	- literature concerning diesel engines - operating instructions - maintenance instructions - operation manual - service bulletin - educational tables and films - exhibition model - care and maintenance regulations - engine layout
3.4.2.		<u>Practical maintenance</u>		
		- stripping and overhauling main engine and auxiliaries - cleaning - greasing - lubrication - checking - recognizing signs of wear and tear	- thorough knowledge of practical maintenance - basic knowledge in tending and maintaining the engine, its appliances and the most important parts - basic skill in assisting simple works in the engine room to maintain, and repair	
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.4. ENGINE DUTIES (42)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.4.		ENGINE DUTIES		
3.4.3.		<u>Indicating instruments</u>		
		- meters and gauges - operating data	- thorough knowledge of function of indicating instruments, meters and gauges and operating data - ability in reading and handling the instruments	- models - tables - manometer - thermometer - revolution indicator - powermeter - vibrationmeter - voltameter - amperemeter
3.4.4.		<u>Tools</u>		
		- competent choice of necessary tools, their usage and specialties	- basic knowledge of usual tools on board used for maintenance and repair - skill in handling the tools	- various hammers, screwdrivers, spanners, slippers, drills, wrenches - tool sets - miscellaneous motor tools
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.4. ENGINE DUTIES (46)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.4. 3.4.5.		ENGINE DUTIES <u>Operation of engines and auxiliaries</u> - put into operation - put out of operation - attendance, control - supervision of operation	- ability to put into and to put out of operation - skill to attend the operation - recognize of breakdown - ability to simple trouble shooting	- motor model (1:1)
Seafarers Training Center		3. MARINE ENGINEERING 3.4. ENGINE DUTIES	(250) (46)	Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.4. 3.4.6.		ENGINE DUTIES <u>Theory and function of electrical devices</u> - ship power-supply - emergency power supply - alternators, generators - electrical motors - electrical conductors - phases, voltage, power, switches, fuses, plugs, bulbs, batteries and electrical tools - relating safety regulations - tending, maintenance, repairs and trouble shooting - operation of electrical engines	- basic knowledge of theory of electricity - insight in function of electrical motors - ability in finding simple electrical faults - basic knowledge in tending and maintaining electrical motors - skill to carry out simple repairs - ability to put into and to put out of operation - skill to attend the operation	- models - samples - operation manual - switch diagram - operating instructions - index lists - educational tables
Seafarers Training Center		3. MARINE ENGINEERING 3.4. ENGINE DUTIES	(250) (42)	Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.4.		ENGINE DUTIES		
3.4.7.		<u>Theory and function of working engines</u> - purifiers - compressors - pumps - separators - refrigerating machines - evaporators - pressure tanks - operation and check points of working engines	- basic knowledge of working engines - insight into general construction and effect of working engines - ability to handle working engines - basic knowledge in tending and maintaining working engines	- models - operation manuals - operating instructions
3.4.8.		<u>Pipes and pipefitting</u> - connection of pipes - pipe sizes - threads and thread cutting devices - packings - valves and their function - use of synthetic piping - ship's piping and pumping system	- knowledge to enable repair/ renew leakage or corroded piping - skill to carry out pipe connection - knowledge of ship's piping and pumping system - bilge and tank system	- pipe lay-out - pipe bench-vice - pipe wrench - joints for pipes - T-pipes - couplings - sleeves - angles - armatures -models, patterns
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.4. ENGINE DUTIES (46)		Multipurpose Rating

3.5. SHIP CONSTRUCTION AND SHIP TYPES
(18 HOURS)

3.5.1.	Stresses on ship
3.5.2.	Riveted and welded connections
3.5.3.	Components and types of cellular bottoms
3.5.4.	Bulkheads, deeptanks, shellplating stem and stern
3.5.5.	Rudders (types)
3.5.6.	Construction of different ship types
3.5.7.	Basic principles of ship stability
3.5.8.	Reading and handling of ship plans and mechanical drawings

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.5.		SHIP CONSTRUCTION AND SHIP TYPES		
3.5.1.		<u>Stresses on a ship</u> - longitudinal stresses - transverse stresses - collapsing stresses - local stresses	- basic knowledge of ship's components, parts constructional methods - knowledge of specific ship parts and ship types	- ship plans technical drawings - dockyard visits - models - films - handbooks
3.5.2.		<u>Rivetted and welded connections</u> - rivets and rivet holes - spacing and pitch - welding - type of welded connections		
3.5.3.		<u>Components and types of cellular bottoms</u> - transverse framing - longitudinal framing - components		
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.5. SHIP CONSTRUCTION AND SHIP TYPES (18)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.5.		SHIP CONSTRUCTION AND SHIP TYPES		
3.5.4.		<u>Bulkheads, deeptanks, shell-plating, stem and stern</u> - transverse bulkheads - collision bulkhead - deep tanks - shell plating pillars - stem and stern	- basic knowledge of ship's components, parts, construction methods - knowledge of specific ship parts and ship types	- ship plans - technical drawings - dockyard visits - models - films - handbooks
3.5.5.		<u>Rudders (types)</u> - stern frame - rudder blades - rudder carrier and rudder gland - stern tube		
3.5.6.		<u>Construction of different ship types</u> - oil tanker - dry-cargo vessel - container vessel - bulk carrier - RO/RO ships		
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.5. SHIP CONSTRUCTION AND SHIP TYPES (18)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
3.5.		SHIP CONSTRUCTION AND SHIP TYPES		
3.5.7.		<u>Basic principles of ship stability</u> - center of gravity - center of buoyancy - distribution of weights - hydrostatics - buoyancy - trim - cargo distribution	- basic knowledge of ship's components, parts, constructional methods - knowledge of specific ship parts and ship types	- ship plans technical drawings - dockyard visits - models - films - handbooks
3.5.8.		<u>Reading and handling of ship plans and mechanical drawings</u> - delineation and reading of simple technical drawings and plans - different elevation - drafting - protractions - skeleton sketches	- basic skills to delineate and read simple technical and mechanical drawings and plans	- ship plan - foils - literature
Seafarers Training Center		3. MARINE ENGINEERING (250) 3.5. SHIP CONSTRUCTION AND SHIP TYPES (18)		Multipurpose Rating

4.1. WATCH-KEEPING (20 HOURS)

4.1.1. Navigational equipment
4.1.2. Meteorological instruments
4.1.3. Ship-handling (manoeuvering)
4.1.4. Anchor and mooring work
4.1.5. Seamarkers

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
4.		S H I P H A N D L I N G		
4.1.		WATCH-KEEPING		
4.1.1.		<u>Navigational equipment</u> - compass (magnetic or gyro) - steering the ship - steering, orders and commands - soundings - log (speed-control) - revolutionindicators - rudder indicator - INTERCOM - chronometer - telegraph	- ability to read off the indicating instruments for course, speed, soundings and time - ability to handle the different instruments	- handbooks - manuals - compasses - different types of navigational instruments
Seafarers Training Center		4. SHIPHANDLING (40) 4.1. WATCH-KEEPING (20)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
4.1. 4.1.2.		WATCH-KEEPING <u>Meteorological instruments</u> - barometer - hygrometer - facsimile reproduction equipment - anemometer - tide tables - thermometer	- ability to ascertain meteorological data - skill to operate meteorological instruments - description of weather observations - ability to read off the different indicating instruments for weather observing - various dimensions (Celsius, Fahrenheit, Reaumur)	- meteorological instruments - tide tables - weather charts - handbooks - practical observations
Seafarers Training Center		4. SHIPHANDLING (40) 4.1. WATCH-KEEPING (20)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
4.1. 4.1.3.		WATCH-KEEPING <u>Ship-handling (manoeuvering)</u> - effects influencing the steering qualities of a ship - general principles - type of machinery - propellers (axial and transverse thrust) - loading condition - rudder types - ship types - wake current - screw race - stopping distance - turning cycles - wind effect - shallow water effect	- description of controllable and uncontrollable effects on the steering qualities of a ship	- handbook - slides - films
Seafarers Training Center		4. SHIPHANDLING (40) 4.1. WATCH-KEEPING (20)		Multipurpose Rating

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
4.1.		WATCH-KEEPING		
4.1.4.		<u>Anchor and mooring work</u>		
		- anchor cables - anchor types - windlass - anchor work - berthing - berthing and mooring work - commandoes for anchor and mooring work - mooring lines	- skill to operate anchor and mooring gear and lines - description of anchor and mooring manoeuvres, gears and mooring lines - knowledge of commandoes	- handbooks - visual aids
4.1.5.		<u>Seamarkers</u>		
		- uniform system of bouyage - lateral marks - cardinal marks - isolated danger marks - safe water marks - special marks	- description and identification of maritime buoyage, typical forms, colors of markers for wrecks, estuaries and navigational dangers - lateral and cardinal buoyage system	- sea charts - foils - slides
Seafarers Training Center		4. SHIPHANDLING (40) 4.1. WATCH-KEEPING (20)		Multipurpose Rating

4.2. SIGNALING (6 HOURS)

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
4.2.		SIGNALING - international code of signals - code flags - single letter hoists - single letter signals - morse signalling - procedure signals and signs - signalling by sound (whistle, siren, typhon) - pilot signals - gale warning signals	- skill to hoist flags - description of rules for dipping flags - knowledge of the most important signals and signal choices - knowledge of selected letters in morse code	- signal flags - morse lamp - VHT - foghorn - international signal book
Seafarers Training Center		4. SHIPHANDLING (40) 4.2. SIGNALING (6)		Multipurpose Rating

4.3. RULES OF THE ROAD (14 HOURS)

REF.NO.	HOURS	SUBJECT	LEARNING OBJECTIVES	MEDIA
4.3.		RULES OF THE ROAD - application - general definitions - steering and sailing rules - conduct of vessels in sight of one another - vessels in restricted visibility - lights and shapes - sound and light signals - technical details of lights and shapes - technical details of sound - signal appliance - selected signals of various ships	- naming and description of optical and acoustical signals of vessels and other objects - description of the most important steering and sailing rules for power-driven-vessels - ship under manoeuver - engine powered ship - sailing ship - fishing boats - pilot (day-night-and fog signals)	- legislation - international regulations for preventing collisions at sea
Seafarers Training Center		4. SHIPHANDLING 4.3. RULES OF THE ROAD	(40) (14)	Multipurpose Rating

6. PRACTICE ON BOARD (120 HOURS)

6.1. DECK

6.2. ENGINE

PRACTICE ON BOARD (120 HOURS)

OBJECTIVE

The purpose of the seatraining is:

- to gain experience with all relevant aspects of seatraining mentioned on board the vessels the trainee is employed on
- applying knowledge acquired at school in the daily practice on board
- sustaining and extending knowledge practice - wise
- preparing for future function on board

The importance of the seatraining phase is two-fold: on the one hand the seatraining is an indispensable part of the tuition process, on the other hand it presents opportunity to accumulate the required seatime and to carry out the assignments needed to be granted the certificates of competency.

AIM AND ARRANGEMENT OF THE SEATRAINING MANUAL

The aim of the seatraining manual is twofold, viz.:

- guidance of the trainee by presenting him with a kind of program leading to achieving the objectives of the seatraining phase
- guidance of the trainee's instructors in allowing them to monitor the course of the seatraining phase and to check, judge and adjust when necessary

MONITORING

It is of utmost importance for the trainee to experience the shipboard organization as a unilateral system, to which experience the monitoring must attribute. Therefore the trainee is guided:

- on board by one monitor
- at school by one lecturer

DURATION OF SEATRAINING PHASE

The duration of the seatraining period is fixed at 25 days, exclusive of the seatraining accumulated on the training vessel " FNH YOJOA".

TO THE SHIP'S MANAGEMENT

The seatraining must bear an integrated character effected by alternative periods of duty on deck, the bridge and in the engineroom. Preferably periods of one week duration max. should be upted for. This new feature of integration will certainly ask for adaptations in the over-all shipboard management structure and should have the layout support of all involved.

So we kindly ask for your cooperation in making adequate arrangements regarding the shipboard organization, the monitor's duties and the possibilities for the trainee to master his skill.

TO THE MONITOR

Proper guidance is a prerequisite for ultimate success with a trainee's shipboard achievements. To this end a monitor will be assigned to him whose task will be:

- to see to it that the trainee will carry out his assignments with proper regularity
- to support where necessary the trainee's personal initiative
- to supervise the proper execution of the various tasks

It is of vital importance that the trainee's job assignments be evenly distributed among deck, bridge and engineroom activities reserving equal time for each discipline.

This training manual contains various subjects to be dealt with by the trainee, of which the following aspects are of interest:

- technical data
- the assignments to be carried out
- the operation skills

The list of required technical data is after completion to be signed by the monitor as "seen".

A secondary objective in the sampling of data is to speed up the process of the trainee's getting "shipwise". Therefore the data sampling should take place in the initial stage of the seatraining phase. In the case of absence of certain data or items on board the word " irrelevant" is to be inserted.

It is recommendable before starting an assignment to first discuss it with the trainee so that pertinent information be available to him. When in the course of its execution the assignment proves to be unfeasible, e.g. as a result of effect of sailing area or type of vessel in consultation with the trainee a substitute

assignment will be decided upon. In order to achieve the necessary operational skills the trainee should as much as possible be employed in the various activities mentioned. The monitor should satisfy himself that the trainee has not only accomplished a task set, but has also mastered the job and acquired the specific operational skill. The item is then marked off in the manual. Every job done is to be marked off by the person supervising it, a total of all the jobs performed to be listed weekly for survey.

ADVICE TO THE TRAINEE REGARDING THE SEATRAINING MANUAL

1.- The assignments listed in the manual are in close relationship with the official Sailing Competencies to be obtained after completing the training course successfully.

2.- In the seatraining phase three areas of interest are focused on viz.:
- the progress of becoming shipwise
- the extension of knowledge and skills through the execution of the various assignments
- achieving operational skills

a.- **Becoming Shipwise**
Gather the data as specified in the manual and complete the lists on the pertinent pages. Data or subjects not present on board are listed as " irrelevant".

b.- **Carrying Out Assignments**
Each chapter contains an assignment to make a report. The reports matters of practical

nature experienced or executed by yourself must be emphasized.

If assignments cannot be executed on account of sailing area, vessel type, stress of weather, etc., you should give timely notice and report on the substitute assignment you have decided on in consultation with your monitor.

c.- Operational Skills

When in your monitor's discretion, an operational skill has been achieved, you will have it marked off in your manual. The skill will then be marked down as achieved on the collective list.

3.- Weekly Overviews

It is of vital importance that the monitoring lecturer keep in close touch with the course of your seatraining phase. Therefore activities done during the week should be succinctly noted down on the weekly overview with some rough indication of the hours spent. Each activity should be affirmed by signature by the person under whose authority the job was done.

4.- After signing off you should personally deliver the reports, weekly overviews etc. at the school academic division.

CHAPTER 1 - PERSONAL DATA

NAME: _

DATE OF BIRTH: _

ADDRESS AND POSTAL CODE: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

_ _

PHONE NUMBER: _

NUMBER DISCHARGE BOOK: _

TRAINING CENTER: _

CHAPTER II - DATA SAILING TIME / DATA VESSEL

a. GENERAL INFORMATION

Name: Call sign: Owners: Name Master: Name Chief Engineer: Name Monitor: Date of signing on: Date of signing off: Accumulated sailing time:

b. DIMENSIONS, DEADWEIGHT AND PROPULSION CAPACITY

Length between perpendiculars: Length over all: Beam: Depth of main deck: Draught summer: Freeboard summer: Net tonnage: Gross tonnage: Displacement summer draught: Deadweight capacity summer draught: Service speed knots: Capacity propulsion plant: Type of propulsion:

c. VESSEL TYPE

General cargo, bulk carrier, Ro-Ro, container, Tanker, tug, etc.:	
	Signed as seen by monitor _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (Signature) (Date)

CHAPTER III - NAVIGATION

a.- Technical data

A. NAVIGATIONAL EQUIPMENT	
Magnetic Compass	- type
Gyrocompass	- make - type - linked to
Log(s)	- make - type - working principles
Echosounder(s)	- make - type - way of registration
Radar(s)	- make - type - wave length
ARPA's	- make - type
Decca Navigator	- type - way of reading off
Loran C	- make - type

technical data continued

Direction Finder	- make - type - way of reading and sense determination
Satellite Navigator	- make - type - way of reading off
Autopilot	- make - type
Turn Indicator	- make - type
Docking Log	- make - type - way of reading off
Load Indicator	- make - type
Levelmaster	- make - type

technical data continued

B. COMMUNICATION EQUIPMENT BRIDGE AND RADIOROOM	
VHF	- make - type - number of channels
Navtex	- make - type
Facsimile	- make - type
Satellite Communication	- type - make - operating frequency
MF/HF transmitters/receivers	- number - type - frequency range

Remarks	Seen monitor: (Signature) (Date)

b.- Assignment

Make a report on the duties or responsibilities of a navigational bridge watch.
The report must contain:

a.- Duties carried out by the officer encharged of the watch; the navigator; the quartermaster; th hellsman; the lookouts etc.

b.- Procedure used to follow the routeplanning

c.- Details of the voyage execution such as:
- methods of position finding used
- details of the navigational systems and instruments employed
- the data used from pertinent sources as book of reference, charts, current atlases, tide tables, etc.

Number of pages assignment: _ _ _ _ _	Seen monitor: _ _ _ _ _ _ _ _ _ _ _ _ (Signature) (Date)

c.- Operational skills

1.- Can collect charts and similar matter in preparation of an intended passage.
2.- Can practice chartwork during passage.
3.- Can determine compass error.
4.- Can reduce courses.
5.- Has determined position by means of electronic aids to navigation.
6.- Can keep the meteorological and current journals
7.- Can operate means of internal and external communication.
8.- Has knowledge of the collision rules.
9.- Can make preparations for anchoring and weighing anchor. (As a part of a team)
10.- Can stand bridge watch. (As a part of a team)
11.- Can stand anchor watch. (As a part of a team)
12.- Can stand watch while at berth. (As a part of a team)

Remarks:	Seen monitor: (Signature) (Date)

CHAPTER IV - DECK MACHINERY

a.- Technical data

Anchorwindlass, anchors, cables
- type
- drive
- weight anchors

Towing winches
- type
- drive
- maximum tractive power
- safeguard

Capstan and warping winches
- types
- number of each
- drive
- safeguard

Main steering gear
- type
- number of rams or wings
- number of pumps
- type of pumps
- capacity
- drive
- maximum working pressure
- type of remote control system
- number of rudders
- maximum rudder deflection
- time lapse between turning rudder from 30 degrees on one side to 30 degrees on opposite side at max. servicespeed

technical data continued

Deck cranes
- type
- number
- drive
- max. lifting capacity
- safeguard

Cargo winches
- type
- number
- drive
- max. lifting capacity
- safeguard

Hydraulic pumps for deckmachinery
- type
- number
- number of cylinders
- power consumption

Remarks:	Seen monitor: (Signature) (Date)

b.- Assignment

Describe arrangements and operation of steering engine with the aid of a diagram. Also emergency provisions and their activation.
Number of pages assignment:_ _ _ _ _
Seen monitor: _ _ _ _ _ _ _ _ _ _ _ _ (Signature) (Date)

CHAPTER IV - DECK MACHINERY

c.- Operational skills

1.- Has performed helmsman duties and can steer the vessel.

2.- Has participated with the bridge team during anchoring, mooring and unmooring manoeuvers.

3.- Has been in action on fore- or aftship during anchoring, mooring and unmooring manoeuvres.

4.- Knows the arrangement, the working and the operation of the deck machinery.

Remarks:	Seen monitor: (Signature) (Date)

CHAPTER V - PROPULSION PLANT

a.- Technical data

Main engine
- make and type
- built-up
- power
- number of cylinders
- reversible or non-reversible
- two or four stroke cycle
- scavenging system
- trunk piston or crosshead construction
- direct or indirect injection
- number of inlet and exhaust valves
- maximum or minimum speed (r.p.m.)
- kind of fuel
- final compression pressure
- maximum combustion pressure
- specific fuel consumption
- starting procedure

Coupling / reduction
- type of coupling (sheet / hydraulic, reversible, etc.)
- type of reduction
- reduction ratio
- kind of teeth
- operation coupling

Thrust bearing
- type
- independent or built-in

Shafting
- parts
- speed (r.p.m.)
- type of stern tube sealing
- type and number of bearings

Propeller
- make
- fixed / adjustable pitch
- number of blades
- size of pitch (left/right)

Bow thruster
- type of drive
- max. power absorbed

Remarks:	Seen monitor: _____ _____ (Signature) (Date)

b.- Assignment

Describe the action for maintaining the main engine(s) in proper condition during the voyage. In this respect pay attention to:

- pressures arising in cylinders
- output per cylinder
- exhaust gas temperatures, both per cylinder an before and after the turbo chargers
- quality of cooling and lubrication
- fuel injection conditions

Number of pages assignment:_ _ _ _ _	Seen monitor: _ _ _ _ _ _ _ _ _ _ _ _ (Signature) (Date)

CHAPTER V - PROPULSION PLANT

c.- Operational skills

1.- Can prepare the propulsion plant for departure 2.- Can switch the propulsion plant to arbor duty after receiving the order " finished with engines". 3.- Has shown ability to manoeuver main engine by means of hand operation and to take the required preparatory action. 4.- Has shown ability to start the diesel generators and/or turbo- generators, to switch on to the system, to supervise the proper operation and to stop them. 5.- Has shown ability to supervise engine plant during sea duty. 6.- Can accumulate data to keep the engine room log, the oil journal, the O-man duty check-list and any other relevant journals.

Remarks:	Seen monitor: _____ _____ (Signature) (Date)

CHAPTER VI - AUXILIARY SYSTEMS

a.- Technical data

A. GENERATOR DRIVE

<u>diesel engine</u>
- make and type
- number
- capacity
- speed (r.p.m.)
- two or four stroke cycle
- type of scavenging and supercharging
- kind of fuel
- starting procedure
- final compression pressure
- max. combustion pressure
- specific fuel consumption

<u>turbine</u>
- make
- type
- number of stages
- speed (r.p.m.)
- capacity
- steam pressure entrance
- kind of steam
- steam pressure exit

<u>emergency diesel</u>
- make
- two- or four stroke cycle
- capacity
- starting procedure
- speed (r.p.m.)

technical data continued

B. FUEL SYSTEM

fuel trimming pumps
- number
- type
- capacity
- procedure for starting
- speed (r.p.m.)

fuel transfer pumps
- number
- type
- capacity

fuels
- kinds present

tanks
- capacity tankertank(s)
- capacity settling tank(s)
- capacity daily supply tank(s)
- capacity sludge tank(s)

fuel separators
- number of purifiers
- types of purifiers
- capacity purifiers
- number of clarifiers
- type of clarifiers
- capacity clarifiers

velocity control
- type

technical data continued

fuel blending system
- type
- capacity

C. LUBRICATING OIL SYSTEMS

main lubricating oil pumps
- number
- type
- capacity

lub oil separators
- number
- type

D. DRINKING WATER SYSTEM

fresh water distilling plant
- type
- number
- capacity
- heating medium

E. COOLING AND REFRIGERATION PLANT FOR CARGO AND VICTUALS

Cargo: cooling and refrigerated holds
- number
- volume per hold
- way of cooling

compressors
- number and type
- absorbed power
- coolant
- cooling capacity
- capacity control

technical data continued

Victuals: cooled cells
- number
- temperature
- way of refrigeration

refrigerated cells
- number
- temperature
- way of refrigerating

compressors
- number
- type
- absorbed power
- cooling medium
- cooling capacity

F. STARTING, MANOEUVERING AND PROCESS AIRSYSTEMS

starting air compressors
- number
- capacity
- working pressure
- kind of cooling

manoeuvering air compressors
- number
- capacity
- working pressure
- kind of cooling

process air compressors
- number
- capacity

technical data continued

G. AUXILIARY BOILERS

oil fired steamboilers
- number
- type
- working pressure
- capacity

waste heat steam boilers
- number
- type
- working pressure
- capacity
- way of control

waste heat thermal oil boilers
- number
- type
- capacity
- way of control

oilfired thermal oil boilers
- number
- type
- working pressure
- capacity

Remarks:	Seen monitor: (Signature) (Date)

b. Assignment

Give with the aid of a diagram a description of the arrangement, the working and the operation of an oil fired steamboiler. The following items must be dealt with:

a.- the circuit of the working medium

b.- preliminary action for starting the plant

c.- service monitoring as well as boiler control

d.- the automotive and closing down arrangement

e.- plant safeguards

f.- checking and treating the feed and boilerwater

Number of pages assignment: _ _ _ _	Seen monitor: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (Signature) (Date)

c. Operational skills

1. Knows the arrangement and use of the fuel bunkering, trimming and consumption systems for the main and auxiliary equipment.
2. Knows the procedure for bunkering fuel and oil an the required precautionary measures.
3. Knows the procedure for cleaning lube oil filters and separators.
4. Knows the procedure for starting, performance monitoring of and stopping the distilling plant.
5. Knows the arrangement and the operation, as well as the starting, the performance control and the stopping of the auxiliary boiler with attendant systems.
6. Can analyze and treat fresh cooling water with means available.
7. Can analyze and treat boiler and feed water with means available.
8. Knows the preliminaries for starting the bow thruster.
9. Knows the arrangement and use of the bilge system.
10. Knows the procedure for starting, operating and stopping the cooling and refrigerating plants and a.c. systems.

Remarks:	Seen monitor: (Signature) (Date)

CHAPTER VII - ELECTRIC PLANT

a. Technical data

<u>generators</u>
- type
- number
- voltage
- frequency
- apparent power
- way of cooling

<u>shaft generators</u>
- type
- number
- voltage
- frequency
- apparent power
- way of drive
- max. and min. tolerable speed (r.p.m.) of driving motor
- way of line frequency control

<u>emergency generator</u>
- type
- apparent power
- way of drive

<u>converters and rectifiers</u>
- types
- number
- input and output voltage
- input and output amperage
- input and output power

technical data continued

transformers
- types
- number
- purpose
- input and output voltage and amperage

batteries
- type
- number
- voltage

Remarks:	Seen monitor: (Signature) (Date)

b. Assignment

The electric power supply takes place via the main switch board. The main switch board is fed by the generators, while the electric energy is distributed over the ship in the board.

1.- Describe on the basis of the wiring diagram how two generators are connected to the main system. Indicate their parallel operation.

2.- Describe the parallel operation of a diesel generator. Indicate for 1. or 2. how the generators are safe guarded and how the load is mutually distributed.

When two generators are working in parallel and the output exceeds the max. power of one single generator, how can a block-out be prevented?

When the main generators fail the power supply is partially taken over by the emergency generator or a storage battery via the emergency switchboard.

Describe: (a) the procedure of starting the emergency generator, or

(b) the procedure of starting the storage battery.

What equipment and apparatuses are connected to the main and to the emergency switch board, and why? Indicate how overloading of the emergency switch board can be prevented so as to avoid overloading the emergency generator.

assignment continued

Indicate the safeguards in the emergency switchboard and their purpose.

Is there a switch connection between main and emergency boards?

Describe the procedure of testing the emergency plant.

Describe the procedure of re-starting the electric power supply after the occurrence of a black-out.

Number of pages assignment: _ _ _ _	Seen monitor: _ _ _ _ _ _ _ _ _ _ _ _ (Signature) (Date)

c.- Operational skills

1. Has proved to be able to start, operate and stop a generator.

2. Has proved to be able to switch generators in parallel and to distribute the wattage.

3. Has proved to be able to check and maintain the storage battery.

4. Has proved to be able to start and test the emergency generator.

Remarks:	Seen monitor: (Signature) (Date)

CHAPTER VIII - CARGO HANDLING

a. Technical data

cargo pumps
- number
- type
- capacity
- max. working pressure
- way of drive
- way and place of operation

ballast pumps
- number
- type
- capacity
- max. working pressure
- way of drive
- way and place of operation

stripping pumps
- number
- type
- capacity
- max. working pressure
- way of drive
- way and place of operation

inert gas plant
- inert
- capacity

tankwashing plant
- type
- capacity
- cleaning medium

Remarks:	Seen monitor: (Signature) (Date)

b.- Assignment

Write an account of cargohandling during part of a voyage containing a part of loading, a stretch of voyage and a part of discharge.

The following subjects should be dealt with:

- preparing the ship for the transport
- the use of cargohandling equipment
- cargo supervision during voyage
- preparing the cargo for discharge and the procedure of discharging
- measures for the safety of crew, vessel, cargo and environment.

Number of pages assignment: _ _ _ _	Seen monitor: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (Signature) (Date)

c. Operational skills

1. Has practical knowledge of rigging and handling the tackle.
2. Has practical knowledge of preparing holds, cooling cells and tanks for loading and discharging of inspecting containers of taking the required precautions.
3. Can decide on the proper way of hooking on and knows the arrangement, the operations and the use of the proper equipment.
4. Knows the arrangement of the cargo-pump room, the operation and purpose of the safeguards and alarm of the cargo-pump plant, the operation and contro of the inert gas plant.
5. Has proved to be able to work safely; knows the tank entry procedures; can handle explotionmeter, gas detector and oxygen meter.
6. Can take hold gaugings and temperatures; is familiar with the ventilating system.
7. Knows the cargohandling during the voyage and the relevant safety measures.

Remarks:	Seen monitor: (Signature) (Date)

a. Technical data

A.- FIREFIGHTING PLANT

firepumps
- number
- type
- capacity
- pressure
- location
- location of control and automatic start, if any

emergency firepump
- type
- capacity
- way of drive
- location
- location of control

built-in firefighting system
- type
- connected spaces
- location of control

sprinkler system
- type
- connected spaces
- location of control

fire detecting system
- type of detectors
- connected spaces

fire-cocks
- number

international ship connections
- number
- location

B. BILGE SYSTEM

bilge ejectors
- number
- capacity
- location

bilge pumps
- number
- capacity
- type
- location
- location of control

C. LIFESAVING EQUIPMENT

lifeboats
- number and type

inflatable rafts
- make
- number
- number of persons

man overboard boat
- type
- number of persons

technical data continued

davits and boat cranes
- number
- type

lifebuoys
- number
- type

life belts
- number
- type

D. POLLUTION PREVENTION

sewage system
- type
- capacity

bilgewater separator
- type
- capacity
- control system
- ppm of effluent

incinerator plant
- type
- capacity
- waste to be treated
- required fuel
- max. process temperature

Remarks:	Seen monitor: _____ _____ (Signature) (Date)

b. Assignment

Assignment as to repairs and maintenance cannot be set in advance, they must be executed in consultation with the monitor. If partaking in repair or maintenance, an account must be written containing the following:

1. reason for repair or maintenance
2. preparatory action
3. the action of repair
4. condition of the item after opening
5. required measurements and their outcome
6. reassembling the part or the item
7. preparing for service and trials
8. final conclusion of possible cause and effects; question of responsibility
9. theorizing on results found

Number of pages assignment: _ _ _ _	Seen monitor: _ (Signature) (Date)

c. Operational skills

1. Has participated in firefighting exercises and firedrills and can operate fire-extinguishing means and systems.
2. Can take proper action in case of fire in engine room.
3. Can take proper action in case of fire in accommodation and cargo holds.
4. Has participated in testing the fire detecting an fighting system in holds, accommodation, engine-room and other spaces.
5. Knows the escape routes from engineroom, control-room and steering engineroom.
6. Has participated in boat drill and in lowering an hauling lifeboats and rafts.
7. Has assisted in rendering first aid.
8. Can apply respiration equipment.
9. Knows the treatment of bilgewater and slops.
10. Knows the operational aspects of the sewage plant
11. Has assisted in survey, maintenance and repair.
12. Knows the procedures for checking ropes and wires when used for mooring and towing.

Remarks:	Seen monitor: (Signature) (Date)

COURSE 3.2.2. : PRE -SEA CADET (CATERING RATING)

PART A: COURSE FRAMEWORK

Scope

This course is intended for ratings who have not served on board a seagoing vessel and covers the mandatory minimum training requirements prescribed by the Regulations: II/6 paragraph 2; III/6 paragraph 2, of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978; the instruction covers in addition to the basic safety training (as in course 3.2.1.), Basic cookery, Food Service and Housekeeping.

Objective

Successful completion of this course should enable candidates to work onboard in either the Main Galley or as a steward; and to perform specific duties and responsibilities in accordance to the certification.

Entry standards

This course is open to Honduran citizens meeting the following requirements:

- 18 years of age or older
- high school level of education (11 years)
- meet statutory medical standards

COURSE 3.2.2.

PART B : COURSE OUTLINE

SUBJECTS (MAIN)	CONTENTS		HOURS	
1. SAFETY	1.1	Fire-fighting and protecting	40	
	1.2	Life-boat drill	40	
	1.3	Survival at sea	5	
	1.4	Damage control	4	
	1.5	Tankship safety	12	
	1.6	First aid	16	
	1.7	Accident Prevention Regulations	15	132
2. CATERING	2.1	Introduction to catering, safety and hygiene	16	
	2.2	Food and beverage service	128	
	2.3	Basic cookery, including bakery	72	
	2.4	General housekeeping	16	232
3. ENGLISH	3.1	General	120	
	3.2	Specialized	120	240
4. PRACTICE ONBOARD	4.1	Kitchen	80	
	4.2	Restaurant and general housekeeping	40	120
	TOTAL		HOURS	724

2. PRE-SEA CATERING TRAINING COURSE

2.1 Introduction to Catering, Safety and Hygiene (16 hrs)

- Types of Shipboard Catering Service
- Catering Department structure and functions
- Typical layout and utilization of Galley, store-rooms, pantry, restaurant, accommodation etc.
- Code of Safe Working Practices
- Personal hygiene and appearance
- Cleanliness
- Introduction to food hygiene
- Accommodation Services and cleaning materials

2.2 Food and Beverage Service (128 hrs)

- Common hazards, safe working practices
- Personal hygiene, health and cleanliness
- Personal appearance and uniform/ working gear
- Food hygiene relating to:
    - handling during storage and preparation in service areas & during service
    - cleanliness of service equipment used
    - cleanliness of food service areas
        - ventilation
        - drainage
    - separation of foods, cross contamination
    - disposal of waste foods
    - pest and insect infestation & control
    - use of detergents, disinfectants
    - cleaning materials, machinery
    - preservation of food, canning
        - refrigeration
        - methods of freezing
        - chilling
        - vacuum packing

- Washing up techniques and systems
- Food hygiene law

- Food service social skills:
  - Customer relationships and awareness
  - receiving, greeting, seating etc.
  - presentation of menu etc.
  - dealing with complaints
- The Menu, table d'hote, à la carte
  - Menu compilation and interpretation
  - simple cookery terms
  - recognition of foods and relevant accompaniments
- Types of Food Service
- Types of Beverage Service
- Preparation & Servicing of Restaurant/ Saloon
  - Table laying and preparation
  - placing of cutlery, glassware and plates
  - loading, carrying and unloading trays
  - placing and clearing plates, cutlery etc.
  - offering and placing, serving accompaniments
- Serving
  - Use of fork and spoon, ladle etc.
  - Serving from dishes, salvers etc.
  - Serving cheese etc.
  - Serving beverages and wine
- Use of hot press and plates and ancillary equipment
- Preparing bread, toast and condiments
- The use of the waiter's cloth
- Cleaning during and after service

2.3 Basic Cookery, inc Bread making and Bakery (72 hrs)

- Safe working Practices and potential hazards in the Cookery environment
- Safe use of equipment, general rules

- Hygiene in Cookery and food handling as itemized under food and beverage service
- Food poisoning and prevention
- Hygienic use of equipment
- Identification of foodstuffs
- Understanding of nutrition
- Basic working methods:
    - Boiling, poaching, stewing
    - shallow and deep frying
- The principles of and practice at pastry making and bread making

2.4. General housekeeping (16 hrs)

- Code of Safe Working practices
- Cleaning and maintenance of accommodation, public rooms and bathrooms and fittings
- Proper use and hazards of cleaning equipment
- Proper use and hazards of cleaning materials
- Bed and bunk making, linen changes etc.

CHAPTER FOUR

RECOMMENDATIONS AND CONCLUSION

1.- Successful accomplishment of this project requires an immediate attention. I mean by this the organization of an internal committee who will have among other responsibilities the following:

A. Meet and consult all the parties concerned in the education of the seafarers.
B. Prepare a working plan of short range.
C. Review and improve the present project.
D. Lobby the proper governmental and non-governmental people for financial aid.
E. Be the backbone of the Administration and Operation of the new institution.

2.- The working relationship between the Administration and the central government must be improved, regulatory and administrative procedures streamlined.

3.- Given the economic importance of the seafarers workforce to the national economy and the amount of foreign exchange they can - and do- earn, they should be allowed a better education.

4.- Flexibility must be introduced to speed up educational planning and decision making.

5.- The plan should take the form of a revolving five-

year plan, outlining future equipment and financial needs, and a detailed annual plan with reliable estimates of investment.

6.- Approval of the equipment plan and the sanctioning of equipment investment should be the responsibility of the head of the Administration, following simple procedures and time tables (prepared by the committee) to avoid delays in implementing the plan, and purchasing the equipment.

7.- Central government involvement in equipment, planning, approval of investment, and the procurement process should be kept to the minimum.

8.- The planning committee must have available to them a comprehensive and reliable information system, providing them with all the data they need for their calculations if an appropriate and reliable equipment plan is to be prepared.

9.- The planners must have reliable traffic forecasts and related market intelligence reports, for use in estimating the amount of work to be performed by equipment, and information on current operating and maintenance costs.

10.- Procedures must be established for inspection and review of operating and maintenance records of all units nearing the end of their working/ economic lives.

11.- The principle of accountability must be embodied within the organizational structure, establishing

clear lines of authority and making each member fully aware of his responsibilities and accountable to his immediate superior for his performance.

12.- Manning levels in the laboratories and workshops must be set at realistic levels, based on work-study techniques and designed to provide a clear, efficient and well- supervised instruction.

13.- A clearly thought-out and appropriate recruitment procedure needs to be introduced for each category of technical staff, relying more on aptitude and technical tests than on formal interviewing techniques at the time of selection.

14.- For posts above the basic level, the recommended recruitment method is to plan for succession, developing and training junior staff to take over higher as they become vacant.

15.- Detailed job descriptions should be written for each post and issued to new staff on appointment, care being taken to ensure that all recruits clearly understand what is expected of them.

16.- The Manpower Development Plan must include clear, realistic career structures for all streams, within the institution with promotional potential built-in to every post, and with the most promising staff able to transfer from one category or stream to another as reward for particular effort and as a way of retaining the services of the ablest staff.

17.- A policy of promotion-through-training must be introduced in the Center, supported by regular staff appraisal and the provision of a wide range of internal and external training programs.

18.- The salaries and wages, and the terms and conditions of employment, of all Center staff must be more than sufficient to provide a reasonable quality of life, and must be competitive with those offered for the qualifications and experience by industries nearby.

19.- Motivational devices must be adopted to encourage every staff member to increase performance and efficiency, to suggest and apply improvements in strategies and practices, to be constantly cost-conscious, and to be committed to the Center's objectives.

20.- Every division head must be given full responsibility for running his division,sub-division or unit and each individual allowed to perform his tasks to the best of his ability, with full support and encouragement from above.

21.- Immediately after joining the Center, all new members should be given company and job induction training, prepared and presented to a high professional standard, to mold their attitude to their work and the Center organization.

22.- Refresher, remedial and retraining schemes should be included in the Center's Policy, and all staff must understand that they will be given such courses at regular intervals during their career.

This training must be provided by outside experts and in different fields of interest.

23.- Every division head must be given responsibility for running his division or unit and each individual allowed to perform his tasks to the best of his ability, with full support and encouragement from above.

24.- Performance targets must be set for each division, section, unit and individual, and achievement of those targets must be evaluated regularly, so that all can be made accountable for achieving the prescribed objectives.

CONCLUSION

This study was initiated to investigate the STCW Convention application, prompted by the crisis currently facing the existing seafarers in Honduras and motivated by the strong desire to improve the situation. It is, of course, just a tiny part of the structure needed to establish the intended objective. It has proposed structural set up, curriculum outline, manning requirements, and some recommendations which it is considered will lead to better planning and managing of the new institution.

Much more work, in greater detail, will clearly be needed to prepare a package that can be presented to higher authorities, in order that they can conduct proper actions internally or out of the country to raise the proper funding for the accomplishment of the project. The present work is intended to set that process in motion and to provide a basis for discussion. It is hope that it will generate interest,
dialogue and (ultimately) action, as a contribution to the alleviation of seafarers' present training difficulties.

BIBLIOGRAPHY

1. International Conference on Training and Certification of Seafarers (STCW 1978), IMO, London.

2. O.D. Lascoe, C.A. Nelson and H.W. Porter, Machine Shop Operations and Setups, 1973.

3. Noel Entwistle, Handbook of Educational Ideas and Practices.

4. Educational Planning, OECD, 1983.s

5. Educational Studies and Documents, UNESCO, 1987.

6. Division Officer's Guide, Naval Insitute Press.

7. John W. Wright, The Universal Almanac, 1990.

8. Proceedings of Seminar on Seafarers'Training and Certification, Tokyo, 1983.

9. Vocational Training of Seafarers, ICO, 1967.

10. Richard Nichol, School Management.

11. Dr. B.J. Thomas, Dr. D.K. Roach, Management of Maintenance, 1989.

12. Ship's Mechanic Curriculum, German Seafarers School, Travemünde.

13. Pre-Sea Training for Ratings. Curriculum. The National Sea Training College, Gravesend, England.

14. IMO Model Courses, IMO, London.

15. Curriculum Training- Course, Nautical College " Willem Barntsz", The Netherlands.