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## Need of providing additional training facilities in the east and southern African sub region

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WORLD MARITIME UNIVERSITY  
MALMÖ, SWEDEN

THE NEED OF PROVIDING ADDITIONAL MARITIME TRAINING FACILITIES  
IN THE EAST AND SOUTHERN AFRICAN SUB REGION

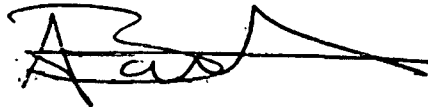
by  
Adham Mohamed Basty  
Kenya

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

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

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

Signature:



Date: 31 October 1988


Supervised and assessed by:

Hans van Walen  
Lecturer  
World Maritime University



Co-assessed by:

Klaus E. Mangels  
Professor  
Hochschule Bremen  
FRG  
Visiting Professor World Maritime University



THE NEED OF PROVIDING ADDITIONAL MARITIME TRAINING  
FACILITIES IN THE EAST AND SOUTHRN AFRICAN SUB-REGION.

BY

ADHAM MOHAMED BASTY

WORLD MARITIME UNIVERSITY  
CITADELLSVAGEN 29  
P.O. BOX 500  
S 201 24 MALMO SWEDEN  
18th OCTOBER, 1988.

To AISHA, HUDAA, HABENA and MBARUK.

## ABSTRACT

Substantial increase in the cost of maritime training for countries in Eastern and Southern Africa calls for an Inter-regional approach both in policy and educational institutions.

This paper discusses the implication of manpower needs for shipborn services, lake services and other associated shipping activities. It looks at MET with a broader view over the whole region and recommends concerted efforts among the member regional states to work together. It also looks at the changes in MET during the last 10 years and other related activities that are necessary to ensure the future needs of these countries to produce efficient and safe personnel.

Finally, the guidelines for a plan of action recommended by the author, will be set out based on interviews, work experience in this field, literature research, passed activities and also studies undertaken by IMO, NORAD, ILO and UNCTAD.

The main objective of this study is to show the need of providing an additional maritime Training Facilities that will cater for the whole region at a minimum cost and high efficiency.

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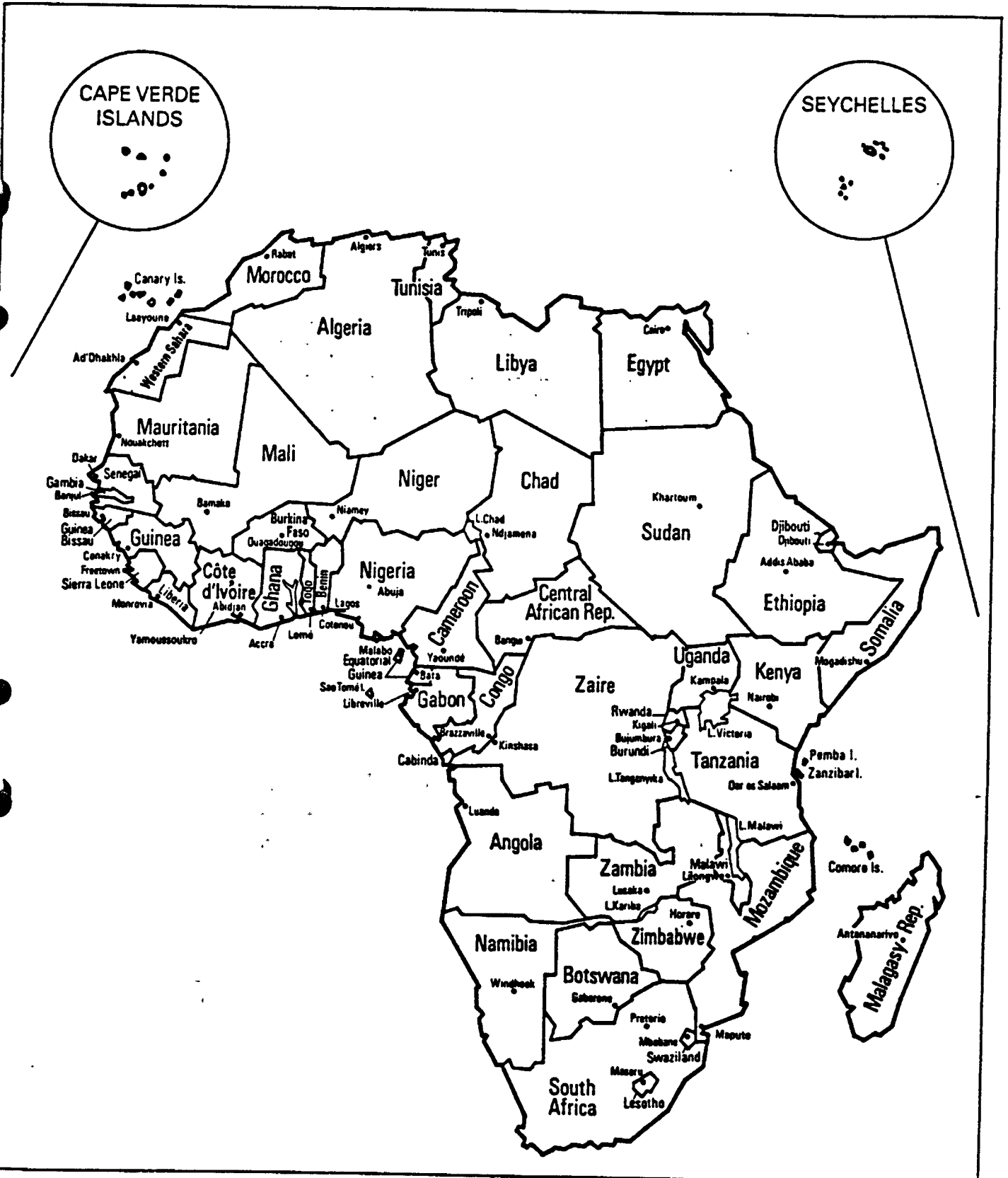
Special thanks are due to my wife Aisha, daughters Hudaa and Habena and son Mbaruk for their patience and sacrifice during the two years that I have been away from home. They never failed to telephone or scribble few lines of encouragement to make my stay in the WMU a treasured one.

A.M.B.

## ABBREVIATIONS USED.

1. A.E.D..... Africa Economic Digest.
2. B.Tech..... Business Technical Diploma in  
Nautical Science.
3. D.Tp.....Department of Transport.
4. DWT.....Deadweight Tonnage.
5. E.C.A.....Economic Commission of Africa.
6. I.M.O.....International Maritime Organisation.
7. I.L.O.....International Labour Organisation.
8. ISCOS.....Intr-Governmental Standing Committee  
on Shipping.
9. NRT.....Nett Registered Tonnage.
10. KPA.....Kenya Ports Authority.
11. PTA..... Preferential Trade Area.
12. PMAESA.....Port Management Association of  
Eastern and Southern Africa.
13. SCOTVEC.....Scotish Vocational Education Council
14. STCW.1978..... Standards of Training Certification  
and Watchkeeping 1978.
15. THA.....Tanzania Harbours Authority.
16. UNCTAD.....United Nation Conference on Trade  
and Development.

# SUB-SAHARAN AFRICA



## INTRODUCTION

Maritime transport serves world trade. The basis of the very existence of maritime transport is the cargo. About 75% of all the world trade is seaborne. The East African region is part and parcel of the International community whose trade, which amounts to more than 95% import and export relies on Maritime transport. The region traditionally relies heavily on its export of commodities and raw materials and imports of finished products.

It is on this basis that the region needs an efficient and effective Maritime transport infrastructure. For every effective organisation, training plays an important part. Training is a progressive process and not a temporary uncontinuous process. Technology changes, and so does the methodology and needs of an industry. Port operations in the 1960s were more labour intensive less machinery involvement. Today in most of the ports containerisation is not something new. On board ships today's training of the officer is not the same as that of the 1960s. Therefore training is an essential tool for assisting and improving the performance and effectiveness of the Maritime transport Industry.

Technological developments today have called for a better quality of personnel. Modern ships and ports today are becoming more and more sophisticated with the utilisation of computers and newly developed techniques. These developments will require both a seafarer and a port officer to be educated and properly trained in their fields. These industries are becoming more and more competitive and sensitive in all fields and require a persons who will be more vigilant in his work. Ships and



Ports are very capital intensive investment and require high calibre people to manage them efficiently so that they can be worth the investments put into them.

Table No. 1. East and Southern African Countries Area and Population --1985.

Country	Population	Area in sq.km.
Burundi	4421000	27,834
Comoros	408000	2236
Djibouti	450000	21783
Ethiopia	42289000	1,223,600
Kenya	20194000	580,367
Madagascar	9941000	587,041
Malawi	7056000	118,484
Mauritius	983335	2,040
Mozambique	1376000	799,380
Seychelles	64314	444
Somalia	7595000	637,657
Sudan	21761000	2,505,813
Tanzania	21733000	945,087
Uganda	14733000	197,058
Zambia	6770000	752,614

*Source Africa Contemporary Records 1984-86.*

## CHAPTER ONE

### 1.1 The Sub region.

The sub region that will be referred to in this thesis consists of 11 Coastal states including Indian Ocean Islands States and 4 land locked States. They are Burundi, Comoros, Djibouti, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Seychelles, Somalia, Sudan, Tanzania, Uganda, and Zambia. The Sub region stretches from North Eastern End of Africa to the heart of south central part of the African Continent. The area covered is boarded by Red sea in the north the Arabia Gulf in the Northern Eastern, and Indian Ocean on the east. It has a land area of approximately 8401438 square kilometers. The Sub region Ocean states include countries such as Seychelles, Mauritius, Comoros and Madagascar. These are all in the Indian Ocean. Four states are land locked namely, Uganda, Burundi, Malawi and Zambia. They are all involved in Inland water ways transport network.

### 1.2 Inter Regional Cooperation.

Here a question might be asked why all these countries? Without going into much details all these countries are already bounded by other cooperation Associations. There is the Port Management Association of Eastern and Southern Africa (PMAESA) which is an ECA sponsored organisation. The member states of PMAESA are nearly the same as the ones i have stated above with exception of Uganda, Comoros, and Zambia. Malawi is the only land locked country in the Assosiation. This assosiation was formed in 1973. Among other aims and objectives of the Association is to provide a forum for the members of the

Association to exchange views on common problems such as Training of Port personnel and Seafarers. This has been discussed at several meetings in the past.

There is also the Preferential Trade Area (PTA). This is an economic cooperation body which comprises about 18 countries in the sub region. Then there is the Eastern and Southern African Trade Promotion and Training Centre (ESATPTC) which was established in 1974 in Nairobi. At the moment it has 18 Member states. The list is long but the ultimate aim of all these associations is to put resources together so that in whatever endeavour is aimed at a maximum benefit is reaped by the member states.

### 1.3 Population.

The estimated population in the Sub region in 1985 was estimated to be 172,459,314 ( According to African Contemporary 1984-86). The most populated country in the region being Ethiopia with a population of 42,289,000.

### 1.4 Language.

The principal language in the area is English, because most of the countries were once British colonies. English is the official communication language in the existing regional cooperation bodies that are in existence at the moment.

### 1.5 Principal ports in the sub region.

The coasts of the sub region offer four principal ports in the Red sea ,(Port Sudan- Sudan, Massawa and Assab- Ethiopia, and Djibouti-Republic of Djibouti). One port in the Gulf of Aden (Berbera- Somalia). and 11 other prici-

pal ports in the Indian Ocean including Indian Ocean Islands states. These ports are:

Mogadisho- Somalia, Mombasa-Kenya, Dar es Salaam- Tanzania, Nacala Beira and Maputo -Mozambique, Tomasina and Muhajanga- Madagascar, Port Louis-Mauritius, Mutsamudu- Comoros and Port Victoria -Mahe - Seychelles.

Most of these ocean terminals are advantageously situated in relation to maritime and with the exception of a few ports like Assab in Ethiopia and Mogadisho in Somalia on the main land, the rest are served by rails to their hinter-lands. Like sea ports elsewhere, seaports in the sub region are significant points of economic and cultural contact. They are vital links between the sub region, the hinterlands and the interior in general which require opening up for development. The importance of these ports in the Maritime Industry as a whole is considerable, not only for the Coastal countries, but also for the land -locked countries lying behind them and which are dependent upon them for their import and export.

#### 1.6 Port Activities.

For comparison purpose some statistical data of some of the major ports of the Sub region are given on the next page in Table No.2. The purpose here is to show some comparison of traffic of ports handled in the early years and of recent times.

From the statistical data provided next page, it can be seen that in the case of Comoros, Djibouti and Mozambique Ports there is a decline on the tonnage of cargo that has been handled in these ports. Since Djibouti and Mozambique Ports are transit ports, their activities would

TABLE NO. 2 INTERNATIONAL AND COASTAL SHIPPING.

COUNTRY	YEAR	NO. OF SHIPS	CARGO IN TONS
1 Comoros	1974	981	92000
(the whole	1975	669	68500
archipe-	1976	651	63100
lago)			
2. Ethiopia			
a) Assab Port	1960	592	0.83 million
	1982	539	2.1 million
b) Massawa	1960	766	0.4 million
Port	1982	190	0.4 million
3. Kenya			
(Mombasa	1977	1133	5.8 million
Port)	1981	865	8.8 million
4. Djibouti	1960	2091	1.9 million
	1982	1007	1.0 million
5. Madagascar			
(All Ports)	1971	362	2.3 million
	1981	327	2.2 million
6. Mauritius			
(Port Louis)	1971	120	1.5 million
	1980	125	2.1 million
7. Mozambique			
a) Maputo/	1974	1503	14.0 million
Matola Ports	1981	1050	6.3 million

Table 2 Cont....

b) Beira	1965	65	4.6 million
	1981	418	1.6 million
c) Nacala	1965	48	0.3 million
	1981	219	0.8 million
8. Seychelles	1971	121	0.09 million
	1981	210	0.18 million
9. Somalia (All ports)	1965	480	0.6 million
	1975	656	0.8 million
10. Sudan (Port Sudan)	1964	1166	2.4 million
	1981	1214	4.0 million
11. Tanzania (All Ports)	1965	650	0.82 million
	1982	1288	3.8 million

*Source: Joint ECA/PMAESA Report on training needs and Facilities for Ports of Eastern and Southern Africa. (OCT 1983)*

depend mostly on the imports and exports and potentials of their port users. The question of Comoros may be the question of development. There are some improvements in cargo traffic activities in the following ports: Assab, Mombasa, Port Louis, Port Victoria, Somalia ports, Port Sudan and Tanzania ports. Ports which have not shown much improvement in their activities are Massawa port in Ethiopia and Madagascar ports.

### 1.7 Shipping Activities.

By virtue of its situation Eastern and Southern Africa Sub region including Indian ocean Island states served for a long time as a stop over for ships en-route from Europe to India and the Far East. Traffic of the Indian Ocean and the Red Sea to the Mediterranean and Europe owes its modern development, of course, to the opening of the Suez Canal in 1869. The canal is a vital sea route to the development of sea ports and shipping in the Sub region. From Eastern and Southern Africa and the Persian Gulf areas to North West European and United States East Coast sea distance would be less by 4700 and 3700 nautical miles respectively due to the existence of the canal. Such cut in distance would definitely have greater impact on sailing time and freight rates.

The sub region is served both with liner conference vessels and non-conference vessels. To this, National carriers are added either in the form of Coastal services or in the form of deep sea shipping. (See Table No.7 and 8 chapter 3.). The development of National Carriers is not yet fully undertaken in the Sub region and at present there are only few countries that have established National carriers of deep sea shipping service. Hence, the par-



participation of national vessels in the external trade of the countries of the Sub-region is minimal. The participation of foreign vessels in the external trade of the countries of the Sub-region is today 97 per cent vis-a-vis 3 per cent for national vessels according to ECA/PMAE-SA Report on training needs and facilities for ports of Eastern and Southern Africa 1983. The situation upto this date has not changed much.

Presently the only countries that have an established deep sea shipping service in their National lines are Ethiopia, Madagascar, Mauritius, Sudan and Tanzania.

Table No. 7 shows the total number of the Sub region Ocean Going fleet and the total Gross Registered Tonnage, as it stands today. It is a very low figure to make any comparison with those of the Rest of Africa as well as world cargo and shipping tonnages. As to their participation in the external trade it is minimal (3% only) and it might take longer time for the maritime countries in the Sub region to attain the 40/40/20 per cent cargo share formula as envisaged in the code of conduct for liner Conference.

Coastal Shipping development in the Sub region has been taking place on individual country basis rather than Sub regional. Despite the many efforts made by individual countries to develop Coastal Shipping Sub regionally the desired results have not yet been achieved. One of the reasons for this is lack of co-ordination to survey the existing capability and present state of nationally owned Coastwise and inter-Island shipping services and facilities including ports, and of the present trade flows to

co-ordinate Coastal shipping services in the Sub-region.

The following countries have Coastal shipping services established: Ethiopia, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia and Tanzania. (See also table No. 7 ).

## CHAPTER II.

### MET SYSTEMS AND TRAINING INSTITUTIONS IN THE SUBREGION.

#### PART ONE.

Maritime Education and Training Systems in the Sub region.

#### 2.1 The Sub Region.

Most of the countries in the Sub region do not have any national shipping policies. In other words, no policies exist in most of these countries to provide guidelines on ports, ships financing, legislation, and Maritime Education and Training system. So far the types of training that exist are the ones inherited from the colonists. As a result of which there is the British system, French system, Italian system and so on. In fact these developed countries have in the recent past updated their own system but it is still common in the region to see the old system in existence. None of the countries mentioned in the sub region have any legislation that covers training of seafarers.

Traditionally Kenya, Uganda, Tanzania, Zambia and Malawi have been training their personnel in Britain. The British Maritime Education and Training system was and still is the system in these countries.

## 2.2 Tanzania.

Recently Tanzania acceded the IMO Convention on standards of training certification and watchkeeping 1978. (STCW 1978). This convention came into force on the 28th April 1984. Now Tanzania has its own system of Maritime Education and Training which stemmed from the STCW Convention, but it has no legislation for it.

Establishment of Dar es Salaam Maritime Training Unit in Tanzania by NORAD in 1978, was a turning point for Tanzania in the field of MET system. In other words a comprehensive scheme of Maritime Training system was introduced where by a steady stream of both engineers and deck officers have been produced since 1979 for the local fleets. All trainees are recruited by shipping company before are allowed at D.M.T.U.. They must have passed O level standard of education and they must undergo medical examination, eye sight etc. Then they are taken for full one year course at the school. This is like the United Kingdom system which existed in 1960s. The cadets then do an examination and after passing go to sea for 12 months to get their sea time. After completing their sea time they then return to D.M.T.U. for 6 months and prepare to take their Class 3 Certificate examination. For lack of demand for the higher classes of certificates training is only offered upto class 3 Deck and Engineering only. For higher grades students are sent to Alexandria Maritime Transport Academy in Egypt.

## 2.3 Kenya.

Kenya on the other hand has no Maritime Policy and therefore no MET system of its own. It has been following the

British system since it started training its personnel in the early 60s. Maritime activities in Kenya as a whole have received a very low profile since the break of the Eastern African National Shipping Line in 1980 and the closing down of Southern line Ltd. in 1979. Shipping has not been taken seriously, neither the Government nor by the private sector. As a result of which training of seafarers has been left to individuals and Kenya Ports Authority. The latter trains seafarers to come and serve in Ports as either Pilots Or Marine Engineers and some times Tug Masters. Kenya has not yet ratified the IMO. Convention on Standards of Training Certification and Watchkeeping 1978., although interest has been expressed at a number of times.

Kenya however under its Merchant Shipping Act. of 1967, (-wich is a duplicate of the British merchant shipping act. of 1896) do issue Certificates of Competency for people who are qualified and passed examinations conducted by the Harbour Masters Office for deck certificates and Senior Marine Engineer Office for Engineering Certificate.

The Certificates issued are:

- a) Third Mate of a foreingoing ship.
- b) Master of a Coasting vessel not exceeding 500NRT.
- c) Mate of a Coasting vessel not exceeding 500NRT.
- d) Master of a Coasting vessel not exceeding 100NRT.
- e) Third Class Engineer.

By reading the examination syllabuses, carefully, it is evident that the Third Mate and the Third Engineer Certificates are to some extent equivalent in level to the officer Watchkeeping Certificates contained in the IMO. STCW. 1978 Convention (regulations 11/4 and 111/4. see

annex 1.)

Again these certificates are issued as Kenya Certificates but the system followed is the same as that of Great Britain. No formal education is required. All that is necessary is to have sufficient sea time, be physically fit and having passed eye sight tests.

During the east African Community days in early sixties, Kenya sent her first trainees to Britain for aquaring maritime education and training so that on their return after qualifying as Master Mariners or 1st. Class Engineers to come and serve in the joint common services of Harbours and Lakes services, shared by Kenya, Uganda, and Tanzania. The three countries got independence from Britain nearly at the same time. Tanzania, then, Tanganyika, won her independence on 9th. december, 1961, followed by Uganda in 21st. October, 1962. and then Kenya on 12th. December, 1963. Before independence the colonial Master, Britain had taken the initiative of recruiting the first batch of "Cadets Officers" as they were called to train in seafaring in Britain. By then none of the three East African Countries had any Shipping Line of their own, apart from some limited shipping activities conducted by Southern lines ltd. and the Lakes Services. Southern Lines Ltd. was a Kenyan registered Shipping company created in 1957, with foreign interests. It owned 4 Coasters which used to trade along East African Coast, Indian Ocean Islands and the Red Seas areas. Zanzibar on the other hand had 2 Passenger cargo ships which were owned by the Sultan of Zanzibar then. They were used to serve the Islands of Pemba and Zanziba. But, Zanzibar was not in the East African Community.

On returnig these Officers as said earlier were to serve

in the Lakes Services and Harbours jointly owned by Governments of Tanzania, Kenya, and Uganda. The majority of these officers never returned until late 70s due to lack of employments on declining British Merchant marine fleet. Due to lack of Policy and guide lines the cadets were to train in British Colleges and serve their sea time on British ships as long as they wished provided they come back to their respective countries on attaining the highest Certificates, (Master Mariner, or 1st. Class Engineer). This was a loose arrangement, and until this date some of the officers are still at large. This could be attributed to lack of firm policies, inadequate incentives and limited opportunities on return.

We can say Maritime Education and Training in the three countries, Kenya, Uganda and Tanzania was started in 1957 when the Lake services opened their first Seamanship Centre at Kisumu on the shores of lake Victoria. The fundamental aim was, during those colonial days to train Africans seamanship skills.

#### 2.4 Mozambique.

Mozambique Maritime Education and Training system was partly inherited from the Portuguese system and partly their own creation. Mozambique was a Portuguese colony for a number of years until 1975 when she won her independence. The coast line of Mozambique has a total length of about 3600 kilometres and almost directly faces the island of Madagascar from which it is separated by the Mozambique Channel. Mozambique has in the short time after acquiring independence realised the importance of shipping activities. In 1978 the Mozambique Authority only 3 years after independence realised the importance of

Maritime Transportation and established a National Directorate for Maritime and Inland waters Transport under the Ministry of Transport and Communications.

Mozambique has 3 principal ports namely Maputo, Nacala, and Beira. These ports also serve her landlocked neighbours such as Malawi, Zambia and Zimbabwe. There is a merchant fleet of considerable size 75,000GRT (L.R.S registered 1985) The biggest ship owner is the National Shipping Company known as NAVIQUE.E- Empresa Mocambicana de Navegacao. She is the only largest shipping company in the country.

Again in this country Maritime Education and Training system. is not clearly defined under the M.S.A. which falls under the National Directorate of Maritime and Inland water Transport, which is a body of the Ministry of Transport and Communications. General Education system in the country is very young and so is the the Maritime Education and Training. In 1975, out of a population of 12million only 3%-5% of the Mozambican population were to be considered educated. (according to Atanasio Francisco)

Maritime Training in Mozambique is conducted by the Escola Nautica de Mocambique EN (Nautical School of Mozambique) which is in Maputo city. This institution was founded in 1977, two years after attaining independence.

The quality of training at this institution did not meet the S.T.C.W. standards due to inadequacy of infrastructure and program of the Nautical School.(1) With the help of NORAD and IMO, Mozambique in 1983 renovated the school and upgraded their programs in order to



produce ship officers with certificates meeting the standards of International Convention on STCW.1978. requirements. This was a prerequisite before acceding to the STCW Convention in November the 15th. 1985.As their neighbours Tanzanians, Mozambique also produces only lower classes of Certificates and for higher classes, 2nd Classes and above overseas training is sought.

## 2.5 Madagascar.

Maritime Education and Training in Madagascar is based on the French system. Madagascar was once a French colony and their culture and Education system still exist in the country.Madagascar understood the problem of properly trained personnel nearly 20years ago when they established their national fleet. They formulated a comprehensive program of training that a trainee enters with a minimum entry standard after leaving high school and progresses until he acquires Nationaly and Internationally recognised qualifications.

Training for seafarers for the 'Cabotage' Home trade and Fishing is done locally at the ENEM of Mahajanga, but that for personnel of ocean going vessels, training is done overseas. The table on page 20 gives the minimum pre-entry requirements for entry into this maritime academy and the stages followed to achieve Eleve Capitaine au Cabotage-Ecc. This is highest qualification offered in the country for deck officers. With this certificate the holder can serve on ships trading in the Cabotage trade only.

On finishing high school, a student can be qualified to enter into the ENEM of Mahajanga provided he has good eye

sight and is physical fit. He then studies for 3 years at the academy at the end of which he is awarded a diploma. He then has to serve for 12 months at sea and gets his Mate certificate. On getting his Mate certificate he has to go back to sea for 48 months before he can go back to the academy for his Master or 24 months sea time if he has served as a Mate. By then he takes a one year course at the academy and gets his Masters (Eleve Capitaine au cabotage).

For Engineers there are two certificates that are offered. The entry qualifications are O level Technical school or Auto diesel engine engineering certificates. The course lasts for two years. At the end of two years and the candidate passes an examination, he is offered an Eleve officer Mecanicien de 3e Classe- EOM3. With this qualification he can serve as a chief Engineer on a Fishing vessel of less than 500kW engine power or 2nd Engineer on a ship of less than 750kW engine power or a Watch keeping engineer on a ship of less than 1500kW engine power. After serving for more than 36 months on board, the engine power restriction can be doubled.

The other class of engineers certificate is Eleve Officer Mechanicien de 2e Classe-EOM2. There are three approaches for this certificate, one is to start with A level high school certificate (Technical) or to start with automobile diesel engine electrotechnic certificate, or certificate of competency as OM3. The student must be at least 18 years old. The course is for 3 years and on passing the final examination the candidate is awarded an Eleve Officer Mecanicien de 2e classe-EOM2. With this certificate the officer can serve as a chief engineer on a ship of less than 8,000kW power with 48 months sea

service.

## EDUCATION OF SEAFARING PERSONNEL IN MADAGASCAR.

Courses provided at the E.N.E.M. Mahajanga

Level of Entry	Entry Qualification	Duration of Courses
Master for a Coastal trade	48 months at sea at least 24 months as a mate	1 year
2nd Class Engineer Officer	A level Tech.School Cert.or have a Cert. of speciality automobile diesel engine,electrotechnic, -- owner of cert. of competency OM3 18 years old.	
Master of a Fishing vessel	36months at sea in fishing Vls. after L.P. Cert.	1 year
Mate of a Coastal trade Ship (EOC)	Candidate must have classe 1ere be 18 years old with good eye sight.	3years +1year at sea

3rd. Class Engineer (EOM3) Candidate must have 2years.  
level BAE or 0 level  
technical or auto diesel  
engine Cert.  
Must have good eye sight.

Mate of a Fishing Vessel Candidate must have 2 years+8  
0level Cert. Months at  
8years at sea in fishing sea.  
vessels,must be 18 years  
old & must have  
a good eye sight

*Source Gazetim-Panjakan NY Repoblika Malagasy 31st  
Aogositra 1974.)*

## 2.6 Somalia.

In Somalia there is no training system for ratings but there is one for officers. Officers training starts at a local secondary school for both Nautical and Engineering students. The pre-entry requirement is an intermediate school certificate which is issued by the Ministry of Education after 8 years of basic education. The school is also under the same ministry and is part of general special education of 4 years of studies. There are only two secondary schools of this type in the whole country, one in the capital Mogadiscio and another one in Brava. Graduates from this special secondary school either continue with seafaring by joining local shipping companies as cadets to get their sea time or work in the country as any secondary school leavers but sometimes with shipping agencies or ports. During their 4 years of secondary education they also learn General seamanship, rowing, sailing, Chipping and painting.

The training and certification offered in the country is for Coasting certificates after completing the required sea time. The Coasting Certificates issued in the country are not International recognised but enable local Officers to serve on Somalia registered coasting ships. These ships normally trade along the East African Coast, the Red sea area, and the Gulf waters. Somalia has a small shipping fleet as shown in table no 4.

Training for those who want to serve on ocean going ships, training is sought overseas. Somalia train these officers in Egypt, United Kingdom, Italy, Sharja and Soviet Union (USSR). In these countries these trainees follow different type of training as per the host country

system. Some follow a degree course in Nautical Scienceö-Marine Engineering or follow the sandwich courses to attain the highest qualifications as Master Mariners or 1st. Class Marine Engineers. Somalia like her neighbour Kenya has not yet ratified the IMO Convention on standards of Trainig, Certification and Watchkeeping for Seafarers 1978.

## 2.7 The rest of the Sub region.

Maritime education and training in the remaining countries in the sub region are less significant or non existence at all. This may be attributed to so many factors, such as limited maritime activities in the country, (especially the land locked countries which relies on foreign countries for their training. These require certificated officers according to their regulations to man their vessels in the lakes services) non existence of Maritime awareness and commitments, less priority given to training of seafarers or port operation personnel. Employees have to live with on the job training, depending more on the type of "Nelly" that they are placed next to. In other countries training activities are so fragmented that it is almost impossible to visualise how they manage to continue in the industry which is so Capital intensive investment or are they eating away the very profits that are supposed to make.

PART TWO.

MARITIME TRAINING INSTITUTIONS IN THE SUB REGION.

2.8 Established Training Institutions in  
the Sub region

There are currently eight well established training institutions in the sub region. These are:

- (i) BANDARI COLLEGE IN MOMBASA KENYA.
- (ii) BANDARI COLLEGE IN DAR ES SALAAM TANZANIA.
- (iii) DAR ES SALAAM MARITIME TRAINING UNIT TANZANIA.
- (iv) MBEGANI FISHERIES DEVELOPMENT CENTRE DAR ES SALAAM TANZANIA.
- (v) SOMALI PORT TRAINING SCHOOL MOGADISCIO SOMALIA.
- (vi) MARITIME TRAINING INSTITUTE MAJUNGI MADAGASCA.
- (vii) ESCOLA NAUTICA DE MOCAMBIQUE (Nautical School of Mozambique).
- (viii) SEAPORT CORPORATION SCHOOL PORT SUDAN SUDAN.

These are well established in so far as infrastructure are concerned.

2.9 (a) Institutions that train Seafarers.

Despite the inadequacy of Maritime training institutions in the sub region, efforts have been made to start a few. However, apart from the following institutions the majority of these train only port operation personnel:

- (a) DAR ES SALAAM MARITIME TRAINING UNIT in TANZANIA.
- (b) MBEGANI FISHERIES DEVELOPMENT CENTRE in TANZANIA.
- (c) MARITIME TRAINING INSTITUTE MAJUNGA in MADAGASCA.
- (d) ESCOLA NAUTICA DE MOCAMBIQUE in MOZAMBIQUE.

(b) Institutions that train Port operation Personnel.

- (A) BANDARI COLLEGE in MOMBASA KENYA.
- (B) BANDARI COLLEGE in DES SALAAM TANZANIA.
- (C) SEAPORT COORPORATION TRAINIG SCHOOL in PORT SUDAN SUDAN.
- (D) SOMALI PORTS TRAINIG SCHOOL in MOGADISCIO SOMALIA.

Properly trained manpower both to serve ports and shipping has been a problem since independence in the sub region. Trainig for high calibra cadre has been undertaken outside the countries for years depending on fellowships from doner countries. On the otherhand trainig for the lower grades have been non existence or poorly trained due to lack of adequate facilities in some countries or where facilities exist, inadequate use of the same. All in all the very high cost of trainig on individual countries have imposed constraints on how many can be trained.

As i have said earlier some trainig facilities do exist in some countries in the sub region but no effort have been made to share these facilities. As a result of which the trend has been for each country to plan on establishing its own trainig institution. Resulting in farther drawbacks due to showdy infrustracture and equipments and thus substandard trainig. All these atributed to luck of funds which has been the biggest constraint in the sub region.



## 2.10. Bandari College Mombasa.

This institution, completed in May 1980, is owned by the Kenya Ports Authority (KPA). It has excellent training facilities of up to date standards(see annex No.3 ).It has twenty lecture rooms,a modern well equipped library, five engineering workshops, hostel facilities for about sixty trainees, a confrence hall,big kitchen with refregeration facilities,Administration offices and asea terminal.

The College has a capacity for about 500 trainees per year.At present the facilities operate only 40% capacity confining its activities to the needs of KPA only. Afew courses and seminers with perticipation from the sub region have been organised now and again.

In addition an UNCTAD project on the Maritime Transport Trainig TRINMAR is also located at the college and has been developing courses for port operation personnel since 1980. TRINMAR has now become a source for curriculum development for the operation unit of the College. These courses have now been passed to other ports in the sub region who are adapting them for their use.

The college is in the process of expanding its curriculum to include nautical studies.

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*(Source Bandari College Brochuer 1987).*

The college has expressed readiness to offer courses in English to the ports in the sub region provided that such requests are properly coordinated and adequate time provided for designing the courses such being tailor made to suit the needs of the individual ports. Details of the course offered see annex 3.

## CHAPTER THREE

### TRAINING AND MANPOWER NEEDS.

#### 3.1 Introduction.

Shipping activities and their development are an integrated process. The development of human resources in these integrated process of shipping industry is vital. A successful operation of shipping industry would not be meaningful without the availability of skilled manpower both for the shore based activities and for the seafarers.

Maritime Education and Training is important for any developed maritime nation, but it is more important for a developing maritime nation. This is so because it has to start from the scratch. Our countries in the sub region some of them have no maritime background, traditions or appreciation. But they have today joined the International community in competing in maritime transport trade. The infrastructure of which is vassatile, fragile and cost intensive. Technology has been high and is growing day by day. With the introduction of more and more sophisticated equipments, the requirement of training is continuously increasing for both developed and developing nations.

Most of the countries in the sub region have a national fleet of some significance importance in their national developments. Others have lakes services which plays a big part in their national and international transport network. To provide these services efficiently and effectively with competent personnel who understand clearly

the requirements as to the safety of the ship, cargo and to himself, the person performing the task must be well trained and educated. But why do we need to educate and train our personnel? Developed countries are fighting hard to reduce manning on ships but our fighting in the 3rd. world is to see that our labour force become more productive. to do this we have to educate and train them so that they can conquer the chaleng ahead and do better in their endeavor.

The region needs to develop its human resources so as to provide the means of maximizing the productivity of the already established infrastructures such as ports, lake services, coastal and ocean going vessels. The development of such human resources are bound to be affected by the prevailing economic, social and political conditions that are existing in the region. It goes without saying that these elements human existence cannot be seperated and their influence would be felt all along. But the region has to look for realities in a positive maner and not in the negative side of it.

For the positive side of it ,the region should asses and ensure the availability of resorces that are available. It should plan the future trained manpower needs that would serve the aforesaid three activities in the region namely Ports, Lake Services and Seafaring.

### 3.2. GENERAL CONCEPTS OF MANPOWER PLANNING.

#### Introduction.

It is self evident that no organisation can achieve its results other than through people. It is also important

that the right people are available with the appropriate skills whenever and wherever they are required and that when they are in position they perform. This principle is supported by the ILO's observation that "man is the pivot of economic and social progress, but he cannot contribute to national development if he lacks qualification or if he is badly utilised". These perceptions are rather forceful in justifying the utilization of the concept of Manpower/Human Resource Planning in the maritime industry in general and in satisfying the education and training requirements in particular. (Beache, 1980 Wilson, 1981)

### 3.3. MANPOWER PLANNING Definition.

Manpower Planning may be referred to as Human Resource Planning and Personnel Planning and Employment. Although the terms interchangeable the general definition points to a single interpretation, that is, "a process for determining and assessing that the organisation will have an adequate number of qualified persons available at the proper times, performing jobs which meet the needs of the enterprise while at the same time these individuals derive some satisfaction from their involvement". In addition to this generalized definition others have been put forward and these include.

- a) "attribution to achieve a balance between supply and demand for manpower".
- b) "a scientific method depending on forecasting the economic and social variable for a fixed time aiming to determine supply of and demand for manpower".
- c) "the process of forecasting both qualitatively and quantitatively the manpower needs of the enterprise in relation to current and anticipated business needs

resulting from internal and external changing conditions.

### 3.4. The Scope of Manpower Planning.

Irrespective of the definition or terminology preferred, the process of manpower planning is an ongoing one- not static and involves many interrelated activities. The plan must be modified and updated as conditions require. In more specific details it involves the planning development and implementation of human resources programmes to include activities such as:

- a) forecasting future manpower requirements either in terms of mathematical projections of trends in the economy and developments in the industry or of judgemental estimates based on specific future plans of the company, enterprise or a nation.
- b) inventorying present manpower resources and analysing the degree to which these resources are employed optimally.
- c) anticipating manpower problems by projecting present resources into the future and comparing them with the forecast of requirements to determine their adequacy both quantitatively and qualitatively.
- d) planning the necessary programmes of recruitment, selection, promotion, training, motivation and compensation so that the needs of the enterprise can be met.

### 3.5. Some Reasons for Manpower Planning.

Many reasons and explanations have been advanced to justify and support the need for systematic manpower planning as an integrated process in the establishment and operation of many enterprises. Among some of the more significant are:

a) Future Personnel Needs-

Planning is vital for determining personnel needs for the future-

b) Coping with Changes.

Manpower planning enables the nation or enterprise to cope with changes in technology, competitive forces, markets, products and government regulations. Such changes often generate changes in job content, skills demands, numbers and types of personnel. Shortages of people may be induced in some areas while surpluses may occur in others.

c) High Talent Personnel.

The mix of personnel employed in many modern enterprises has shifted towards the high talent occupation and there is often a scarcity in this group. The lead time required to hire and develop such personnel is long and the enterprise can be vulnerable if there is a shortage. Planning is therefore necessary to avert this element. In addition, technological changes often upgrade some jobs and downgrade others. All these considerations should be included in manpower planning.

d) Strategic Planning

All modern competitive enterprises engage in strategic planning as top management evaluates the environment in which the organizations operate and assesses strengths and weaknesses, sets objectives and determines programmes for future implementation. Manpower planning is an essential component of this strategic planning

e) Foundation for Personnel Functions.

Manpower planning provides essential information for

designing and implementing personnel functions such as recruitment, selection, transfer, promotion, layoffs, training and personnel development.

### 3.6. THE MANPOWER PLANNING PROCESS.

The major components of the manpower planning process include (i) goals and plans of the organisation, (ii) current manpower situation, (iii) manpower forecast, (iv) Implementation of programmes and (v) audit and adjustments.

Although organisations may differ substantially in the degree of sophistication, in doing their manpower planning the two principal facets are the "demand side" and the "supply side". In the process these must be reconciled.

### 3.7. The Demand Side of the Manpower Planning Process

In practice, it is impossible to foresee needs very far ahead and any substantial and costly efforts to forecast long term needs are hardly justifiable. However in the attempts to produce appreciations of possible long term developments it may well be worthwhile. Generally, however, and bearing in mind the very many uncertainties, the best safeguard against long term surplus or shortages is the deliberate cultivation of flexible attitudes towards manpower planning demand studies.

Statistical techniques play a useful part in the forecasting of future manpower demand, but this may not be the whole picture. These techniques identify and measure trends and relationships which have been established in



the past and projected into the future on the assumption that these same trends and relationships will continue. However, due allowances must be made for changes which may break these established trends and relationships. These changes on the other hand may be influenced by technological changes, changes in the economic, social and political environment in which the organisation operates, policy changes and objectives of the organisation itself and so on.

There apparently can be no simple rule of thumb method of translating such changes into changes in numbers and kinds of personnel needed. The only rule seems to be that forecasting should be tackled systematically and analytically by the best people and methods available at the time. Some contributory factors in forecasting and estimating manpower demand are listed in Table No. 3 however, the bringing together of all these contributions in the process may not always be easy. Nevertheless, if they are incooperated in an established and effective planning activity then the probabilities of some success will be greatly enhanced.

### 3.8. THE SUPPLY SIDE OF THE MANPOWER PLANNING PROCESS

The supply side of the manpower planning process may be broken down conveniently into five aspects i.e. acquisition, conservation, utilization, development and wastage, each of which may operate singly or in various combinations in the determination of this side of the equation. (Wilson, 1981)

(a) Acquisition.

This is concerned with making up any shortfalls which cannot be met by growth and development of employees within the organisation. This consideration may raise such policy questions as the proportion to be developed rather than recruited, the extent to which vacancies should be publicised and the encouragement of internal transfers. In addition, the procedure of how to ensure the selection of the right people to avoid subsequent problems and wastage is also raised.

(b) Conservation.

The question here is how to retain the personnel once they have been acquired. This procedure may be related to personnel policies to include aspects such as reward structure, working conditions, fringe benefits and style of management of the organisation.

(c) Utilization.

The personnel who have been retained should have their performances stimulated in order for them to continue to perform and here the objectives of the organization through its structure and systems should encourage this. An effective appraisal system for improving performance and motivation should be in place.

(d) Wastage.

Some wastage is inevitable since people die, retire and become ill, while others may move to other avenues of employment. Obsolescence is another factor and there may be need for policies which will encourage those who will not learn new skills to retire early. Wastage can also be

a reflection of other deficiencies in employment practises.(Wilson 1981).

In conclusion, therefore both the demand and supply side of the manpower planning process can be sujested to statistical and analytical approaches, however the process is far from simple. It is, rather, a complex series of interactions among planners, technology and the enviroment.

These techniques identify and measure trends and relationships which have been established in the past and projected into the future on the assumption that these same trends and relationships will continue. However, due allowances must be made for changes which may break these established trends and relationships. These changes on the other hand may be influenced by technological changes, changes in the economic, social and political enviroment in which the organization operates, policy changes and objectives of the organization itself and so on.

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Table No.3 Manpower Planning Estimating Demand  
(Wilson 1981 )

Factors	Considerations
i) Groth, contraction, diversification, relocation, divestment, new technology, new products, new services-organisational changes.	Sources of information- corporate plan. What are implications. What gaps are there?
ii) Need for productivity increases-staff and hourly paid.	Does productivity need to be increased to regain/ maintain competitiveness? How much?
iii) Wastage rate.	Are too many people being lost and why?
iv) Salary/wage, fringe benefits, bonuses.	Can you attract and retain the people you need?
v) Age distribution.	Do you have bulges which will cause replacements or career development problems?
vi) Legislations.	If planning, What are the implications?
vii) Changing social norms and expectations.	Is there an intention to move towards shorter working week/year, dual jobs? What are the

Table 3 Cont.....

	implications.
viii) Style of management	Is it changing? Should it? What are the implications for control? More or less?
ix) Staff development.	What is the policy on Inter- nal development vs recruitment?
x) Unit size.	What is the policy? Should there be a move towards smaller units?
xi) Planning time frame.	What should it be? 1,5,10 years?

*(Source Willsons 1981.)*

The Sub Region therefore must realise that any future policies regarding our economy in general, the planners must also consider carefully about future policies regarding education and utilization of personnel for the Maritime Industry. Our developing countries should take some serious consideration of demands of the concept of manpower planning because of our scarce resources. This should be done , notwithstanding , some of the shortcomings and uncertainties inherent in its implementation. On the other hand, the consequences of not employing the concept should be weighed carefully against hindsight and the current experiences in the maritime industry.

Furthermore, the policies must respond as far as possible to the projected and specific needs of the industry as it changes and develop internally, and the environment in which it operates.

Developing countries like ours in the Sub Region which do not have along and established history and experience in maritime industry and more particularly in maritime education and training. Manpower planing, therefore, in maritime education can become a tool in assisting the rest of our economy which greatly depends on the maritime industry.

### 3.9. The Mannig of Ocean Going Vessels.

Information on the number of Seafarers serving in the 32 vessels totaling 237,416 GRT. as shown in table No.7 could not be compiled. The main reasons being lack of a centralized, upto date registers in the respective countries showing the exact number of officers and ratings presently serving on this ocean going fleet. The

following source have been consulted to obtain information in compiling this table: the Lloyed Register of shipping, passed W.M.U.students thesis coming from these countries and the present students attending this institution.

General speaking most of the ships today forming part of the Sub regional ocean going fleet are general cargo ships. Their age varying from 3years old to 22years old. Even the new ones still operate with the old scale of manning characteristics, that is to say less automations considering that labour is cheap in these countries compering to the developed world. Our discussion here on the manning of this ocean going fleet is going to be based on the asumption that in a general cargo ship the size of which is generally employed on this trade vary from the range of 7000GRT to 13,000 GRT. And as I have said earlier with no automations in these ships. The manning of these ships are as shown in the following table:

Table No.4. Average number of Crew of a Sub region Ocean Going Ship.

Master	1	Chief Engineer	1
Ch.Officer	1	2/Engineer	1
2/Officer	1	3/Engineer	1
3/Officer	1	4/Engineer	1
R/Officer	1	Electrition	1
Deck Cadet	1	Engineer Cadet	1
Deck rating	7	Eng/R/Rating	5
Catering	5		

Total Crew 29

When discussing the manning of the Sub region's Ocean going fleet, it should be borne in mind that the total number of seafarers given is the number presently at sea. The number of crew and officers required to operate the 32 vessels is higher. One has to make concessions for seafarers on leave, seafarers being sick and those undergoing further training. Taking 32 ships and multiplying this with 29 crew per ship the total crew actually serving will be 928. Based on these factors, 30% could be added to the number actually serving. This brings the number of seamen up from 928 to 1206.

The fleet is not completely manned by the Sub regional Nationals. Among the six Countries which own ocean going vessels, Ethiopia and Sudan are the only countries which are fully manned by the Nationals. Most of these foreigners are senior officers such as Chief Engineers and Captains. Therefore means to be taken to fill these positions will be discussed later in this thesis.

No accurate data exist to indicate the age of most of our seafarers, but it is not unrealistic to assume that the average age is somewhere between 35 and 45. This again reflects to when training was first started in the Sub region soon after the countries acquired Independence in the early sixties.

## MANPOWER APPRAISAL

### 3.10. Future Personnel Requirements.

The present number of vessels in the Sub region's fleet plus the number of seafarers manning these vessels has now been given. Even if the number of 32 vessels and



seafarers were to be frozen at this 1988 level, additional personnel would be required in the years to come to fill the vacancies caused by natural turn-over. The turn-over will be largely determined by the average length of sea service or in other words the number of years a seafarer spend at sea. Based on these factors, it is not unrealistic to state that the average sea service for the personnel presently serving in the Sub region's fleet is ten years. Ten years of sea service should correspond to a 10% annual turn-over, according to Capt. Erik Jacobsen's report on Tanzania Maritime Training.

Based on a 10% annual turn-over and the number of vessels and seafarers being frozen at the 1988 level, the following additional personnel would be required for the fleet each year.

Table no. 5. Number of crew on board Ocean Going ships in in the Sub region.

Masters	32	Ch/Eng.	32
Ch/Officer	32	2nd/Eng.	32
2nd/Officer	32	3rd/Eng	32
3rd/Officer	32	4th/Eng.	32
R/Officer	32	Electrition	32
Deck Rating	224	Engine Room Rating	160

As mentioned, these figures are based on the 1988 figures for vessels and seafarers. But the Sub rgon's fleet presently consisting of 32 vessels is hoped to grow in the future.

The future development or size and structure of this fleet to meet the UNTAD code of conduct of 40 40 20

arrangement for these countries will depend on a number of factors. The influence and force of these factors in the coming years are difficult to predict. However a few major factors can be outlined. These could be summed up as follows:

- .Need for domestic seaborne transport.
- .International trade patterns.
- .Import and export by sea.
- .National shipping policies of the Sub region states.
- .General economic situation in the Sub region.

These factors can be discussed in depth, but that is outside the scope of this paper. However, a case has been established to show that training needs do exist for the Sub region ocean going fleet especially that most of the countries in the Sub region are on the verge of farther expansion in their ocean going fleet to cope with demand of economic expansion. For example Kenya Government is in an advanced stage of starting its national shipping line with at least 3 vessels. Therefore if we consider the Sub regional fleet expansion say in the next 5 years with a modest expansion, the number of officers to be trained could be larger in this respect. The present number of vessels is 32 and it is assumed that this number will have increased by at least 15% by the year 1995. This will bring the number of vessels in the fleet to 37.

Number of Seafares to be trained allowing 10% turn-over

Deck Officers.	10% of 166 =	16
Engineering Officers.	10% of 208 =	21
Catering Staff.	10% of 208 =	21
Deck Ratings.	10% of 291 =	29
Engine Room Ratings.	10% of 208 =	21

Taking this into consideration, the following average number of personnel on each vessel could be applied.

Deck Officers	4
Engineering Officers	5
Catering Staff	5
Deck Ratings	7
Eng. Room Ratings	5

Based on the turn-over and fleet expansion, the following requirements could be indicated on a yearly basis until 1995.

Table No. 6 number of Ocean Going Seafarers to be trained annually.

<u>CATEGORY</u>	<u>NUMBER</u>
Deck Officers	14
Engine Officers	18
Catering Staff	18
Deck Ratings	24
Engine Ratings	18

Therefore the ocean going fleet standing today 1988, with 32 ships and allowing 15% expansion in the next 7 years to the year 1995, will need seafarers indicated in Table No 6. to be trained annually.

Table No. 7. Sub Region Ocean Going Fleet.

Country	Number of Ships	Gross Registered Tonnage
COMOROS.	-	-
DJIBOUTI.	-	-
ETHIOPIA.	9	60205
KENYA	-	-
MADAGASCAR	3	33120
MAURITIUS.	6	33858
MOZAMBIQUE	-	-
SEYCHELLES.	-	-
SOMALIA.	2	20000
SUDAN.	10	91101
TANZANIA.	2	19132

Table No. 8. Sub Region Coastal Fleet.

COMOROS	2	1200
DJIBOUTI	1	500
ETHIOPIA	3	3915
KENYA	3	2856
MADAGASCAR	97	39447
MAURITIUS	5	6000
MOZAMBIQUE	9	21626
SEYCHELLES	1	345
SOMALIA	4	3540
SUDAN	12	54277
TANZANIA	16	11312

*Source: Compiled from Lloyds List of ship owners, interview students of World Maritime University.*

### 3.11 The Manning of Coastal Fleet.

The Coastal fleet consists of 152 vessels totaling 147,974 GRT. Compared to the Ocean going fleet, although smaller in tonnage but employs a large number of seafarers. Table No.8 shows the distributio of the fleet in the Sub region. As for the Ocean going fleet, the same sources ware used to obtain the information.

Most of the ships forming part of the Sub regional Coastal fleet are general cargo ships with exceptional few tankers and passenger vessels. The Coastal fleet plays an important roll for the needs of domestic seaborne transport system and inter-regional Transport network. Even Countries like Tanzania which is not a wholly archipelagic state, still rerlies heavily on seaborne transportation to serve the mainland areas. The carrying of goods and passengers by ships is very important to the Tanzanian infra-structure. Areas not linked to or with insufficient links to the road systems rely on seaborne transport. No other adequate means of transport exist for the communities along the coast and away from the mainland.- Despite the fact that the Southern coastal regions have road links to the capital, the area can be cut off as these roads are impassable for large periods of time each year. This is only an example but there are similer cases in other parts of the sub region.

Coastal sea transport thus, constitutes the main means of haulings and transporting cargo and passengers to and from a number of countries in the Sub region. This transporting system is regarded as the feature means of expanding trade within the Sub region, especially now that PTA is fully operational. The volume of Inter-regional trade

is expanding day by day and to man this important fleet needs a greater consideration.

Maning of the Coastal fleet will also be based on assumptions. If we take an average Coastal vessels with say 16 crew in a form shown in the table below.

Table No.9. Average number of crew of a Sub region's Coasting ship.

Master	1	Ch. Engineer	1
Ch. Off.	1	2nd. Engineer	1
2nd. Off	1	3rd. Engineer	1
Deck Cadet	1	Eng. Cadet	1
Deck Ratings	3	Eng. Room Ratings	2
Catering Staff	3		
Total	16		

Since we know the present number of vessels in the Sub region, the number of seafarers to be trained can be found. Based on the assumption that all these figures are to be frozen at this stage 1988 level, the following will need to be trained:

Table No. 10. Coastal Fleet Seafarers to be trained annually without fleet expansion.

Deck Officers	10% of 593	= 59
Engineering Officers	10% of 593	= 59
Catering Staff	10% of 593	= 59
Deck Ratings	10% of 593	= 59
Engine R. ratings	10% of 395	= 40

Concession has been made on the actual figures for those on board to take care for seafarers on leave, seafarers being sick and those undergoing further training. Based on these factors, 30% has been added to the number actually serving. This will bring the number of seafarers up from 2128 to 2766. The Coastal fleet can be expected to expand considering the latest developments taking place in the Sub region, that is to say, the entering into force of the PTA. trade machinery. According to African Business of May 1988, a recent study conducted by the PTA. Secretariat has revealed that at least 400 products are now available in the Sub-region for intra-PTA trade. This will further accelerate the need of inter-state shipping activities.

Therefore the sub region may be lead into a rapid growth of shipping activities. In that case we can say an expansion of 25% of the present Coastal fleet. If this is the case then, the number of seafarers to be trained based on the turn-over and fleet expansion, the following requirements could be indicated on a yearly bases untill 1995. Based on the average of 2766 seafarers and 152 ships.

Table No.11. Coastal Fleet Seafarers to be Trained annually with Fleet expansion.

Category.	Number of crew to traine
Deck Officers	106
Engineering Officers	106
Catering Staff	106
Deck ratings	106
Engine Room Ratings	79

Allowing the Coastal fleet today 1988, of 152 vessels to

expand by 25% upto the year 1995, we will have a fleet of 190 ships and a number of seafarers to train as shown in Table No. 11.



### 3.12. The Manning of Inland Water Vessels.

#### 3.12.1 General

Inland Marine services in the Lakes and rivers around the Sub region started around the turn of the century. Although services on the White Nile in the Sudan started much earlier. Quoting an Eastern African Railways and Harbours news builetin of 1975, which said , "In 1899 a marine survey party under Commander B.Whitehouse,R.N. began a survey of the British portion of the lake Victoria in preparation for the ships which ware to use these waters". This was during the scrumble for Africa between the Germans, the British and the Belgians. At the end of the day we had British colonies, German colonies and Belgian colonies.

One of the earliest steamships operated on lake Victoria was the Kenya, which had been built at Glosgow in 1890 and shipped to Mombasa in packing cases none of which weiged more than 70lbs. the maximum which could be carried by one man.Kenya was eventually assembled and launched and for many years she plied between Kisumu in Kenya and Entebe in Uganda. During the First World war she became a man-of war, and finally a cargo tramp.(1)

By early 1906 the development of the lake traffic was strainig the capacity of the small fleet to the utmost. It was during this time that the fleet on the Lakes grew to what it is today. The same could be said for lakes Malawi, Tanganyika, Albert and River Zambezi.

The needs for maritime training for the Lake personnel

has been a concern since the starting of these services. During the colonial times, qualified officers were brought from overseas to man these ships. Training for the indigenous africans was non existence until 1957 when the first seamanship school was opened along the shores of Lake Victoria.(in KISUMU) This was mainly to teach African Seamanship skills as they called it, but not to enable them to man these ships as officers. Training for officers and other personells to man these ships really started in 1961 when young men were recruited after attaining Olevel standards and send to Britain to train as merchant Navy Officers.

The importance of lake services in the sub region has increased in the recent years. Several of the land locked countries depend heavily on water transport for their export and imports. The increasing tension in South Africa could also lead to a complete stop in the transfer of goods through this country, thus creating a bigger need for cargo corridors across the lakes to be established.

### 3.12.2 Sudan

Sudan although depends heavily on railway and road transport, a great part of its cargo transported to the Southern region is carried by the River Transport steamers. Even in the Northern part of the country between Karima and Dougola the River Transport has played a great role in transportation of passenger and cargoes. Sudan has about 4068Kms. of navigable rivers, with some 1723Kms. open all the year round. With the help of USA government, Sudan is in a process of further expansion of its river services.(according to thesis of Abubakr Sidahmed Ali -Sudan,1987) Sudan's river Transport Cooperation

owns a fleet of 380 vessels including new vessels recently purchased from the federal Republic of Germany and Netherlands.

### 3.12.3 Ethiopia

Inland water navigation in Ethiopia is on a small scale as river transport is possible for only three months in a year during the rainy season when there is sufficient depth of water. On the lakes navigation operates all the year round. The country's fleet consists of 6 passenger boats with a maximum capacity of 30 persons, 6 combined passenger and cargo boats with a capacity ranging from 20 persons and one tonne to 100 persons and 40 tonnes, and 3 general cargo boats with a capacity of two to 4 tonnes. (1).

### 3.12.4 Zambia

Zambia is endeavouring to develop its inland water transport industry, mainly to serve areas where roads become impassable during the rainy season.

### 3.12.5 Malawi

Most of the countries in the sub-region which operate lakes or river services realising the importance of water transport, are modernising their services. Malawi which has great plans to utilise lake services in their country for itself and other neighbouring countries in the sub region. Lake Malawi from which the country is named, runs from north of the country to the south of the country. This strategic position of the lake is not only going to help Malawi, but her neighbours as well, such as

Tanzania, Zambia, Mozambique and Zimbabwe. Malawi has gone a step ahead to start a Maritime Training School in Monkey bay. IMO, NORAD. and ILO. have recognised this school and are giving it every support for its succes.(6).

*(6) Source ILO report 11 On Inland Transport Committee eleventh Session, Geneva 1985.*

3.12.6 Manning of modern ships whether in a lake or in a sea, basically it should be the same. It is quite true to say that ships at sea undergo more severe conditions due to harsh elements that are normally exist at sea. But the fundamentals in handling, operating and navigating are all the same. If you want ships to be properly maintained and safely and efficiently operated whether at sea or in a lake, trained personnel will always be needed. In many cases maintenance, safety and operational procedures and routines are the same.

Therefore education and training of personnel that are to man these vessels should be equally the same as that of personnel manning ships at sea. In Table No. 9 as it shows, we have about 436 vessels of different types. It is quite true to say that most of these vessels are small as the tonnage of 33509GRT. indicates. But still they need to be manned by competent and well trained people.

Here again an assumption has to be made. Given the the present number of vessels and assuming that each vessel employs 10 crew members.

Table No.12 Total number of crew on Inland water Vessels.

Category.	No. of crew per Ship.	No. of Ships	Total No. of Crew.
Master.	1	436	436
CF. Officer	1	436	436
Ch.Eng.	1	436	436
2nd. Eng.	1	436	436
Catering Staf	1	436	436

Deck Ratings	3	436	1308
E.R.Ratings.	2	436	872
Total	10		4360

These figures are based on the 1988 level and no allowance has been made for crew on leave, crew being sick and those undergoing further training. If we say 30% could be added to the number actually serving, this will bring the number of crew from 4360 to 5668.

No accurate data exist to indicate the age of most of the personnel working in these Inland water services, but the author of this paper visited Kisumu port in Lake Victoria, he found that most of the personnel manning the Kenya and Uganda vessels were quite old. It won't be unrealistic to assume that the average age is somewhere between 40 and 50 years.

General speaking turn-overs in the Inland Water services in the Sub-region are quite high compared to the ones in the sea services. This is due to the following factors:

- a) Poor working conditions.
- b) Very unattractive salaries and remunerations.
- c) No proper training program and as a result it does not attract a lot of young school leavers, but the ones who join leave afterwards when some thing better turns up.
- c) Merchant marine officers who are prevented from pursuing their sea-going career are transferred to the Inland water service making conditions for others untolerable.
- d) Lack of chances of advancement.
- e) Lack of interest shown by the management because most

of the services are government owned and thus like any government organisation morals are low due to incentives and appreciation of the seniors.

As i have said earlier in this chapter, when training started for the Inland water services, officers were sent overseas for training. These officers were to remain abroad for their training and sea service. After sometimes overseas it became less attractive for them to return to the Inland waters especially after obtaining their first Certificate of Competence and start earning some money. Therefore to train people and retain them for all the Authorities in the sub-region has been a problem for a very long time. This is also a result of the poor performance of all the inland water service in the area. At the moment most of them are not manned by qualified persons. According to ILO report 11 on Inland Transport Committee, eleventh Session Geneva of 1985 states that: "The lack of skilled manpower is a serious handicap to the more efficient use of existing waterways, as is the inadequate equipment of port facilities. Apart from financial problems, it is the shortage of highly-skilled personnel that is the main obstacle, despite the excellent work carried out by a number of national and sub-regional establishments as regards the maritime training of semi-skilled personnel". Truly for a success of every enterprise personnel play an important part, highly-skilled personnel could mean a difference between success and failure of an organisation.

Since we know the present number of vessels in the sub-region's Inland water transport, the number of personnel required to be trained can be found. Based again on the assumption that all these figures are to be

frozen at this stage 1988 level the following will need to be trained. (assuming this time 15% turn-over for officers and 10% turn-overs for other personnels.)

Table No.13 Total number of crew to be trained in Inland Water Fleet without Fleet expansion annually.

Deck Officers	15%	of 872	=	130
Engineering Officers	15%	of 872	=	130
Cattering Staff	10%	of 436	=	43
Deck Ratings	10%	of 1308	=	130
Engine R. Ratings	10%	of 872	=	87

The above figures are based on the present level of the fleet, but should the fleet expand say by 10% in the next 7 years to the year 1995, a further additional personnel will need to be trained.

Based on the turn-over and fleet expansion, the following requirements could be indicated on a yearly basis until 1995.

Table No.14. Total crew per Category to train with turn-over and Fleet expansion.

CATEGORY	NUMBER
Deck Officers	142
Engineering Officers	142
Catering Staff	49
Deck Ratings	148
Engine R. Rating	142

In the STCW. it is required that vessels over 200GRT.,



ratings forming part of a navigational watch on a sea-going ship must be properly trained, in this paper training for ratings has been taken on a more general size of vessels. This is so for specially the Inland Water vessels some of which are about 50GRT.

### 3.13. The Needs of Port Movement Services.

This category of port personnel includes such occupations as Marine Pilots, Tug Masters, Marine Engineers And others who man Harbour crafts and Launches.

Most of the Tug Masters/Tug Engineers in the past have been trained, "on-the-job" for a very long time. Some of these Tug Masters/Tug Engineers are very good tug handlers and tug engineers but have no basic fundamentals on the tugs that they are operating. These vessels have become bigger and more sophisticated in most of the Ports in the Sub-region. In some of the bigger ports like Mombasa and Dar es Salaam some of these tugs are over 4000kW. power with a balard pull of 50 tonnes. The majority of the staff who man these vessels have received no real structured training. They have acquired their skill and knowledge soley through experience, that is to say "on-the-job" training. In today's world with its high technology and increased hazards, it is vital that knowledge and experience gained "on-the-job" is complemented by a properly organised and structured programme of "off-the-job" learning, in a training school linked to or part of, the industry. This will ensure that personnel are effective and efficient in their work, and that they will also operate with a high degree of understanding and safety. This

TABLE NO. 15 TUGMASTERS TO BE TRAINED ANNUALLY IN THE SUB REGION.

COUNTRY	1984	1985	1986	1987	1988
COMOROS	1	1	2	1	1
DJIBOUTI	5	5	5	5	1
ETHIOPIA	-	-	-	-	-
KENYA	6	5	5	6	6
MALAGASY	-	-	-	-	-
MAURITIUS	1	1	-	-	-
MOZAMBIQUE	-	-	-	-	-
SEYCHELLES	1	1	-	-	-
SOMALIA	-	-	-	-	-
SUDAN	6	6	6	6	6
TANZANIA	3	3	3	3	3
TOTAL PER YEAR	23	31	21	20	15

TOTAL FOR THE PERIOD 1984-88 110

is essential in our ports today in the sub-region some of which are buisy and handles a lot of variable size and type of ships. This could be Tankers, RoRo vessels and other large and okward ships.

Most Of the management in the sub-region have identified this problem but solution has not been an easy one. Training is expensive especially for these very small population of personnels. Some measures have been taken in kenya to recruite Tug Master/Tug Engineers who have had some qualifications. In otherwords seafarers who have had some sea experience and aquired some basick

knowledge. But this has not been easy because of salaries ashore are less than those at sea.

According to a joint report of ECA/PMAESA of October 1983, it gave an indication of how many Tug Masters will need to be trained from 1984-1988. See Table No.15. It won't be unrealistic to say that none of these targets have been reached by any of the states in the sub-region.

#### 3.14. Marine Pilots Training.

Marine pilot training in the sub-region has been that normally followed by other merchant Navy officers until attaining either Class 2 or Class 1 F.G. Certificates of Competency. Then they undergo local training for channel familiarization and port regulations before are allowed to pilot ships on their own. Table No. 16 and 17 Shows an ECA/PMAESA report on training needs for Ports of Eastern & Southern African on the Training needs of Marine Pilots/Marine Engineers between the year 1984-1988. It shows a total of 81 Pilots and 95 Marine Engineers to be trained by the countries in the sub-region.

Table No. 17 Marine Engineers to Trainee.

COUNTRY	1984	1985	1986	1987	1988
COMOROS	1	1	1	1	1
DJIBOUTI	1	1	1	-	-
ETHIOPIA					
KENYA	9	7	6	5	-
MALAGASY	-	-	-	-	-
MAURITIUS	-	-	-	-	-
MAZAMBIQUE	-	-	-	-	-
SEYCHELLES	1	1	-	-	-
SOMALIA	-		1	1	1
SUDAN	6	6	6	6	6
TANZANIA	4	4	4	4	4
TOTAL PER YEAR	22	20	19	17	17
TOTAL FOR THE PERIOD 1984-88			95		

*Source: Joint ECA/PMAESA Report on Training needs and Facilities for Ports of Eastern and Southern Africa.*

TABLE NO. 16 HARBOUR PILOTS TO TRAIN

COUNTRY	1984	1985	1986	1987	1988
COMOROS	2	2	2	2	-
DJIBOUTI	-	-	-	-	-
ETHIOPIA	2	2	-	-	-
KENYA	3	3	3	3	3
MALAGASY	3	3	3	3	3
MAURITIUS	-	-	-	-	-
MOZAMBIQUE	-	-	-	-	-
SEYCHELLES	2	2	2	-	-
SOMALIA	1	1	1	1	1
SUDAN	2	2	2	2	2
TANZANIA	2	4	4	4	4
TOTAL PER YEAR	17	19	17	15	13

TOTAL FOR THE  
PERIOD 1984-88

81

*Source Joint ECA/PMAESA Report on Training needs and Facilities for Ports of Eastern and Southern Africa (Oct. 1983.)*

Having being given these figures, it won't be unwise to alter the dates 84 for 88 and project the same figures for the next 7 years from now. This is true because the same figures can be applicable now knowing very well that none of the countries in the subregion have carried out the training as was suggested by the ECA/PMAESA report of 1983.

## CHAPTER FOUR

### The Benefits of Establishing a Regional Maritime Training Institution in the Sub region.

#### 4.0 Introduction.

In this chapter we are going to discuss the benefits that the Sub region will get by the establishment of this Institution. Three aspects of benefit are going to be looked into. One, the cost benefit, two, Regional benefits in terms of advancement in Maritime Education and Training, and the impact that it will have on our Regional system of Maritime Education and thus the transfer of Technology. Three, the psychological benefits of studying within their own environment.

#### 4.1 Maritime ducation as any other Educational Establishment

Maritime education and training should be looked upon in a manner similar to any other education which is required today in the commercial world of shipping. And therefore an industry like any other industry e.g. Agriculture, Tourisim or Mining. It is true to say that shipping is more International in nature than agriculture but both are complex in their own ways. Most of the countries in the sub region established universities soon after acquiring independence in early 60s. These universities offer degrees in a wide range of faculties e.g. Medicine, Agriculture, Engineering etc. In Kenya there are higher Institutions of learning in Hotel Management, Forestry, Agriculture, and Engineering among others. One might wonder why the Kenya Authority thought that there was a need

for establishing an Institution to teach all these disciplines.

In Kenya when it became evident that Tourism was going to be one of the major Industries in the country, the Authority thought that there was a need for the establishment of this Institution. It was realised that the cost of sending students abroad was prohibitive and that it could be done cheaper at home. The institution has grown since its inception in the early seventies and serves not only Kenya but her neighbours as well. The same could be true for a maritime training Institution. On this occasion however not for one country only, as this will not be economical viable, but for the whole region, - bearing in mind that shipping is complex, expensive and highly competitive and International in nature. Also the number of students that needs to be trained in each individual country is very small.

#### 4.2 Cost Benefit

Apart from Tanzania, Mozambique and Madagascar the rest of the countries in the Sub region send all their students overseas for all the Maritime education courses that are required in their countries. The other three countries have established Maritime training Institution offering basic Maritime Training and Education qualifications. (see chapter two). Generally the Sub region has been sending its students mainly to England, Egypt, France, West Germany and some Eastern European countries. Apart from U.K. and Egypt, training of students in the other countries was done through fellowships. In the recent past, the U.K. has also increased her training costs so much that training of personnel can only be done



through fellowships. Training for our manpower needs through fellowships is unrealistic and never under the control of the country concerned. As a result of high costs both in Egypt and U.K. training has lagged behind.

#### 4.3. Cost and Complexity of MET Education in U.K.

In U.K. today a student wishing to obtain a class 3 Certificate of Competency under the new scheme must follow a B.Tech. approved course. (either HND Nautical Science or an appropriate Certificate of Achievement course). Each of these courses consists of a combination of B. TEC. Units of study, the student's performance in each unit being assessed by the College by means of phase tests, assignments and, in the case of some units, a formal end of unit examination. The system is complex consisting of 172 weeks in the class room and 22 months approximately at sea. In addition, to obtain the class 3 Certificate of Competency, a student will have to pass a formal written examination, set and marked by SCOTVEC. on behalf of the D.Tp., and satisfy the requirements of an oral examination conducted by D.Tp. (3)

The cost of this complex system per student is as follows.

Registration, tuition and examination	Us. Dollar	11,335
Accommodation Charges	Us. Dollars	15,803
Transport Charges to and from	Us. Dollars	1,225
Total		28,363

*(Source Southampton Institute of Higher Education, the College of Maritime Studies - WARSASH.PRC/NFB/X.C.1988 )*

#### 4.4 Cost of studying for Certificates of Competency in Egypt.

In Egypt the system is less complicated consisting of a 2 year long course for Class 3 Deck officer and 2Years 6 months long course for Class 3 Marine Engineer Certificate of Competency. This is followed by 12 months sea service for Deck Officer and 6 months for Engineer Officer.

The cost of sending one student to Alexandria to study for a Class 3 Deck and Class 3 Marine Engineer is as follows:

Board and tuition fee Deck	U.S.Dollars	10,800
Board and tuition fee Marine Eng.	U.S.Dollars	12,050
Travel expenses (return)	U.S.Dollars	1,000
One Deck Officer will cost	U.S.Dollars	11,800
One Eng. Officer will cost	U.S.Dollars	13,000

Therefore if we compare the two options Egypt is the cheaper.

#### 4.5 General Analysis on Cost of MET Education in the Sub region

Chapter three has identified the personnel which need to be trained on an annual basis. Taking this into consideration and assuming that every body including those personnel in Tanzania, Madagascar, and Mozambique where training institutions already exist for training lower classes, are to be trained overseas. The following are the personnel in each section:

Table No. 18 Annual Training Needs of the Sub regions  
Seafarers and Port Movement Services.

	Deck	Engine
Ocean going Fleet	17	24
Coastal Fleet	106	106
Lakes Service Fleet	142	142
Port Movement personnel	17	22
Total	282	294

Nevertheless the main concern at this moment is to train only class 3 deck and Engineer Officers. Therefore if we say that 70% of the total are to be trained in every section, (assuming 70% are Class 3, 20% are class 2, and 5% are Class 1). In this case the following Class 3 Deck and Engine personnel

will need to be trained:

70% of 282 = 200 deck Officers.

70% of 294 = 205 engineer Officers.

It can be said that totally trained 200 Deck Officers and 205 Engineer Officers will cost the Sub region the following annually:

Deck Officers	200 x 11,800	=U.S.Dollars 2,360,000
Eng. Officers	205 x 13,000	=U.S.Dollars 2,665,000
TOTAL		=U.S.Dollars 5,025,000

According to a report on training for Tanzania Merchant Marine Service by Captain T. Harris 1985., he estimated the cost of building and furnishing a new school in Tan-

zania to be U.S.Dollars 1.2m. This school was to teach 35 Deck students and 35 Engineering students. Also according to a brochure published by Bandari College in Mombasa, Kenya ,KPA spent a total of 2.5 million U.S.Dollars in 1980 to put up an ultra modern complex (Please see Appendix 3.). It has been established now that the total number of students in the Sub region is nearly six times that which were to be trained originally in Tanzania. Proportioning the cost of the building without taking inflation into consideration this will put the cost of a new building to (6x 1,180,550) approx. U.S.Dollars 7.1m. It is true to say that this figure does not include the cost of equipment such as marine plant and navigational teaching aids such as radars, and computers etc. From the same report of 1985 equipment in the first year will be about U.S. Dollars 80,000, second year 47,000, third year 20,000 and U.S.Dollars 5,000 for the 4th and 5th year.

It was also established in the Tanzania report that the annual budget of U.S. Dollars 421,052 will be needed to run this school. Proportioning this by 6 times will give us U.S. Dollars 2.5m. approximately.

New Building and Furniture	7083300
Average equipments over 5 years	31400
Annual running costs	2526312
<b>TOTAL</b>	<b>9,641,012</b>

The annual running costs also include expatriate salaries and expenses.

It must not be forgotten that with little extra costs, the same facilities could be used for teaching of lower class certificates, upgrading of other certificates and

teaching of ratings for the host country.

#### 4.6 Transfer of Technology.

A reliance on foreign educators or tuition from outside the sub region has been going on for years. We can say that until presently, very little progress has been made both in Maritime education system and teaching staff in this field. As mentioned earlier technology in the industry is changing very fast, and if the sub region needs to be abreast with time in the shipping industry, it needs not only personnel to man ships and ports but also the personnel to do the teaching within the sub region so that they can interpret trends and operations needs that will suite our local demands. A lot of other third World countries with a reasonable maritime transport infrastructure e.g. Phillipines, Brazil and Mexico have been training their personnel for years. There is no doubt in my mind that the success of any industry lies within its institutes of learning. It is through these that reaserch, studies and interpratation of world trends are conducted. The main function of World Maritime University is the training of specialized maritime personnel , including Lecturers and Examiners . The ultimate aim of these lecturers and examiners after completion of their studies is to return to their respective countries and teach in Maritime Training Institutions.

Transfer of technology in maritime Education and Training to the sub region will ensure that qualifications of shipboard personnel are mantained at the highest level. This is a crucial element in ensuring that maritime safety and pollution prevention standards are maintained. Investigations into shipping casualties have shown that

an extremely high percentage of their causes have to be attributed to human failure and in particular to failure resulting from lack of qualifications. This dangerous and threatening situation will continue to exist until all countries are in a position to make provision for education and training of highly qualified maritime personnel. Ideally it would be appropriate for every country to have its own institution but considering the size of the fleet in the sub region and the scarcity of resources, it would be only proper and economically viable at the moment to have one Maritime Training Institution with the cooperation of all the countries in the sub region.

Availability of locally trained lecturers and examiners for maritime education and training will enhance the regional capability in teaching and setting examinations, the result of which, will be the final elimination and dependence on expatriates both as teachers and examiners. A Regional maritime training institution will strengthen and help technical cooperation among the sub regional countries. Once the regional training and examinations capabilities have been well established, foreign currency expenditures will be eliminated.

#### 4.7 Psychological Benefits.

When the author of this paper first started his career in early seventies, young cadets were recruited from high schools having completed their secondary education and sent abroad, mainly to the U.K. The feeling of being abroad in a new environment, different people, culture and climate was quite an extra ordinary feeling. For an 18/19 years old individual to start studying abroad at this

early age was difficult. It would be more favourable for such youngsters to pursue their studies in a familiar environment with familiar customs without first having the dramatic experience of adaptability to a new way of life in a foreign country.

## CHAPTER FIVE

### 5.0 Summary and General Conclusions.

1. There is undoubtedly a great need for a special maritime training Institution in the sub region. Both the present and future size and structure of the fleet justifies such a suggestion. International conventions and requirements will also put a strong obligation on maritime nations to have properly trained and qualified seafarers manning the ships of these nations in the future. This applies to both officers and ratings. The obvious advantages of having properly trained personnel should be stressed in this connection. Ships operated safely and efficiently could conserve national resources and greatly improve the transportation system of the sub region.

2. The Sub region has rich seafaring traditions both along its coast and on the lakes and rivers, but like many other developing nations, being a latecomer into the world of modern shipping and operation of sophisticated ships, it has a special need for trained seafarers to bridge the gap between the past and the future.

The need for training of both officers and ratings of the sub region's fleets have been documented in this thesis(Refer to Chapter 3.). By having a training institution within the Sub region some of the problems involved in creating a maritime industry and the burden of utilizing scarce foreign exchange could be alleviated.

3. The size and flexibility of this institution in the sub region will be of great importance to the future development of maritime awareness and thus meaningful



maritime transport infrastructure. Talking of flexibility, some points should be mentioned once the institution has been established.

4. The records show that many regional institutions that were established in the past have failed in the third world countries. Lessons have been learned and the same mistakes should never be repeated. In most of the cases reasons have been political, ideological and in rare cases economical.

5. The sub region's size, population, and present inter-regional trade and internal trade calls for a systematic approach in its further developments. The Road and Rail transport network in the sub region is expanding gradually, but it is a known fact that water transport is the cheapest form of transport in the world. As the countries are geared to expand on these land modes of transport, great consideration should be given to look for ways and means of promoting maritime transport as well. The importance of maritime Industry as a whole in the sub region is considerable not only for the international trade but also for the interregional trade and especially now that there is an effective regional trade cooperation through PTA.

6. It is evident from the ports activities that the volume of trade has increased in spite of some isolated cases where adverse political and metrological forces in some countries have made their economy weak and thus disrupt their participation in both regional and international trade. The never ending wars and conflicts in southern Africa and the internal feuds in the Horn of Africa has drastically affected the sub region. The area relies hea-

vily on agriculture, apart from a few countries, for their export, and it is upon the proceeds of these that their future industrialisation and developments will depend. Commodity prices in the world markets have been low and frequent droughts have made the subregion sometimes dependent upon importation of food to supplement their own requirements. It is because of these arguments that every effort should be made not in the short term but in the long term to plan and shape our economy so that the little resources that are obtained are utilised to the maximum.

7. None of the countries in the sub region have come up with a clear policy in shipping. This has resulted in an ill-defined approach regarding training for our personnel in the maritime industry in general. A lot of effort in the past, by individual countries have been made financially and otherwise, to train nationals soon after independence, so that they could fill in vacant places left by the colonialists when they left over 25 years ago. It is not unrealistic to say that to find expatriates working in the Industry is still common in some places. Training of maritime personnel for all the sections of shipping industry has been haphazardly handled. In one country or even in one company people have been trained in about five different countries. As a result of this divisions have been created associated with where one has been trained. Groups of people who went to study in U.K., a group for those who went to W. Germany and so on. These divisions make working in harmony quite imposible sometimes, resulting in low productivity.

8. The International convention STCW.1978 has not been ratified by most of the countries in the sub region,

although Tanzania, Ethiopia and Mozambique have done so. This Convention could be taken as a bench mark when establishing guidelines and minimum standards for both seafarers and inland waters personnel. The general acceptance of the convention by the World maritime community at large is a strong indication of its value and usefulness and it has had many and varied influences on maritime education and training in both developed and developing countries.

9. As stated previously, much effort has been made in every country to start a Maritime training Institution. There has not been any coordination in these matters. Chapter 4 has shown to some extent the financial implications that are involved in these institutions. Malawi is in advanced stages of starting a maritime training school in Monkey bay for her lake services personnel according to ILO report on inland Waterway report 1986. Every country when it starts one, hopes to make it a regional institution, but no effort is being made towards that goal. IMO in her obligations to help member countries has always encouraged neighbouring countries to come up with a joint training arrangement in cooperation with one another and they will do their best to assist them. In this connection, IMO has no adequate resources of its own for this purpose, but the organisation is well placed to mobilise assistance from member countries who are willing and able to help.

One of the objectives of IMO by the establishment of WMLU is to educate lecturers of high standards so that they can participate actively in national or regional maritime training institutions (13)

*(13) Source WMLU course of study brochure March 1987.*

With reference to Chapter 3, we can conclude that there are about 282 Deck Officers and 294 Engineering Officers in the sub region who definitely need to be trained annually. This number is more than that of the U.K. cadets annual intake in the recent years. It is true that some of these are to be trained to Class 2 and Class 1 Standards, admittedly there are no prospects for that at the time being. Nevertheless Class 3 both deck and engine room officer which form the majority can presently be trained locally, if there is cooperation in utilising the present facilities that are existing at the moment.

The machinery for collecting this data has not been satisfactory, but the figures (282 deck officers and 294 Engineering Officers) should be used as a guide. There are no continuous monitoring and data collection that can help to assess the manpower supply and demand at the moment, however the figures will help to show the approximate number of seafarers employed in the sub region today. In some ports records for ratings only are kept when they are engaged on board new ships. Bearing in mind the figures shown above, it is evident that the authorities have to think even harder so that they are not caught unaware of their personnel needs. It must be remembered that a lot of the personnel employed to day as ship officers, Harbour Pilots, Harbour Engineers and others were trained in large numbers soon after independence. It is obvious that stringent measures are required to arrest chronic shortage that would result with the retirement of the present staff.

10. Chapter 3 has clearly shown the numbers that needs to be trained and also clearly analysed the manpower study approach and personnel Resource development approach.

Therefore there is a definite challenge to those managers involved in the Maritime Industry in general. The future development of maritime industry in the sub region may lead to a rapid growth of ports and shipping activities. This will without any doubt require an insight into the future so that there is a continuity in the utilization of properly trained personnel. Also bearing in mind that shore based personnel would be required at all level to cope with the different and varied maritime interests, consequently they should be adequately trained with the appropriate attitude, disposition and appreciation of the sub region's objectives. As it is the experience of most developed maritime nations, a substantial proportion of these shore based personnel are recruited from among those with a seagoing background.

11. Inland water services in the sub region have played a crucial role hand in hand with other modes of transportation since they were first started in 1896. Most of the countries in the sub region rely heavily on inland waterways for the transportation of their import and export, but the quality of personnel manning these services have been neglected and as a result their performance leaves much to be desired. To cope with rapid technological developments in inland waterways transportation the right manpower quality and quantity must not be overlooked. The habit of making inland waterways as a dumping ground of rejects or "deadwood" from the ocean going personnel should be discontinued.

The future development of ports in the sub region is bright. Plans to make Dar es Salaam's new container terminal fully operational by the end of this year, according to AED of July 1988, highlight what may well

become an increasingly competitive battle for business among sub region's leading ports. This will also add to yet the the already demand of expanding port facilities such as bigger and more sofiscated tugs. The manning of these and the piloting of the increased traffic is going to need more pilots, Tug Masters and Engineers. Therefore moving at this pace will certainly make shortages of skilled manpower the most impending factor. In table No.18 page No.68 showing the number of Port movement personnel can clearly show the emidiate needs of training in the sub region. Training is a continuous process and should be so structured as to accomodate new comers and at the same time allow for the old to retire in time.

## *RECOMMENDATIONS.*

The International Convention on Standards of Training Certification and Watchkeeping for Seafarers (STCW) 1978. can be viewed as a compromise by member governments of the International Maritime Organisation towards the establishment of guidelines and minimum standards for the technical education and training of seafarers. The general acceptance of the Convention by the World Maritime community at large is a strong indication of its value and usefulness and it has had many and varied influences on Maritime Education and Training in both developed and developing countries.

1. Most of the countries in the Sub region apart from the three mentioned in part one of Chapter Two have not as yet ratified this Convention. I therefore strongly recommend that the Sub region should within their administrative organisation look into, very carefully the prospects of ratifying this Convention. Before doing so they should come up with a clear and constructive shipping policy that will recognise the long term implications. In this respect the policy should, among other important factors, consider the items mentioned in the 1986 UNCTAD Report (14) which states as follows:

(a). The large and continuing imbalance between the demand for, and supply of, tonnage (now affecting practically all sectors of world shipping) is unlikely to be overcome unless world shipbuilding capacity is brought into closer relationship with projected requirements for tonnage.

(b). Subsidised excess shipbuilding capacity is probably

the major obstacle to a return to a more balanced situation in world shipping. Given the existing oversupply of tonnage - now still at about 25 percent of the existing merchant fleet - it cannot be realistically expected that a demand will develop during the foreseeable future, as excess shipbuilding capacity on a world-wide basis was estimated to be in 1986 still about 40 percent.

(c). In addition, most authoritative market forecasters now agree that world international trade, and hence the requirement for tonnage, will not increase substantially in the foreseeable future.

(d). The prolonged situation of subsidised over-capacity and instability in world shipping markets has been a major setback for the long-term planning of merchant fleet development in developing countries. Monopolistic practices which restrict access to cargoes in certain trades continue to be an important factor inhibiting participation by developing countries in bulk shipping.

2. In consideration of the above, the Maritime Training Policy should be formulated accordingly. In the establishment of this policy a primary consideration which - should be borne in mind is that in the Maritime Industry today, trainees are not trained for the Shipping Industry only but for a wider field of employment. There are many Maritime Industries such as Commercial Fisheries, Off-shore engineering etc.

*(14) Source Major issues in world shipping (A) Merchant fleet development. Report by UNCTAD Secretariat -TB/E/C/4/301 Aug. 1986.*



Maritime Education and training today involves practical "Hands-on" training. This often involves expensive equipment. Therefore the source or sources of funds must be a major consideration when thinking of establishing one. It is important therefore that the Sub region, when providing these Training facilities must give careful consideration to the framework within which these programs are to be developed. In this respect I recommend that the facilities should bear in mind the Sub regions financial position and one country with an already established training centre and infrastructure to open doors to other neighbouring countries. At the same time the host country should seek bilateral funding through IMO, UNDP or any other willing donor.

3. Many of the older Maritime Countries have had established maritime education programs along with other technical disciplines, within their education system some time ago. Britain was the only country to have done so recently. During my two years of studies at the WMU, and during my field studies in Western and Eastern Europe, U.S.A and Canada it became obvious to me that in most of these countries maritime education programs have been integrated within their National Education system. This is a result of the ever rapid and dramatic changes that are taking place onboard and with the ever changing technology in the Maritime Industry in general. Therefore I recommend that the Sub region should integrate the National system of General Education with Maritime Education and Training and also the Facilities to provide Maritime Training and Education at the same level as other higher education Institutions in the Sub region.

#### 4. Proposal for a Procedure Towards Maritime Education and Training in the Sub region.

As I have stated earlier in Part 1 of Chapter 2 that there is no maritime training system leave alone between country to country but also within the same country. Therefore I recommend that the Sub region to utilize the STCW 1978 as an acceptable and functioning vehicle to establish its own education and training system. In this Convention there is enough flexibility built into it that is applicable for both National and International requirements. It does not dictate absolute details on such issues as academic entry qualifications, number and structure of examinations and Certificates of competency and institutional training period. It and does not indicate any serious constraints that might put any country into problems once it decide to put it into effect. Therefore the first step after the formulating of a shipping Policy is to ratify the STCW 1978. Convention.

Having done so the countries in the Sub region should as a matter of prime necessity look into a forum so that there could be discussions and agreements at the highest Administrative and Political levels so as to ensure the coordination and harmonisation in all matters for establishing cooperation in the aforesaid Maritime Training Facilities.

5. A regional approach to Maritime Education and Training is a concept which seems to deserve most serious consideration by the states in the Sub region. This is not something new in the Sub region. During the Colonial days Mombasa Institute of Muslim Education was a Regional Maritime Training School. It came into being on the 22nd. of June 1948, according to the Institute's prospectus of

1948. The Board of Governors of this Institution came from Kenya, Zanzibar, Tanganyika (Now united Republic of Tanzania) and Uganda. The Institute was the only one in the region at that time that offered Nautical Education.

The object of the Nautical school within the Institute was to teach those students from all over East African who felt the need of having maritime trade as a profession. These students on leaving the Institute had to complete the necessary sea time before they were able to sit for any of the examinations for Merchant Navy Officers Certificates offered by Department of Trade in the U.K. 5 years later the school was closed for unknown reasons. (15)

6. The present condition as discussed in Chapter II, III and IV and the structure of today's shipping industry makes this concept even more relevant especially because of the small demand in each individual country and the high cost of sending students overseas.

As Independent developing states with shipping interests and ambitions, the Sub region would probably like to strive towards providing the highest level of maritime personnel for its industry and may even consider providing the necessary facilities for training, examination and certification.

With regard to a certificate of competency structure for these groups of personnel referred to in Chapter III, Ocean Going, Coastal Services and Inlandwater Services, guidance can be gathered from the STCW 1978. As I have said earlier this convention is flexible, and should only be taken as guideline in the concept to structure the

education system. When that has been done a syllabus should be drawn up taking into account that the education that these facilities will provide will cover a wider field of Maritime Industry and also the trainees today will remain hopefully in the Industry for say another 40 years to come. I believe when preparing seafarers or other personnel in the Maritime Industry today whether Engineers or Nautical officers, a wide fundamental knowledge needs to be imparted to the student so that he/she can cope with modern trends in the Shipping Industry. In my view a full time 2 years of studies for Nautical studies and 2 years 6months for Marine Engineers should be structured. These studies should be integrated with the rest of the National Education of the Sub region as I have said earlier. Within these periods at school a guided sea training of 3 months duration should be offered in a school training vessel. The syllabus stipulated in the STCW 1978, Convention for Nautical Studies in this case is not enough and additional subjects involving the Commercial aspects of the Shipping Industry such as Economics, Marketing, Maritime Law, Management, Finance and other maritime related subjects should be covered to a certain depth.

Once the students have been so instructed, an examination should be conducted at the end of the 2 years in all these subjects to ensure that all the information has been passed over. In addition that the requirements of the Administration have been reached regarding the safety of the ship and the protection of the marine environment. Then a student is awarded a diploma in Applied Science (Nautical studies) With the Marine Engineers also relevant subjects should be included in their syllabus such as Offshore Engineering, Principal of Management, Maritime

Law, Marine Material Science and so on. After 2 years and 6 months of studies and passing an examination, Marine engineers will be awarded a Diploma in Marine Engineering. With these qualifications and if they meet the Administration requirements regarding medical fitness particularly regarding eye sight and hearing, then the candidate can seek sea employment or work ashore in other maritime related industries. The ones going to sea on completion of the required sea time as stipulated in the STCW 1978, he/she is then awarded his first Certificate of Competency after passing an Oral examination.

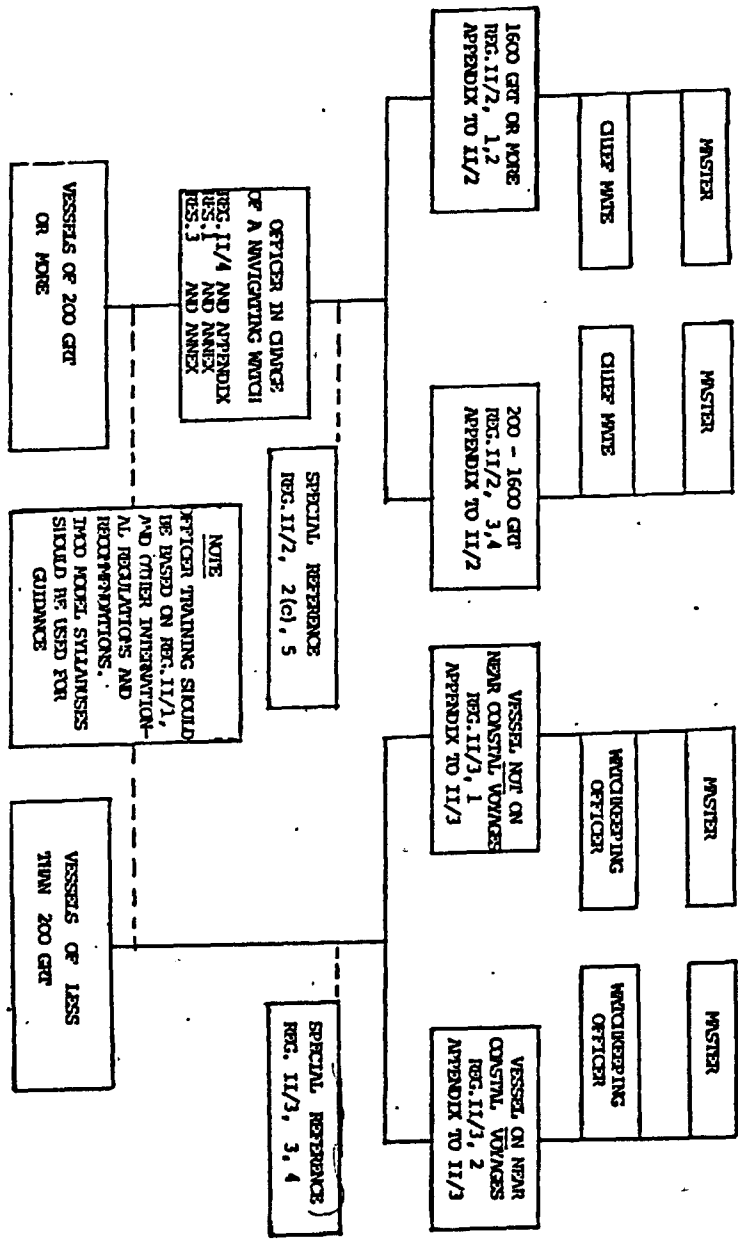
Here the experience criteria will determine his/her qualifications as an officer in charge of a navigational watch (Nautical) or Officer in charge in Engine room for Marine engineers. These certificates will be awarded depending on what type of vessel/trade he/she has served during his/her sea time. Whether it is an Ocean Going trade, in which case he/she will get a Foreign-going Certificate or a Coastal Service in which case he/she will be awarded a Coastal Certificate, or Inland waterways in which case an Inland waterways Certificate. All the written and oral examinations should be conducted by the Maritime training Institution under agreed regulations between the Administrations and the Institution. The emphasis on the oral examination should relate to the safety of the ship, protection of the marine environment and matters related to the Certificate he/she is being issued with.

The foresid Diploma should at this level cover upto a certificate of Competency as Class II deck and Class II Marine Engineer. For Class I training will still be sought overseas until such time that facilities, exper-

tise and demands warrant its establishment locally. In this respect then a student should do a further studies of 2 years and be awarded a Degree.

7. I will also like to recomend further that the Sub region should purchase a Trading training vessel which could be used for training purposes as well as forming part of a National Shipping line. The vessel should not be owned by all the countries in the sub region but preferably owned by a country with a well established National shipping Line. The ship should have a capacity of accomodating at least half class of each Engineering students and half nautical students at one particular time. The rationale of having a trading training vessel is that the students would have first hand practical application of what they have learnt in the class room. It can also be argued that in the long term and especially indeveloping countries with limited resourcess, purchasing a training vessel for the sole purpose of training only is expensive and even developing countries with a lot of resources are abodening the idea. Countries such as Mexico, Philipines, south Korea, and Egypt are running successfully trading trainig vessel. It is true to say that it is preferablly that the trading training vessel should be run by a National shipping Line.

DECK OFFICER TRAINING AND CERTIFICATION AS REQUIRED BY IMO STCW 1978 CONVENTION



Source: STCW. 1978

Regulation II/2

*Mandatory Minimum Requirements for Certification  
of Masters and Chief Mates of Ships of  
200 Gross Register Tons or More*

**Master and chief mate of ships of 1 600 gross register tons or more**

1. Every master and chief mate of a sea-going ship of 1 600 gross register tons or more shall hold an appropriate certificate.
2. Every candidate for certification shall:
  - (a) satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
  - (b) meet the requirements for certification as an officer in charge of a navigational watch on ships of 200 gross register tons or more and have approved sea-going service in that capacity:
    - (i) for certification as chief mate, not less than 18 months; however, this period may be reduced to not less than 12 months if the Administration requires special training which it considers to be equivalent to at least six months' service as officer in charge of a navigational watch;
    - (ii) for certification as master, not less than 36 months; however, this period may be reduced to not less than 24 months if not less than 12 months of such sea-going service has been served as chief mate, or if the Administration requires special training which it considers to be equivalent to such service;
  - (c) have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix to this Regulation, except that the Administration may vary these examination requirements for masters and chief mates of ships of limited size engaged on near-coastal voyages, as it considers necessary, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

**Master and chief mate of ships of between 200 and 1 600 gross register tons**

3. Every master and chief mate of a sea-going ship of between 200 and 1 600 gross register tons shall hold an appropriate certificate.
4. Every candidate for certification shall:
  - (a) satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
  - (b)
    - (i) for certification as chief mate, meet the requirements of an officer in charge of a navigational watch on ships of 200 gross register tons or more;
    - (ii) for certification as master, meet the requirements of an officer in charge of a navigational watch on ships of 200 gross register tons or more and have approved sea-going service in that capacity of not less than 36 months; however, this period may



be reduced to not less than 24 months if not less than 12 months of such sea-going service has been served as chief mate, or if the Administration requires special training which it considers to be equivalent to such service;

- (c) have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix, except that the Administration may vary these examination requirements for masters and chief mates of ships engaged on near-coastal voyages, as it considers appropriate, to exclude such material as is not applicable to the waters or ships concerned, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

#### General

5. The level of knowledge required under the different headings of the Appendix may be varied according to whether the certificate is being issued at master or chief mate level, and according to whether the certificate or certificates is applicable to ships of 1 600 gross register tons or more, or to ships of between 200 and 1 600 gross register tons.

#### APPENDIX TO REGULATION II/2

##### Minimum knowledge required for certification of masters and chief mates of ships of 200 gross register tons or more

1. The syllabus given below is compiled for examination of candidates for certification as master or chief mate of ships of 200 gross register tons or more. It is intended to expand and extend in depth the subjects contained in Regulation II/4 - "Mandatory Minimum Requirements for Certification of Officers in Charge of a Navigational Watch on Ships of 200 Gross Register Tons or More" Bearing in mind that a master has ultimate responsibility for the safety of the ship, its passengers, crew and cargo, and that a chief mate shall be in a position to assume that responsibility at any time, examination in these subjects shall be designed to test their ability to assimilate all available information that affects the safety of the ship.

#### 2. *Navigation and position determination*

- (a) Voyage planning and navigation for all conditions:
  - (i) by acceptable methods of plotting ocean tracks;
  - (ii) within restricted waters;
  - (iii) in ice;
  - (iv) in restricted visibility;
  - (v) in traffic separation schemes;
  - (vi) in areas of extensive tidal effects.
- (b) Position determination:
  - (i) by celestial observations, including the use of sun, stars, moon and planets;

- (ii) by terrestrial observations, including the ability to use bearings from landmarks and aids to navigation such as lighthouses, beacons and buoys in conjunction with appropriate charts, notices to mariners and other publications to assess the accuracy of the resulting position fix;
- (iii) using all modern ship electronic navigational aids to the satisfaction of the Administration, with specific knowledge of their operating principles, limitations, sources of error, detection of misrepresentation of information and methods of correction to obtain accurate position fixing.

3. *Watchkeeping*

- (a) Demonstrate thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea, including those Annexes concerned with safe navigation.
- (b) Demonstrate knowledge of Regulation II/1 - "Basic Principles to be Observed in Keeping a Navigational Watch".

4. *Radar equipment*

Demonstrate in conjunction with the use of radar simulator or, when not available, manoeuvring board, knowledge of the fundamentals of radar and ability in the operation and use of radar, and in the interpretation and analysis of information obtained from this equipment, including:

- (a) factors affecting performance and accuracy;
- (b) setting up and maintaining displays;
- (c) detection of misrepresentation of information, false echoes, sea return, etc;
- (d) range and bearing;
- (e) identification of critical echoes;
- (f) course and speed of other ships;
- (g) time and distance of closest approach of crossing, meeting or overtaking ships;
- (h) detecting course and speed changes of other ships;
- (i) effect of changes in own ship's course or speed or both;
- (j) application of the International Regulations for Preventing Collisions at Sea.

5. *Compasses - magnetic and gyro*

Ability to determine and correct the errors of the magnetic and gyro-compasses and knowledge of the means for correcting such errors.

6. *Meteorology and oceanography*

- (a) Demonstrate the ability to understand and interpret a synoptic chart and to forecast area weather, taking into account local weather conditions.

(b) Knowledge of the characteristics of various weather systems, including tropical revolving storms and avoidance of storm centres and the dangerous quadrants.

(c) Knowledge of ocean current systems.

(d) Ability to use all appropriate navigational publications on tides and currents, including those in the English language.

(e) Ability to calculate tidal conditions.

7. *Ship manoeuvring and handling*

Manoeuvring and handling of a ship in all conditions, including the following:

(a) manoeuvres when approaching pilot vessels or stations with due regard to weather, tide, headreach and stopping distances;

(b) handling a ship in rivers, estuaries, etc., having regard to the effects of current, wind and restricted water on the response to the helm;

(c) manoeuvring in shallow water, including the reduction in keel clearance due to the effect of squat<sup>1</sup>, rolling and pitching;

(d) interaction between passing ships and between own ship and nearby banks (canal effect);

(e) berthing and unberthing under various conditions of wind and tide with and without tugs;

(f) choice of anchorage; anchoring with one or two anchors in limited anchorages and factors involved in determining the length of anchor cable to be used;

(g) dragging; clearing fouled anchors;

(h) dry-docking, both with and without damage;

(i) management and handling of ships in heavy weather, including assisting a ship or aircraft in distress, towing operations, means of keeping an unmanageable ship out of a sea trough, lessening drift and use of oil;

(j) precautions in manoeuvring for launching boats or liferafts in bad weather;

(k) methods of taking on board survivors from lifeboats or liferafts;

(l) ability to determine the manoeuvring and engine characteristics of major types of ships with special reference to stopping distances and turning circles at various draughts and speeds;

(m) the importance of navigating at reduced speed to avoid damage caused by own ship's bow or stern wave;

(n) practical measures to be taken when navigating in ice or conditions of ice accumulation on board;

(o) the use of, and manoeuvring in, traffic separation schemes.

<sup>1</sup> Squat: the decrease in clearance beneath a ship which occurs when the ship moves through the water and is caused both by bodily sinkage and by change of trim. The effect is accentuated in shallow water and is reduced with a reduction in ship's speed.

8. *Ship stability<sup>2</sup>, construction and damage control*

- (a) Understanding fundamental principles of ship construction and the theories and factors affecting trim and stability and measures necessary to preserve safe trim and stability.
- (b) Knowledge of the effect on trim and stability of a ship in the event of damage to and consequent flooding of a compartment and counter measures to be taken.
- (c) Demonstrate use of stability, trim and stress tables, diagrams and stress calculating equipment, including knowledge of loading cargoes and ballasting in order to keep hull stresses within acceptable limits.
- (d) General knowledge of the principal structural members of a ship and the proper names of the various parts.
- (e) Knowledge of IMCO recommendations concerning ship stability.

9. *Ship power plants*

- (a) Operating principles of marine power plants.
- (b) Ships' auxiliary machinery.
- (c) General knowledge of marine engineering terms.

10. *Cargo handling and stowage*

- (a) The stowage and securing of cargoes on board ships, including cargo gear.
- (b) Loading and discharging operations, with special regard to loading and discharging of heavy weights.
- (c) International regulations and recommendations relating to the carriage of cargoes, in particular the International Maritime Dangerous Goods Code (IMDG).
- (d) Carriage of dangerous goods; precautions to be taken during loading and discharging operations and the care of dangerous goods during a voyage.
- (e) Working knowledge of contents and application of current relevant tanker safety guides.
- (f) Working knowledge of commonly used cargo piping and pumping arrangements.
- (g) Terms and definitions used to describe properties of common oil cargoes, such as crude oil, middle distillates, naphtha.
- (h) Pollution regulations; ballasting, tank cleaning and gas freeing operations.
- (i) Load-on-top procedures.

11. *Fire prevention and fire-fighting appliances*

- (a) Organization of fire drills.
- (b) Classes and chemistry of fire.

<sup>2</sup> Masters and chief mates serving on small ships shall be fully acquainted with the basic stability requirements of such ships.

- (c) Fire-fighting systems.
- (d) Attendance at an approved fire-fighting course.
- (e) Knowledge of regulations concerning fire-fighting equipment.

12. *Emergency procedures*

- (a) Precautions when beaching a ship.
- (b) Action to be taken prior to, and after, grounding.
- (c) Floating a grounded ship, with and without assistance.
- (d) Action to be taken following a collision.
- (e) Temporary plugging of leaks.
- (f) Measures for the protection and safety of passengers and crew in emergencies.
- (g) Limiting damage and salvaging the ship following a fire or explosion.
- (h) Abandoning ship.
- (i) Emergency steering, rigging and use of jury steering and the means of rigging a jury rudder, where practicable.
- (j) Rescuing persons from a ship in distress or from a wreck.
- (k) Man-overboard procedures.

13. *Medical care*

A thorough knowledge of the use of the contents of the following publications:

- (a) International Medical Guide for Ships or equivalent national publications;
- (b) Medical section of the International Code of Signals;
- (c) Medical First Aid Guide For Use in Accidents Involving Dangerous Goods.

14. *Maritime law*

(a) A knowledge of international maritime law as embodied in international agreements and conventions as they affect the specific obligations and responsibilities of the master, particularly those concerning safety and the protection of the marine environment. Regard shall be paid especially to the following subjects:

- (i) certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity;
- (ii) responsibilities under the relevant requirements of the International Convention on Load Lines;
- (iii) responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea;

- (iv) responsibilities under international conventions for the prevention of pollution from ships;
- (v) maritime declarations of health; the requirements of the International Health Regulations;
- (vi) responsibilities under the Convention on the International Regulations for Preventing Collisions at Sea;
- (vii) responsibilities under other international instruments affecting the safety of the ship, passengers, crew and cargo.

(b) The extent of knowledge of national maritime legislation is left to the discretion of the Administration but shall include national arrangements for implementing international agreements and conventions.

15. *Personnel management and training responsibilities*

A knowledge of personnel management, organization and training aboard ships.

16. *Communications*

(a) Ability to transmit and receive messages by morse light and to use the International Code of Signals; where the Administration has examined candidates in these subjects at the lower levels of certification, they may have the option of not re-examining in these subjects for certification as master.

(b) Knowledge of procedures used in radiotelephone communications and ability to use radiotelephones, in particular with respect to distress, urgency, safety and navigational messages.

(c) A knowledge of the procedures for emergency distress signals by radiotelegraphy as prescribed in the Radio Regulations.

17. *Life-saving*

A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea), organization of abandon ship drills, lifeboats, liferafts and other life-saving equipment.

18. *Search and rescue*

A thorough knowledge of the IMCO Merchant Ship Search and Rescue Manual (MERSAR).

19. *Methods for demonstration of proficiency*

(a) *Navigation*

Demonstrate the use of sextant, pelorus, azimuth mirror and ability to plot position, course, bearings.

(b) *International Regulations for Preventing Collisions at Sea*

- (i) use of small models displaying proper signals of lights, or navigation light simulator;

- (ii) manoeuvring board or radar simulator.
- (c) Radar
  - (i) radar simulator; or
  - (ii) manoeuvring boards.
- (d) Fire-fighting
  - Attendance at an approved fire-fighting course.
- (e) Communications
  - Visual and vocal practical test.
- (f) Life-saving
  - Launching and handling of lifeboats and other life-saving appliances, including the donning of life-jackets.

**Regulation II/3**

*Mandatory Minimum Requirements for Certification of Officers  
in Charge of a Navigational Watch and of Masters of  
Ships of Less than 200 Gross Register Tons*

1. **Ships not engaged on near-coastal voyages**
  - (a) Every master serving on a sea-going ship of less than 200 gross register tons not engaged on near-coastal voyages shall hold a certificate recognized by the Administration for service as master of ships of between 200 and 1 600 gross register tons.
  - (b) Every officer in charge of a navigational watch serving on a sea-going ship of less than 200 gross register tons not engaged on near-coastal voyages shall hold an appropriate certificate for ships of 200 gross register tons or more.
2. **Ships engaged on near-coastal voyages**
  - (a) **Master**
    - (i) Every master serving in a sea-going ship of less than 200 gross register tons engaged on near-coastal voyages shall hold an appropriate certificate.
    - (ii) Every candidate for certification shall:
      - (1) be not less than 20 years of age;
      - (2) have approved sea-going service of not less than 12 months as officer in charge of a navigational watch;
      - (3) satisfy the Administration that he possesses adequate knowledge appropriate to his duties on the ships concerned which shall include the subjects contained in the Appendix to this Regulation.
  - (b) **Officer in charge of a navigational watch**
    - (i) Every officer in charge of a navigational watch on a sea-going ship of less than 200 gross register tons engaged on near-coastal voyages

shall hold an appropriate certificate.

(ii) Every candidate for certification shall:

- (1) be not less than 18 years of age;
- (2) satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
- (3) satisfy the Administration that he has:
  - successfully undergone special training, including an adequate period of appropriate sea-going service as required by the Administration; or
  - completed approved sea-going service in the deck department of not less than three years;
- (4) satisfy the Administration that he possesses adequate knowledge appropriate to his duties on the ships concerned, which shall include the subjects contained in the Appendix.

### 3. Training

Training to achieve the necessary knowledge and practical experience shall be based on Regulation II/1 - "Basic Principles to be Observed in Keeping a Navigational Watch" and relevant international regulations and recommendations.

### 4. Exemptions

The Administration, if it considers that a ship's size and the conditions of its voyage are such as to render the application of the full requirements of this Regulation and its Appendix unreasonably or impracticable, may to that extent exempt the master and the officer in charge of a navigational watch on such a ship or class of ships from some of the requirements, bearing in mind the safety of all ships which may be operating in the same waters.

#### APPENDIX TO REGULATION II/3

Minimum knowledge required for certification of officers in charge of a navigational watch and of masters of ships of less than 200 gross register tons

1. (a) Knowledge of the following:
  - (i) coastal navigation and, to the extent required, celestial navigation;
  - (ii) International Regulations for Preventing Collisions at Sea;
  - (iii) International Maritime Dangerous Goods Code (IMDG);
  - (iv) magnetic compass;
  - (v) radiotelephony and visual signalling;
  - (vi) fire prevention and fire-fighting appliances;
  - (vii) life-saving;



- (viii) emergency procedures;
  - (ix) ship manoeuvring;
  - (x) ship stability;
  - (xi) meteorology;
  - (xii) small ship power plants;
  - (xiii) first aid;
  - (xiv) search and rescue;
  - (xv) prevention of pollution of the marine environment.
- (b) In addition to the requirements of sub-paragraph (a), sufficient knowledge to operate safely all navigational aids and equipment fitted aboard the ships concerned.
- (c) The level of knowledge to be required in the subjects specified in sub-paragraphs (a) and (b) shall be sufficient for the officer of the watch to carry out his duties safely.
2. Every master serving on a sea-going ship of less than 200 gross register tons shall, in addition to the requirements of paragraph 1 above, satisfy the Administration that he possesses the knowledge to carry out all the duties of such a master safely.

Regulation II/4

*Mandatory Minimum Requirements for Certification  
of Officers in Charge of a Navigational Watch  
on Ships of 200 Gross Register Tons  
or More*

1. Every officer in charge of a navigational watch serving on a sea-going ship of 200 gross register tons or more shall hold an appropriate certificate.
2. Every candidate for certification shall:
- (a) be not less than 18 years of age;
  - (b) satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
  - (c) have approved sea-going service in the deck department of not less than three years which shall include at least six months of bridge watchkeeping duties under the supervision of a qualified officer; however, an Administration may allow the substitution of a period of special training for not more than two years of this approved sea-going service, provided the Administration is satisfied that such training is at least equivalent in value to the period of sea-going service it replaces;
  - (d) satisfy the Administration by passing an appropriate examination that he possesses adequate theoretical and practical knowledge appropriate to his duties.

3. **Certificates for service without restriction**

For issue of certificates for service without restriction as to area of operation, the examination shall test the adequacy of the candidate's theoretical and practical knowledge in the subjects shown in the Appendix to this Regulation.

4. **Restricted certificates**

For issue of restricted certificates for service on near-coastal voyages, the Administration may omit the following subjects from those shown in the Appendix, bearing in mind the effect on the safety of all ships which may be operating in the same waters:

- (a) celestial navigation;
- (b) electronic systems of position fixing and navigation for waters not covered by such systems.

5. **Level of knowledge**

(a) The level of knowledge to be required in the subjects shown in the Appendix shall be sufficient for the officer of the watch to carry out his watchkeeping duties safely. In determining the appropriate level of knowledge the Administration shall take into account the remarks under each subject in the Appendix.

(b) Training to achieve the necessary theoretical knowledge and practical experience shall be based on Regulation II/1 – "Basic Principles to be Observed in Keeping a Navigational Watch" and relevant international regulations and recommendations.

**APPENDIX TO REGULATION II/4**

**Minimum knowledge required for certification of officers in charge of a navigational watch on ships of 200 gross register tons or more**

1. ***Celestial navigation***

Ability to use celestial bodies to determine the ship's position and compass errors.

2. ***Terrestrial and coastal navigation***

(a) **Ability to determine the ship's position by the use of:**

- (i) landmarks;
- (ii) aids to navigation, including lighthouses, beacons and buoys;
- (iii) dead reckoning, taking into account winds, tides, currents and speed by propeller revolutions per minute and by log.

(b) Thorough knowledge of and ability to use navigational charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ships' routing information.

3. *Radar navigation*

Knowledge of the fundamentals of radar and ability in the operation and use of radar and ability to interpret and analyse information obtained by use of radar including the following:

- (a) factors affecting performance and accuracy;
- (b) setting up and maintaining displays;
- (c) detection of misrepresentation of information, false echoes, sea return, etc.;
- (d) range and bearing;
- (e) identification of critical echoes;
- (f) course and speed of other ships;
- (g) time and distance of closest approach of crossing, meeting or overtaking ships;
- (h) detecting course and speed changes of other ships;
- (i) effect of changes in own ship's course or speed or both;
- (j) application of the International Regulations for Preventing Collisions at Sea.

4. *Watchkeeping*

- (a) Demonstrate thorough knowledge of content, application and intent of the International Regulations for Preventing Collisions at Sea, including those Annexes concerned with safe navigation.
- (b) Demonstrate knowledge of content of Regulation II/1 - "Basic Principles to be Observed in Keeping a Navigational Watch".

5. *Electronic systems of position fixing and navigation*

Ability to determine the ship's position by the use of electronic navigational aids to the satisfaction of the Administration.

6. *Radio direction-finders and echo-sounders*

Ability to operate the equipment and apply the information correctly.

7. *Meteorology*

Knowledge of shipborne meteorological instruments and their application. Knowledge of the characteristics of various weather systems, reporting procedures and recording systems and the ability to apply the meteorological information available.

8. *Compasses - magnetic and gyro*

Knowledge of the principles of magnetic and gyro-compasses including errors and corrections. With regard to gyro-compasses, an understanding of the systems under the control of the master gyro and a knowledge of the operation and care of the main types of gyro-compasses.

9. *Automatic pilot*

Knowledge of automatic pilot systems and procedures.

10. *Radiotelephony and visual signalling*

- (a) Ability to transmit and receive messages by morse light.
- (b) Ability to use the International Code of Signals.
- (c) Knowledge of procedures used in radiotelephone communications and ability to use radiotelephones, in particular with respect to distress, urgency, safety and navigational messages.

11. *Fire prevention and fire-fighting appliances*

- (a) Ability to organize fire drills.
- (b) Knowledge of classes and chemistry of fire.
- (c) Knowledge of fire-fighting systems.
- (d) Attendance at an approved fire-fighting course.

12. *Life-saving*

Ability to organize abandon ship drills and knowledge of the operation of lifeboats, liferafts, buoyant apparatus and similar life-saving appliances along with their equipment, including portable radio apparatus and emergency position-indicating radio beacons (EPIRBs). Knowledge of survival at sea techniques.

13. *Emergency procedures*

Knowledge of the items listed in the appropriate Appendix of the current edition of the ILO/IMCO "Document for Guidance".

14. *Ship manoeuvring and handling*

Knowledge of:

- (a) the effects of various deadweights, draughts, trim, speed and under keel clearance on turning circles and stopping distances;
- (b) effects of wind and current on ship handling;
- (c) manoeuvres for the rescue of man-overboard;
- (d) squat, shallow water and similar effects;
- (e) proper procedures for anchoring and mooring.

15. *Ship stability*

- (a) Working knowledge and application of stability, trim and stress tables, diagrams and stress calculating equipment.
- (b) Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy.

16. *English language*

Adequate knowledge of the English language enabling the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation and to express himself clearly in his communications with other ships or coast stations. Ability to understand and use the IMCO Standard Marine Navigational Vocabulary.

17. *Ship construction*

General knowledge of the principal structural members of a ship and the proper names of the various parts.

18. *Cargo handling and stowage*

Knowledge of safe handling and stowage of cargoes and the effect of these factors on the safety of the ship.

19. *Medical aid*

Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship.

20. *Search and rescue*

Knowledge of the IMCO Merchant Ship Search and Rescue Manual (MERSAR).

21. *Prevention of pollution of the marine environment*

Knowledge of the precautions to be observed to prevent pollution of the marine environment.

**Regulation II/5**

***Mandatory Minimum Requirements to Ensure the Continued Proficiency and Updating of Knowledge for Masters and Deck Officers***

1. Every master and every deck officer holding a certificate who is serving at sea or intends to return to sea after a period ashore shall, in order to continue to qualify for sea-going service, be required at regular intervals not exceeding five years to satisfy the Administration as to:

- (a) medical fitness, particularly regarding eyesight and hearing; and
- (b) professional competence:
  - (i) by approved sea-going service as master or deck officer of at least one year during the preceding five years; or
  - (ii) by virtue of having performed functions relating to the duties appropriate to the grade of certificate held which are considered to be at least equivalent to the sea-going service required in paragraph 1(b)(i); or
  - (iii) by one of the following:
    - passing an approved test; or
    - successfully completing an approved course or courses; or
    - having completed approved sea-going service as a deck officer for a period of not less than three months in a supernumerary capacity immediately prior to taking up the rank to which he is entitled by virtue of his certificate.

2. The Administration shall, in consultation with those concerned, formulate or promote the formulation of a structure of refresher and updating courses, either voluntary or mandatory, as appropriate, for masters and deck officers who are serving at sea, especially for re-entrants to sea-going service. The Administration shall ensure that arrangements are made to enable all persons concerned to attend such courses as appropriate to their experience and duties. Such courses shall be approved by the Administration and include changes in marine technology and relevant international regulations and recommendations concerning the safety of life at sea and the protection of the marine environment.

3. Every master and deck officer shall, for continuing sea-going service on board ships for which special training requirements have been internationally agreed upon, successfully complete an approved relevant training.

4. The Administration shall ensure that the texts of recent changes in international regulations concerning the safety of life at sea and the protection of the marine environment are made available to ships under its jurisdiction.

#### Regulation II/6

##### *Mandatory Minimum Requirements for Ratings Forming Part of a Navigational Watch*

1. The minimum requirements for a rating forming part of a navigational watch on a sea-going ship of 200 gross register tons or more are set out in paragraph 2. These requirements are not those for certification of able seamen<sup>a</sup>, nor, except for ships of limited size, are they minimum requirements for a rating who is to be the sole rating of a navigational watch. Administrations may require additional training and qualifications for a rating who is to be the sole rating of a navigational watch.

<sup>a</sup> Reference is made to ILO Certification of Able Seamen Convention, 1946 or any successive convention.

2. Every rating forming part of a navigational watch on a sea-going ship of 200 gross register tons or more shall:

- (a) be not less than 16 years of age;
- (b) satisfy the Administration as to medical fitness, particularly regarding eyesight and hearing;
- (c) satisfy the Administration that he has:
  - (i) completed approved sea-going service, including not less than six months' sea experience associated, in particular, with navigational watchkeeping duties; or
  - (ii) successfully undergone special training, either pre-sea or aboard ship, including an adequate period of sea-going service as required by the Administration which shall be not less than two months;
- (d) have experience or training which includes:
  - (i) basic principles of fire-fighting, first aid, personal survival techniques, health hazards and personal safety;
  - (ii) ability to understand orders and make himself understood by the officer of the watch in matters relevant to his duties;
  - (iii) ability to steer and comply with helm orders, together with sufficient knowledge of magnetic and gyro compasses for performance of these duties;
  - (iv) ability to keep a proper look-out by sight and hearing and report the approximate bearing of a sound signal, light or other object in degrees or points;
  - (v) familiarity with the change-over from automatic pilot to hand steering and vice-versa;
  - (vi) knowledge of the use of appropriate internal communication and alarm systems;
  - (vii) knowledge of pyrotechnic distress signals;
  - (viii) knowledge of his emergency duties;
  - (ix) knowledge of shipboard terms and definitions appropriate to his duties.

3. The experience, service or training required by paragraphs 2(c) and (d) may be acquired through performance of duties associated with navigational watchkeeping, but only if such duties are carried out under the direct supervision of the master, officer in charge of the navigational watch or a qualified rating.

4. Administrations shall ensure that an authorized document is issued to every seafarer who by experience or training is qualified in accordance with this Regulation to serve as a rating forming part of a navigational watch, or that his existing document is duly endorsed.

5. A seafarer may be considered by the Administration to have met the requirements of this Regulation if he has served in a relevant capacity in the deck department for a period of not less than one year within the last five years preceding the entry into force of the Convention for that Administration.

**Regulation II/7**

***Basic Principles to be Observed  
in Keeping a Watch in Port***

1. On any ship safely moored or safely at anchor under normal circumstances in port, the master shall arrange for an appropriate and effective watch to be maintained for the purpose of safety.
2. In organizing the watches note shall be taken of the provisions of the "Recommendation on Principles and Operational Guidance for Deck Officers in Charge of a Watch in Port" and the "Recommendation on Principles and Operational Guidance for Engineer Officers in Charge of an Engineering Watch in Port" adopted by the International Conference on Training and Certification of Seafarers, 1978.

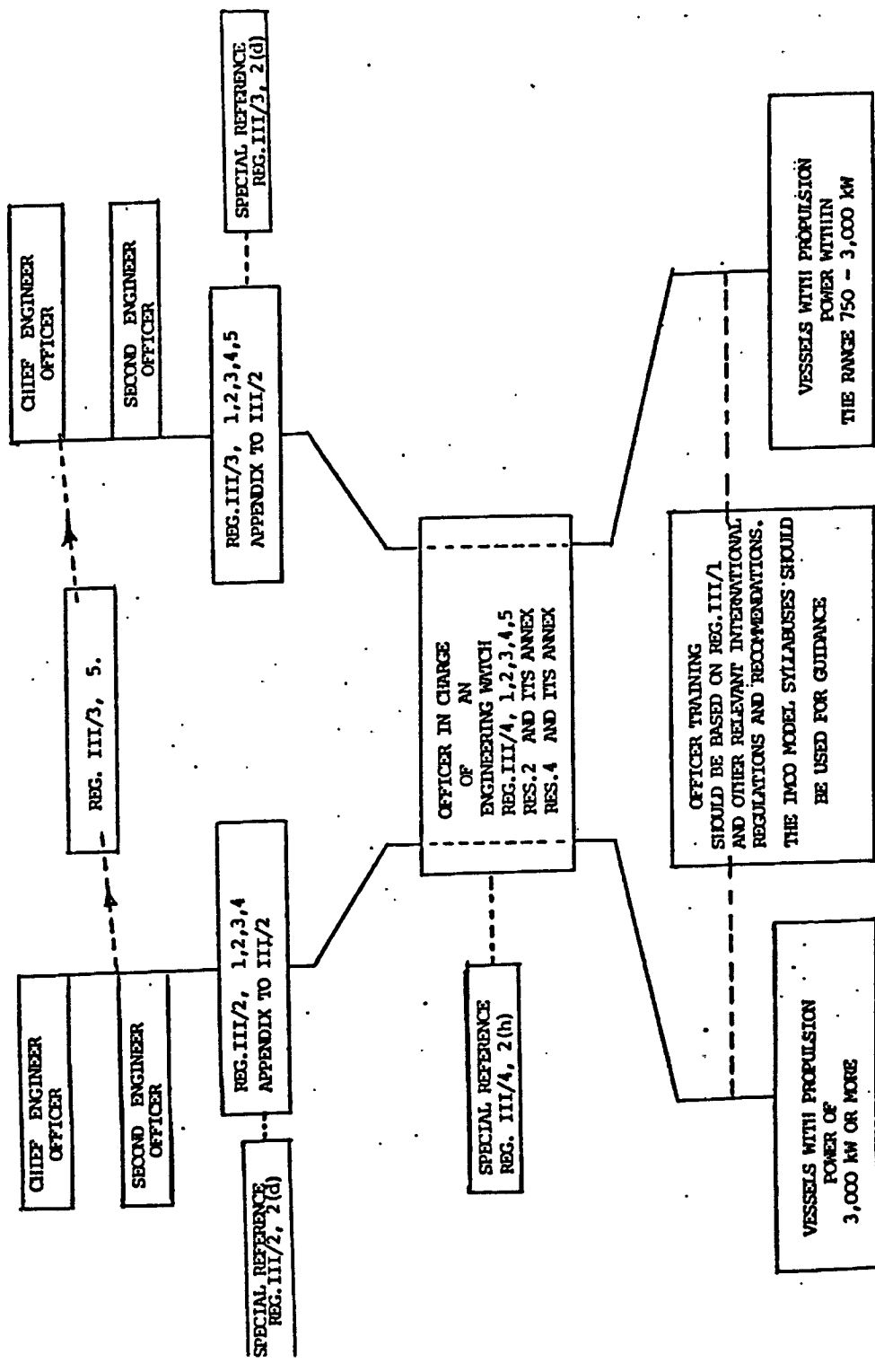
**Regulation II/8**

***Mandatory Minimum Requirements for a Watch in Port on Ships  
Carrying Hazardous Cargo***

1. The master of every ship carrying cargo in bulk that is hazardous - whether it is, or may be, explosive, flammable, toxic, health-threatening or environment polluting - shall ensure that a safe deck watch and a safe engineering watch are maintained by the ready availability on board of a duly qualified officer or officers, and ratings where appropriate, even when the ship is safely moored or safely at anchor in port.
2. The master of every ship carrying hazardous cargo other than in bulk - whether it is, or may be, explosive, flammable, toxic, health-threatening or environment polluting - shall in organizing safe watchkeeping arrangements take full account of the nature, quantity, packing and stowage of the hazardous cargo and of any special conditions on board, afloat and ashore.
3. In organizing the watches full account shall be taken of the "Recommendation on Principles and Operational Guidance for Deck Officers in Charge of a Watch in Port" and the "Recommendation on Principles and Operational Guidance for Engineer Officers in Charge of an Engineering Watch in Port" adopted by the International Conference on Training and Certification of Seafarers, 1978.



MAINE ENGINEER OFFICER TRAINING AND CERTIFICATION AS REQUIRED BY IMO SOLAS 1978 CONVENTION



**CHAPTER III**  
**ENGINE DEPARTMENT**

**Regulation III/1**

*Basic Principles to be Observed in  
Keeping an Engineering Watch*

1. Parties shall direct the attention of shipowners, ship operators, masters, chief engineer officers and watchkeeping personnel to the following principles which shall be observed to ensure that a safe engineering watch is maintained at all times.

2. The term "watch" is used in this Regulation to mean either a group of personnel composing the watch or a period of responsibility for an engineer officer during which his physical presence in the machinery space may or may not be required.

3. The basic principles, including but not limited to the following, shall be taken into account on all ships.

4. **General**

(a) The chief engineer officer of every ship is bound, in consultation with the master, to ensure that watchkeeping arrangements are adequate to maintain a safe watch. When deciding the composition of the watch, which may include appropriate engine room ratings, the following criteria, *inter alia*, shall be taken into account:

- (i) type of ship;
- (ii) type and condition of the machinery;
- (iii) special modes of operation dictated by conditions such as weather, ice, contaminated water, shallow water, emergency conditions, damage containment or pollution abatement;
- (iv) qualifications and experience of the watch;
- (v) safety of life, ship, cargo and port, and protection of the environment;
- (vi) observance of international, national and local regulations;
- (vii) maintaining the normal operations of the ship.

(b) Under the direction of the chief engineer officer, the engineer officer in charge of the watch shall be responsible for the inspection, operation and testing, as required, of all machinery and equipment under his responsibility. The engineer officer in charge of a watch is the chief engineer officer's representative and his primary responsibility, at all times, shall be the safe and efficient operation and up-keep of machinery affecting the safety of the ship.

(c) The chief engineer officer shall, in consultation with the master, determine

in advance the needs of the intended voyage, taking into consideration the requirements for fuel, water, lubricants, chemicals, expendable and other spare parts, tools, supplies and any other requirements.

### 5. Operation

- (a) The engineer officer in charge of the watch shall ensure that the established watchkeeping arrangements are maintained. Under his general direction engine room ratings, if forming part of the watch, shall be required to assist in the safe and efficient operation of the propulsion machinery and the auxiliary equipment.
- (b) At the commencement of the engineering watch, the current operational parameters and condition of all machinery shall be verified. Any machinery not functioning properly, expected to malfunction or requiring special service, shall be noted along with any action already taken. Plans shall be made for any further action if required.
- (c) The engineer officer in charge of the watch shall ensure that the main propulsion plant and auxiliary systems are kept under constant surveillance. Inspections are made of the machinery and steering gear spaces at suitable intervals and appropriate action is taken to remedy any malfunction discovered.
- (d) When the machinery spaces are in the manned condition, the engineer officer in charge of the watch shall at all times be readily capable of operating the propulsion equipment in response to needs for changes in direction or speed. When the machinery spaces are in the periodic unmanned condition, the designated duty engineer officer in charge of the watch shall be immediately available and on call to attend the machinery spaces.
- (e) All bridge orders shall be promptly executed. Changes in direction or speed of the main propulsion unit shall be recorded, except where an Administration determines that the size or characteristics of a particular ship make such recording impracticable. The engineer officer in charge of the watch shall ensure that the main propulsion unit controls, when in the manual mode of operation, are continuously attended under standby or manoeuvring conditions.
- (f) The engineer officer in charge of the watch shall not be assigned or undertake any duties which would interfere with his supervisory duty in respect of the main propulsion system and its ancillary equipment and he shall ensure that the main propulsion system and auxiliary equipment are kept under constant surveillance until he is properly relieved.
- (g) Due attention shall be paid to the maintenance and support of all machinery, including mechanical, electrical, hydraulic and pneumatic systems, their control apparatus and associated safety equipment, all accommodation service systems equipment and the recording of stores and spare gear usage.
- (h) The chief engineer officer shall ensure that the engineer officer in charge of the watch is informed of all preventive maintenance, damage control, or repair operations to be performed during the watch. The engineer officer in charge of the watch shall be responsible for the isolation, by-passing and adjustment of all machinery under his responsibility that is to be worked on, and shall record all work carried out.
- (i) Before going off duty, the engineer officer in charge of the watch shall ensure that all events related to the main and auxiliary machinery are suitably recorded.

(j) To avoid any danger to the safety of the ship and its crew, the engineer officer in charge of the watch shall notify the bridge immediately in the event of fire, impending actions in machinery spaces that may cause reduction in ship's speed, imminent steering failure, stoppage of the ship's propulsion system or any alteration in the generation of electric power, or similar threat to safety. This notification, where possible, shall be accomplished before changes are made in order to afford the bridge the maximum available time to take whatever actions are possible to avoid a potential marine casualty.

(k) When the engine room is put in a standby condition, the engineer officer in charge of the watch shall ensure that all machinery and equipment which may be used during manoeuvring is in a state of immediate readiness and that an adequate reserve of power is available for steering gear and other requirements.

#### 6. Watch requirements

(a) Every member of the watch shall be familiar with his assigned watchkeeping duties. In addition, every member shall have with respect to that ship:

- (i) knowledge of the use of appropriate internal communication systems;
- (ii) knowledge of escape routes from machinery spaces;
- (iii) knowledge of engine room alarm systems and the ability to distinguish between the various alarms with special reference to the CO<sub>2</sub> alarm;
- (iv) knowledge of the positions and use of the fire-fighting equipment in the machinery spaces.

(b) The composition of an underway watch shall, at all times, be adequate to ensure the safe operation of all machinery affecting the operation of the ship, in either automated or manual mode and be appropriate to the prevailing circumstances and conditions. To achieve this, the following, *inter alia*, shall be taken into account:

- (i) adequate supervision, at all times, of machinery affecting the safe operation of the ship;
- (ii) condition and reliability of any remotely operated propulsion and steering equipment and their controls, control location and the procedures involved in placing them in a manual mode of operation in the event of break-down or emergency;
- (iii) location and operation of fixed fire detection, fire extinction or fire containment devices and apparatus;
- (iv) use and operational condition of auxiliary, standby and emergency equipment affecting the safe navigation, mooring or docking operations of the ship;
- (v) steps and procedures necessary to maintain the condition of machinery installations in order to ensure their efficient operation during all modes of ship operation;
- (vi) any other demands on the watch which may arise as a result of special operating circumstances.

(c) At an unsheltered anchorage the chief engineer officer shall consult with the master whether or not to maintain an underway watch.

**7. Fitness for duty**

The watch system shall be such that the efficiency of the watch is not impaired by fatigue. Duties shall be so organized by the chief engineer officer that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.

**8. Protection of the marine environment**

All engineer officers and engine room ratings shall be aware of the serious effects of operational or accidental pollution of the marine environment and shall take all possible precautions to prevent such pollution, particularly within the framework of relevant international and port regulations.

**Regulation III/2**

*Mandatory Minimum Requirements for Certification of Chief  
Engineer Officers and Second Engineer Officers of Ships  
Powered by Main Propulsion Machinery of  
3 000 kW Propulsion Power or More*

1. Every chief engineer officer and second engineer officer of a sea-going ship powered by main propulsion machinery of 3 000 kW propulsion power or more shall hold an appropriate certificate.

2. Every candidate for certification shall:

- (a) satisfy the Administration as to medical fitness, including eyesight and hearing;
- (b) meet the requirements for certification as an engineer officer in charge of a watch; and
  - (i) for certification as second engineer officer, have not less than 12 months' approved sea-going service as assistant engineer officer or engineer officer;
  - (ii) for certification as chief engineer officer, have not less than 36 months' approved sea-going service of which not less than 12 months shall be served as an engineer officer in a position of responsibility while qualified to serve as second engineer officer;
- (c) have attended an approved practical fire-fighting course;
- (d) have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix to this Regulation, except that the Administration may vary these examination requirements for officers of ships with limited propulsion power that are engaged on near-coastal voyages, as it considers necessary, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

3. Training to achieve the necessary theoretical knowledge and practical experience shall take into account relevant international regulations and recommendations.

4. The level of knowledge required under the different paragraphs of the Appendix may be varied according to whether the certificate is being issued at chief engineer officer or second engineer officer level.

APPENDIX TO REGULATION III/2

Minimum knowledge required for certification of chief engineer officers and second engineer officers of ships powered by main propulsion machinery of 3 000 kW propulsion power or more

1. The syllabus given below is compiled for examination of candidates for certification as chief engineer officer or second engineer officer of ships powered by main propulsion machinery of 3 000 kW propulsion power or more. Bearing in mind that a second engineer officer shall be in a position to assume the responsibilities of a chief engineer officer at any time, examination in these subjects shall be designed to test the candidate's ability to assimilate all available information that affects the safe operation of the ship's machinery.
2. With respect to paragraph 4(a) below, the Administration may omit knowledge requirements for types of propulsion machinery other than those machinery installations for which the certificate to be awarded shall be valid. A certificate awarded on such a basis shall not be valid for any category of machinery installation which has been omitted until the engineer officer proves to be competent in these items to the satisfaction of the Administration. Any such limitation shall be stated in the certificate.
3. Every candidate shall possess theoretical knowledge in the following subjects:
  - (a) thermodynamics and heat transmission;
  - (b) mechanics and hydromechanics;
  - (c) operational principles of ships' power installations (diesel, steam and gas turbine) and refrigeration;
  - (d) physical and chemical properties of fuels and lubricants;
  - (e) technology of materials;
  - (f) chemistry and physics of fire and extinguishing agents;
  - (g) marine electrotechnology, electronics and electrical equipment;
  - (h) fundamentals of automation, instrumentation and control systems;
  - (i) naval architecture and ship construction, including damage control.
4. Every candidate shall possess adequate practical knowledge in at least the following subjects:
  - (a) operation and maintenance of:
    - (i) marine diesel engines;
    - (ii) marine steam propulsion plant;

- (iii) marine gas turbines;
- (b) operation and maintenance of auxiliary machinery, including pumping and piping systems, auxiliary boiler plant and steering gear systems;
- (c) operation, testing and maintenance of electrical and control equipment;
- (d) operation and maintenance of cargo handling equipment and deck machinery;
- (e) detection of machinery malfunction, location of faults and action to prevent damage;
- (f) organization of safe maintenance and repair procedures;
- (g) methods of, and aids for, fire prevention, detection and extinction;
- (h) methods and aids to prevent pollution of the environment by ships;
- (i) regulations to be observed to prevent pollution of the marine environment;
- (j) effects of marine pollution on the environment;
- (k) first aid related to injuries which might be expected in machinery spaces and use of first aid equipment;
- (l) functions and use of life-saving appliances;
- (m) methods of damage control;
- (n) safe working practices.

5. Every candidate shall possess a knowledge of international maritime law embodied in international agreements and conventions as they affect the specific obligations and responsibilities of the engine department, particularly those concerning safety and the protection of the marine environment. The extent of knowledge of national maritime legislation is left to the discretion of the Administration but shall include national arrangements for implementing international agreements and conventions.

6. Every candidate shall possess a knowledge of personnel management, organization and training aboard ships.

#### Regulation III/3

*Mandatory Minimum Requirements for Certification of Chief Engineer Officers and Second Engineer Officers of Ships Powered by Main Propulsion Machinery between 750 kW and 3 000 kW Propulsion Power*

1. Every chief engineer officer and second engineer officer of a sea-going ship powered by main propulsion machinery of between 750 and 3 000 kW propulsion power shall hold an appropriate certificate.

2. Every candidate for certification shall:

- (a) satisfy the Administration as to medical fitness, including eyesight and hearing;

- (b) meet the requirements for certification as an engineer officer in charge of a watch; and
  - (i) for certification as second engineer officer, have not less than 12 months' approved sea-going service as assistant engineer officer or engineer officer;
  - (ii) for certification as chief engineer officer, have not less than 24 months' approved sea-going service of which not less than 12 months shall be served while qualified to serve as second engineer officer;
- (c) have attended an approved practical fire-fighting course;
- (d) have passed appropriate examination to the satisfaction of the Administration. Such examination shall include the material set out in the Appendix to this Regulation, except that the Administration may vary the requirements for examination and sea-going service for officers of ships engaged on near-coastal voyages, bearing in mind the types of automatic and remotely operated controls with which such ships are fitted and the effect on the safety of all ships which may be operating in the same waters.

3. Training to achieve the necessary theoretical knowledge and practical experience shall take into account relevant international regulations and recommendations.

4. The level of knowledge required under the different paragraphs of the Appendix may be varied according to whether the certificate is being issued at chief engineer officer or second engineer officer level.

5. Every engineer officer who is qualified to serve as second engineer officer of ships powered by main propulsion machinery of 3 000 kW propulsion power or more, may serve as chief engineer officer of ships powered by main propulsion machinery of less than 3 000 kW propulsion power provided that not less than 12 months' approved sea-going service shall have been served as an engineer officer in a position of responsibility.

#### APPENDIX TO REGULATION III,3

##### Minimum knowledge required for certification of chief engineer officers and second engineer officers of ships powered by main propulsion machinery of between 750 kW and 3 000 kW propulsion power

1. The syllabus given below is compiled for examination of candidates for certification as chief engineer officer or second engineer officer of ships powered by main propulsion machinery of between 750 kW and 3 000 kW propulsion power. Bearing in mind that a second engineer officer shall be in a position to assume the responsibilities of the chief engineer officer at any time, examination in these subjects shall be designed to test the candidate's ability to assimilate all available information that affects the safe operation of the ship's machinery.

2. With respect to paragraphs 3(d) and 4(a) below, the Administration may omit knowledge requirements for types of propulsion machinery other than



these machinery installations for which the certificate to be awarded shall be valid. A certificate awarded on such a basis shall not be valid for any category of machinery installation which has been omitted until the engineer officer proves to be competent in these items to the satisfaction of the Administration. Any such limitation shall be stated in the certificate.

3. Every candidate shall possess sufficient elementary theoretical knowledge to understand the basic principles involved in the following subjects:

- (a) combustion processes;
- (b) heat transmission;
- (c) mechanics and hydromechanics;
- (d) (i) marine diesel engines;  
(ii) marine steam propulsion plant;  
(iii) marine gas turbines;
- (e) steering gear systems;
- (f) properties of fuels and lubricants;
- (g) properties of materials;
- (h) fire-extinguishing agents;
- (i) marine electrical equipment;
- (j) automation, instrumentation and control systems;
- (k) ship construction, including damage control;
- (l) auxiliary systems.

4. Every candidate shall possess adequate practical knowledge, in at least the following subjects:

- (a) operation and maintenance of:
  - (i) marine diesel engines;
  - (ii) marine steam propulsion plant;
  - (iii) marine gas turbines;
- (b) operation and maintenance of auxiliary machinery systems, including steering gear systems;
- (c) operation, testing and maintenance of electrical and control equipment;
- (d) operation and maintenance of cargo handling equipment and deck machinery;
- (e) detection of machinery malfunction, location of faults and action to prevent damage;
- (f) organization of safe maintenance and repair procedures;
- (g) methods of, and aids for, fire prevention, detection and extinction;
- (h) regulations to be observed regarding pollution of the marine environment and methods and aids to prevent such pollution;

- (i) first aid related to injuries which might be expected in machinery spaces and use of first aid equipment;
  - (j) functions and use of life-saving appliances;
  - (k) methods of damage control with specific reference to action to be taken in the event of flooding of sea water into the engine room;
  - (l) safe working practices.
5. Every candidate shall possess a knowledge of international maritime law as embodied in international agreements and conventions as they affect the specific obligations and responsibilities of the engine department, particularly those concerning safety and the protection of the marine environment. The extent of knowledge of national maritime legislation is left to the discretion of the Administration but shall include national arrangements for implementing international agreements and conventions.
6. Every candidate shall possess a knowledge of personnel management, organization and training aboard ships.

#### Regulation III/4

##### *Mandatory Minimum Requirements for Certification of Engineer Officers in Charge of a Watch in a Traditionally Manned Engine Room or Designated Duty Engineer Officers in a Periodically Unmanned Engine Room*

1. Every engineer officer in charge of a watch in a traditionally manned engine room or the designated duty engineer officer in a periodically unmanned engine room on a sea-going ship powered by main propulsion machinery of 750 kW propulsion power or more shall hold an appropriate certificate.
2. Every candidate for certification shall:
- (a) be not less than 18 years of age;
  - (b) satisfy the Administration as to medical fitness, including eyesight and hearing;
  - (c) have not less than a total of three years approved education or training, relevant to the duties of a marine engineer;
  - (d) have completed an adequate period of sea-going service which may have been included within the period of three years stated in subparagraph (c);
  - (e) satisfy the Administration that he has the theoretical and practical knowledge of the operation and maintenance of marine machinery appropriate to the duties of an engineer officer;
  - (f) have attended an approved practical fire-fighting course;
  - (g) have knowledge of safe working practices.

The Administration may vary the requirement of sub-paragraphs (c) and (d) for engineer officers of ships powered by main propulsion machinery of less than 3 000 kW propulsion power engaged on near-coastal voyages, bearing in mind the effect on the safety of all ships which may be operating in the same waters.

3. Every candidate shall have knowledge of the operation and maintenance of main and auxiliary machinery, which shall include knowledge of relevant regulatory requirements and also knowledge of at least the following specific items:

- (a) *Watchkeeping routines*
  - (i) duties associated with taking over and accepting a watch;
  - (ii) routine duties undertaken during a watch;
  - (iii) maintenance of the machinery space log book and the significance of readings taken;
  - (iv) duties associated with handing over a watch.
- (b) *Main and auxiliary machinery*
  - (i) assisting in the preparation of main machinery and preparation of auxiliary machinery for operation;
  - (ii) operation of steam boilers, including combustion system;
  - (iii) methods of checking water level in steam boilers and action necessary if water level is abnormal;
  - (iv) location of common faults of machinery and plant in engine and boiler rooms and action necessary to prevent damage.
- (c) *Pumping systems*
  - (i) routine pumping operations;
  - (ii) operation of bilge, ballast and cargo pumping systems.
- (d) *Generating plant*

Preparing, starting, coupling and changing over alternators or generators.
- (e) *Safety and emergency procedures*
  - (i) safety precautions to be observed during a watch and immediate actions to be taken in the event of a fire or accident, with particular reference to oil systems;
  - (ii) safe isolation of electrical and other types of plant and equipment required before personnel are permitted to work on such plant and equipment.
- (f) *Anti-pollution procedures*

The precautions to be observed to prevent pollution of the environment by oil, cargo residue, sewage, smoke or other pollutants. The use of pollution prevention equipment, including oily water separators, sludge tank systems and sewage disposal plant.

(g) *First aid*

Basic first aid related to injuries which might be expected in machinery spaces.

4. Where steam boilers do not form part of a ship's machinery, the Administration may omit the knowledge requirements of paragraphs 3(b)(ii) and (iii). A certificate awarded on such a basis shall not be valid for service on ships in which steam boilers form part of a ship's machinery until the engineer officer proves to be competent in the omitted items to the satisfaction of the Administration. Any such limitations shall be stated in the certificate.

5. The training to achieve the necessary theoretical knowledge and practical experience shall take into account relevant international regulations and recommendations.

**Regulation III/5**

*Mandatory Minimum Requirements to Ensure the Continued Proficiency and Updating of Knowledge for Engineer Officers*

1. Every engineer officer holding a certificate who is serving at sea or intends to return to sea after a period ashore shall, in order to continue to qualify for sea-going service in the rank appropriate to his certificate, be required at regular intervals not exceeding five years to satisfy the Administration as to:

- (a) medical fitness, including eyesight and hearing; and
- (b) professional competence:

- (i) by approved service as an engineer officer of at least one year during the preceding five years; or
- (ii) by virtue of having performed functions relating to the duties appropriate to the grade of certificate held which is considered to be at least equivalent to the sea-going service required in paragraph 1(b)(i); or
- (iii) by one of the following:
  - passing an approved test; or
  - successfully completing an approved course or courses; or
  - having completed approved sea-going service as an engineer officer for a period of not less than three months in a supernumerary capacity, or in a lower rank than that for which he holds the certificate, immediately prior to taking up the rank to which he is entitled by virtue of his certificate.

2. The course or courses referred to in paragraph 1(b)(iii) shall include, in particular, changes in the relevant international regulations and recommendations concerning the safety of life at sea and the protection of the marine environment.

3. The Administration shall ensure that the texts of recent changes in international regulations concerning the safety of life at sea and the protection of the marine environment are made available to ships under its jurisdiction.

### Regulation III/6

#### *Mandatory Minimum Requirements for Ratings Forming Part of an Engine Room Watch*

1. The minimum requirements for a rating forming part of an engine room watch shall be as set out in paragraph 2. These requirements are not for:
  - (a) a rating nominated as the assistant to the engineer officer in charge of the watch\*;
  - (b) a rating who is under training;
  - (c) a rating whose duties while on watch are of an unskilled nature.
2. Every rating forming part of an engine room watch shall:
  - (a) be not less than 16 years of age;
  - (b) satisfy the Administration as to medical fitness, including eyesight and hearing;
  - (c) satisfy the Administration as to:
    - (i) experience or training regarding fire-fighting, basic first aid, personal survival techniques, health hazards and personal safety;
    - (ii) ability to understand orders, and make himself understood in matters relevant to his duties;
  - (d) satisfy the Administration that he has:
    - (i) shore experience relevant to his sea-going duties supplemented by an adequate period of sea-going service as required by the Administration; or
    - (ii) undergone special training either pre-sea or on board ship, including an adequate period of sea-going service as required by the Administration; or
    - (iii) approved sea-going service of at least six months.
3. Every such rating shall have knowledge of:
  - (a) engine room watchkeeping procedures and the ability to carry out a watch routine appropriate to his duties;
  - (b) safe working practices as related to engine room operations;
  - (c) terms used in machinery spaces and names of machinery and equipment relative to his duties;

\* Reference is made to Resolution 9 - "Recommendation on Minimum Requirements for a Rating nominated as the Assistant to the Engineer Officer in Charge of the Watch" adopted by the International Conference on Training and Certification of Seafarers, 1978.

(d) basic environmental protection procedures.

4. Every rating required to keep a boiler watch shall have knowledge of the safe operation of boilers, and shall have the ability to maintain the correct water levels and steam pressures.

5. Every rating forming part of an engine room watch shall be familiar with his watchkeeping duties in the machinery spaces on the ship on which he is to serve. In particular, with respect to that ship the rating shall have:

- (a) knowledge of the use of appropriate internal communication systems;
- (b) knowledge of escape routes from machinery spaces;
- (c) knowledge of engine room alarm systems and ability to distinguish between the various alarms with special reference to fire extinguishing gas alarms;
- (d) familiarity with the location and use of fire-fighting equipment in the machinery spaces.

6. A seafarer may be considered by the Administration to have met the requirements of this Regulation if he has served in a relevant capacity in the engine department for a period of not less than one year within the last five years preceding the entry into force of the Convention for that Administration.

# Training Programme

The training programme of the College is based on four main course/streams, each of which is appropriately subdivided into categories. To this is added a series of seminars and workshops which are quite separate from the mainstream of the curriculum.

**I OPERATIONS COURSES:** These deal primarily with the teaching of theoretical and practical knowledge, skills, methods and means to be instilled into the students, in order that they might on completion, join their colleagues already on-the-job, as valued assistants already grounded in practical experience.

**II TECHNICAL TRAINING COURSES:** These concern the actual maintenance and repair of port facilities, equipment, machinery and vehicles, essential to a smooth and continuing flow of port activities.

**III ADMINISTRATIVE COURSES:** These enable a proper accounting, distribution and application of port services and materials, essential to enable the operations of the port schedules.

**IV OTHER COURSES:** These comprehend miscellaneous but important aspects of port and port-related activities. They are quite selective and not applicable to the main stream of port activities courses.

**V SEMINARS & WORKSHOPS:** Simultaneously, and with the activities of the classes themselves, these functions enable participants to exchange views and experiences to their mutual benefit.

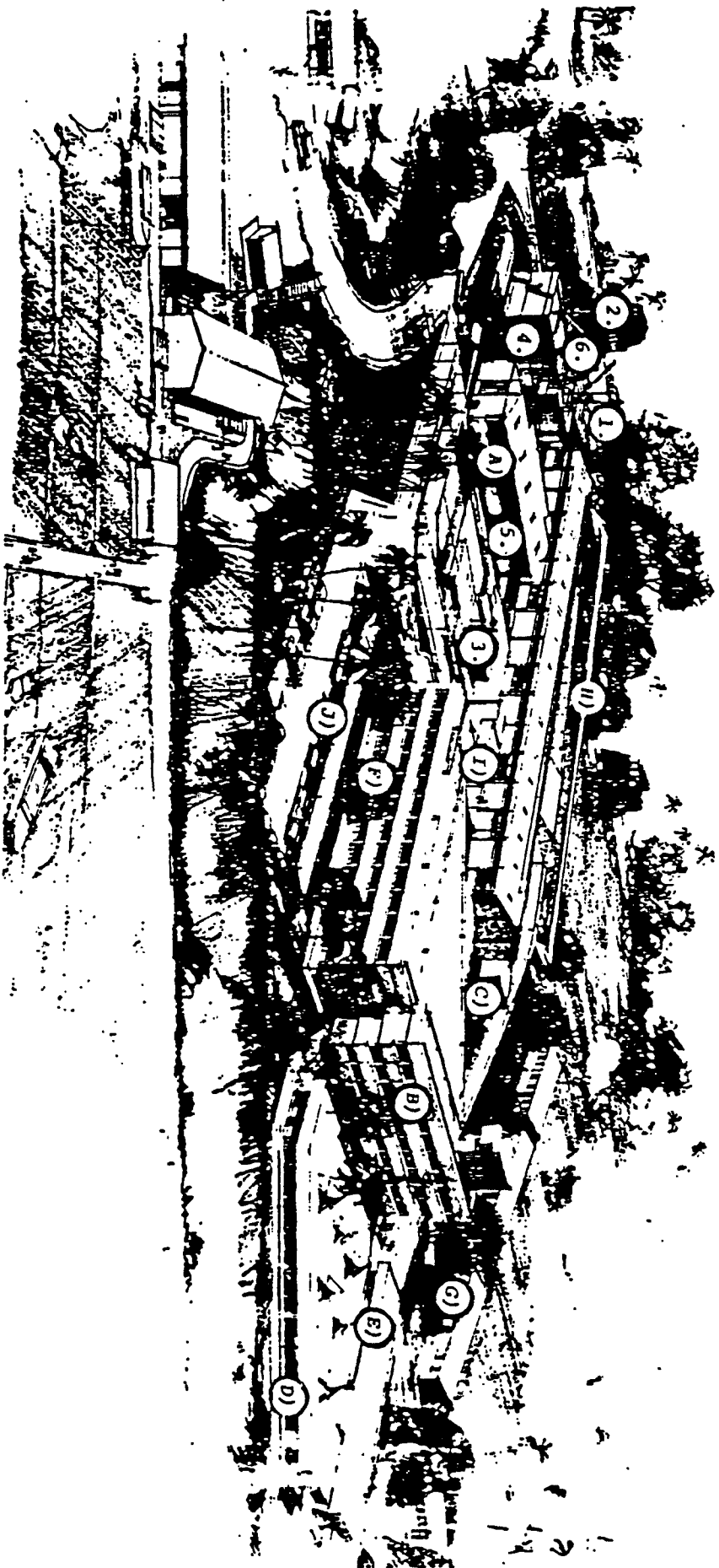
Additions or subtractions may be necessary from time to time to enhance the curriculum and these will be implemented as opportune, in the interest of both the student body and the sponsors, KENYA PORTS AUTHORITY

SECTION	1980/81	1982	1983	1984	1985	1986	TOTAL
OPERATIONS TRAINING	383	426	601	609	365	531	2915
TECHNICAL TRAINING	109	116	128	132	119	217	821
MANAGEMENT/ADMINI- STRATION TRAINING (JUNIOR/MIDDLE MANAGERS)	60	82	105	280	257	191	975
SENIOR COURSES IN PORT OPERATIONS (WITH INTERNATIONAL PARTICIPATION)	38	43	51	137	43	40	352
MARINE TRAINING	-	-	-	-	-	35	35
T O T A L	590	667	885	1158	784	1014	
GRAND TOTAL							5098

Source: Bandari College - Mombasa Training Program 1987.



# BANDARI COLLEGE



**A) MODEL SEA TERMINAL**

- 1. Working Quay cranes
- 2. Assorted winches
- 3. Fork-lift truck area
- 4. Packing & alignment
- 5. Transit shed & open storage
- 6. Mock Hatch

**KEY TO THE OVERALL VIEW OF BANDARI COLLEGE**

- B) CONFERENCE HALL & COMMITTEE ROOM
- C) AUDITORIUM & CINEMA
- D) DINING HALL for staff & students
- E) KITCHEN & REFRIGERATION UNITS
- F) ADMINISTRATIVE OFFICES
- G) HOUSING for staff & students
- H) ENGINEERING WORKSHOPS (5)
- I) MAIN ENTRANCE (as on cover)
- J) PARKING AREAS

## BIBLIOGRAPHY.

1. Bandari College Brochuer 1987.
2. Beach, Dale S. Personnel The Management of people at work. Human Resources Planning. Chapter 8 Mc. Millar Publishing Co. Inc. New York 1980.
3. C.M. Jordan. A Manpower Study Approach to the Establishment of a Maritime Education and Training System in Trinidad and Tobago. (Page 17-25) 3.
4. Erik Jacobsen Report on Tanzania Maritime Training. (Captain)
5. Joint ECA/PMAESA report on training needs and facilities for ports of Eastern and Southern Africa. (OCT.1983)
6. ILO Report No.11 on Inland Transport Committee eleventh Session, Geneva 1985.
7. Smith, A.R. Manpower Forecasting Estimating Demand for and Supply of Managers, Management Development and Training Hand book. 2nd Edition by Bernard Taylor & Gordon Lippert Mc. Graw Hill Books U.K. 1983.
8. R.I. On Wuka The Future of Regionalism in Africa. & A. Sesay
9. Waters D.M. Maritime Education and Training-Policy Objectives and Practical Considerations World Maritime University Lectures 1988.

BIBLIOGRAPHY.....cont.

10. Wilson B. The Personnel Manager, Management Skills  
Edited by W.T. Singleton MTP Press Inter-  
national Medical publications. 1981.
11. Gazetim-Panjakan NY Repoblika Malagasy 31st. Aogosi-  
tra 1974.
12. Atanasio Francisco The Development of the Mozambique  
Maritime Safety Administration to  
the Present form. page 33-39.
13. World Maritime Course of study brochure March, 1987.
14. Major issues in world shipping (A) Merchant fleet  
development. Report by UNCTAD secretariat TB/B/C/4/301  
Aug. 1986.
15. Mombasa Institute of Muslim Education brochure 1948.