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WORLD MARITIME UNIVERSITY
Malmö, Sweden

**CASE STUDY OF THE MINIMUM
REQUIREMENT FOR FOUNDING AN MET
INSTITUTE**

By

MATTHEW XYSTUS OLANGO
Kenya

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

MASTER OF SCIENCE

in

MARITIME EDUCATION AND TRAINING
(Engineering)

1996

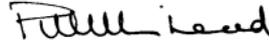
DECLARATION

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

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


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It is my pleasure to pronounce a pat on the back to John Burne, Susan Wangeeci-Eklöw and the entire WMU library staff for their services, especially in procuring, from other sources, books and other materials which were not readily available on the WMU Library shelves.

ABSTRACT

The focus of this dissertation is on the requirements to establish a maritime education and training institute, to train mariners at the support level, often referred to as ratings, and how this can be blended so that the training institute produces graduates who can satisfy the active seafaring requirements as well as those of shore based maritime related industry.

A brief visit is paid to the International Maritime Organisation's (IMO's) minimum requirements, to give an overview of what is required of seafarers serving as ratings onboard ships. a suggestion is made as to what equipment and other resources are necessary to produce graduates who meet the requirements of IMO.

In light of the technological advancements, a study has been made of maritime education and training systems in some developed countries, and how the present systems in those countries evolved from the old ones, to cope with the present technology. The countries whose MET systems are studied in this paper are Australia, Germany and Japan.

The existing facilities at the Bandari College, the suggested institution to accommodate the proposed ratings training unit, are described.

A proposed programme, giving the criteria for the suitable staff recruitment and student entry requirement is dealt with in the dissertation.

The concluding chapter examines the reasons why it is advisable to establish an MET in Kenya, and the economic impact the establishment of such an institution would have in the country. Recommendations on the need to establish an MET institution in Kenya are made, which need to be looked into by the Government's Ministry of Education and Ministry of Transport and Communications.

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List of Abbreviations

AAMTI	Association of African Maritime Training Institutes
AMC	Australian Maritime College
AMSA	Australian Maritime Safety Authority
ARPA	Automatic Radar Plotting Aid
BIMCO	Baltic and International Maritime Council
DPC	Dual Purpose Crew
FC	Facilitation Committee
GPMTTC	General Purpose Marine Technician Certificate
IELP	Intensive English Language Programme
ILO	International Labour Organisation
IMCO	Inter-Governmental Maritime Consultive Organisation
IMO	International Maritime Organisation
IR	Integrated Rating
ISF	International Shipping Federation
KFSCO	Kenya Ferry Services Company
KPA	Kenya Ports Authority
LC	Legal Committee
MARPOL	Marine Pollution (Convention)
MARSIM	Marine Simulation and Ship Manoeuvrability
MEPC	Maritime Environment Protection Committee
MET	Maritime Education and Training
MO	Maritime Officer
MSA	Maritime Safety Administration
MSC	Maritime Safety Committee
NMITC	National Maritime Industry Training Committee
OECD	Organisation for Economic Co-operation and Development
PMESA	Port Management Association of Eastern and Southern Africa
SM	Ship Mechanic
SIDA	Swedish International Development Agency
SOLAS	Safety of Life at Sea (Convention)

SOO	Ship Operating Officer
STCW	Standards of Training, Certification and Watchkeeping
TCC	Technical Co-operation Committee
UK	The United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
WO	Watch Officer
WMU	World Maritime University

CHAPTER 1

INTRODUCTION

Presently in Kenya the demands for highly trained personnel in the maritime sector at a National level is almost non-existent. The maritime training activities carried out by the Kenya Ports Authority's (KPA) Bandari College are tailored to suit and meet mostly the internal needs of the KPA.

The Bandari College is in fact an in-house training unit of the KPA. It was conceived and constructed by the defunct East African Harbours Corporation. The demise of the East African Community brought about the split of the Corporation into Tanzania Harbours Authority and the Kenya Ports Authority, in 1977. The Corporation's assets in Kenya were taken over by the KPA, including the Bandari College. It was established with the objectives of training the staff of the KPA in the basic principles and techniques of cargo handling, operation and maintenance of cargo handling equipment and marine crafts (Tugs, Pilot and Mooring Boats). It has started expanding its activities and now it offers a Diploma Programme in International Freight Forwarding.

So the conspicuous lack of a National Maritime Educational and Training (MET) institution in Kenya is a clear pointer to the fact that maritime training at any level, has been relegated to the lower order of priorities. The major reason for this may be because Kenya does not have an established National Shipping Line, nor does she have a large fleet of ships in her Register. There are no large ships of more than 1600 gross registered tonnage in the Kenyan Register of ships, and the ships operate

mainly within the coastal trade. Seamen serving on board these ships have satisfied the needs of the owners, therefore the demand for international standards has not been appreciable.

Nearly all the Kenyan marine officers serving on other foreign registered ships have had to go abroad for their training and qualifications (Certificates of Competency), mostly in the United Kingdom (UK).

Kenya having deposited the documents for ratification/ accession to the Convention on Standards of Training Certification and Watchkeeping for seafarers 1978 (STCW 1978) in 1993, became party to the Convention and any subsequent revised versions of the Convention, should such revised versions come into force either by "Tacit Acceptance" principle or through the laid down processes as per the regulations in force. Therefore the Provisions and Regulations concerning Certification of seafarers shall apply to Kenyan seafarers. For this reason the Kenyan Government must give serious consideration to training and certification of the Kenyan seafarers to the International Standards as required in the STCW Convention.

The fact that the ships are growing bigger in tonnage and becoming faster due to technological developments, means that, for a given time, the volume or tonnage of sea-borne trade which used to be satisfied by the use of, for example, five ships, can now be adequately served by three ships. Consequently the employment opportunities in the two redundant ships are lost. The unemployment scenario is further adversely affected by the fact that, even the smaller number of ships in service, have a reduced capacity each for full crew compliment. Again we attribute this to advanced technology, resulting in mostly automated ships.

Nevertheless, a world survey carried out by International Employment Research; Warwick University on behalf of Baltic and International Maritime Council

(BIMCO) and International Shipping Federation (ISF) compiled as "ISF/BIMCO Worldwide Study On The Supply And Demand Of Seafarers" in 1990, predicts that approximately 35,000 newly qualified ratings will be required each year to achieve and maintain a balance between supply and demand in the maritime sector, world-wide.

However, this study report has now been superseded by the report in the latest "BIMCO/ISF 1995, Manpower Update" which was compiled in December 1995, and deals with *The World-wide Demand for and Supply of Seafarers*.

In the report, it is evident that the Organisation for Economic Co-operation and Development (OECD) countries, when considered as one geographical group, has experienced a decline of seafarers, in both officer and rating category between 1990 and 1995. This is as a result of wastage outweighing inflows or recruitment and training during the period in consideration. On the other hand, the opposite is the case for the Far East and Indian sub-continent group, where new entrants outweighed wastage for the same period, especially for ratings in the Far East and officers in the Indian sub-continent.

Figure 1.1 and figure 1.2 indicate the world supply, and the world demand of seafarers respectively. In some geographical areas, the demand exceeds supply. This does not necessarily mean a shortage of seafarers in that area, since some flags demand far more seafarers than they supply, (e.g. open registers).

Other countries such as India and the Philippines supply more seafarers than actually required by their national fleets. This does not mean that companies in such countries employing their own nationals do not face recruitment difficulties, since they may face competition for the same seafarers from foreign companies.

For the OECD group there is genuine imbalance of supply and demand, as evidenced in figures 1.1 and 1.2. This is the area where nations supplying seafarers to the world market are bound to target.

Since all the non-Industrial countries with an interest in maritime activities will almost certainly be aware of the contents of the survey report, there is bound to be stiff competition for the supply of seamen to meet the world market demand amongst the nations.

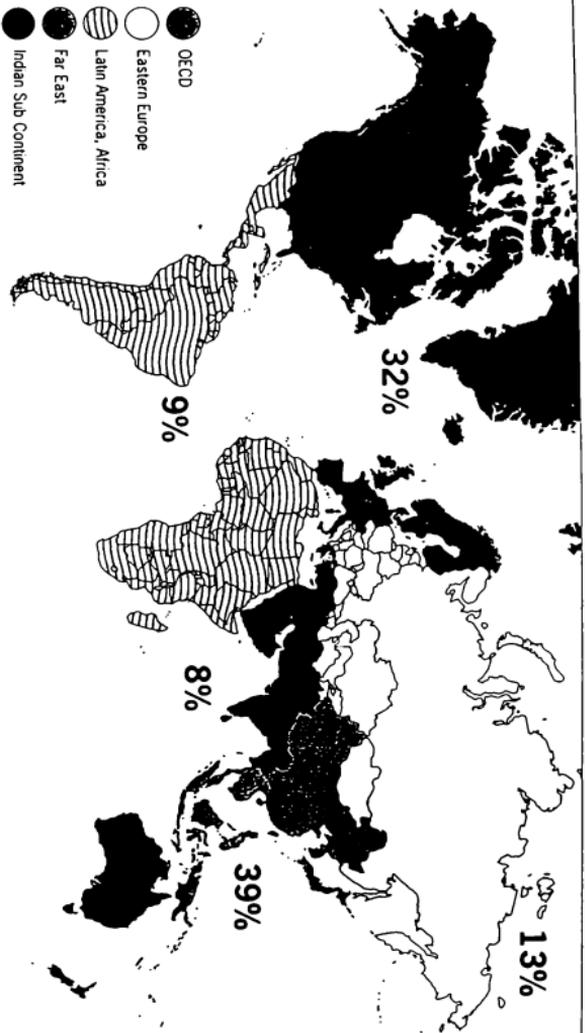
The open global market for seafarers definitely means open competition to capture the market. Should a country win the major percentage of supplying ratings globally, it is unquestionable that, that country will alleviate unemployment within her borders. This coupled with the fact that the foreign exchange earnings remitted back to the families of the seafarers will be substantial, has stimulated some developing nations into improving the quality of ratings they are producing through training. The market being competitive, the only key to win the fair competition is to be able to satisfy the customer (the ship-owner), by supplying seamen who can perform their duties competently and satisfactorily in handling the "high-tech" equipment installed in the ships of today. So well trained and qualified seamen in accordance with the provisions of the STCW Convention, if not, better, is the answer to this demand.

The Philippines has taken maximum advantage of this significant demand for well trained and qualified seamen world-wide and provides in excess of 135,000 seafarers to shipping world-wide. Other countries in hot pursuit of the Philippines include Indonesia, China, Honduras, Bangladesh and India who have also taken the advantage of supplying seamen for the crewing of foreign ships. All the above nations have managed to consistently feed the demand on the world market for ratings through developing their own internal training programmes tuned to be in line with the international standards.

Lucrative prospects of being engaged in a seagoing career which is well paid compared to salary scales in Kenya, and includes foreign travel, could attract a large number of well educated young Kenyans who are, as at now, unemployed. Alleviating unemployment in their country is every Government's wish around the world. Kenya is no exception. Therefore the authority should formulate a policy of enhancing training for those who are willing and are enthusiastic to serve in the maritime sector. The Government should support fully the proposed creation or establishment of a Rating Training Unit within the Bandari College of KPA. It would not do any harm if the Kenyan Government borrows a leaf from the other developed or developing countries already training their seafarers to the standards compatible with the STCW Convention.

The general trend of training for ratings in most developed countries, is that of multi-skilling. This is as a result of installation of high technology equipment in modern ships. which perform automatic control functions of the ships' operations. Consequently less hands are required for the modern ships' operations. Furthermore shipowners are keen on maximising profits by cutting down on operating costs. Manning cost forms the greatest percentage of operating costs for a ship. To conveniently reduce personnel, without impairing smooth running of a ship, employment of ratings who can perform deck as well as engine-room duties is the answer. This is why polyvalent training is taking preference over the traditional monovalent training in meeting the needs of modern ships.

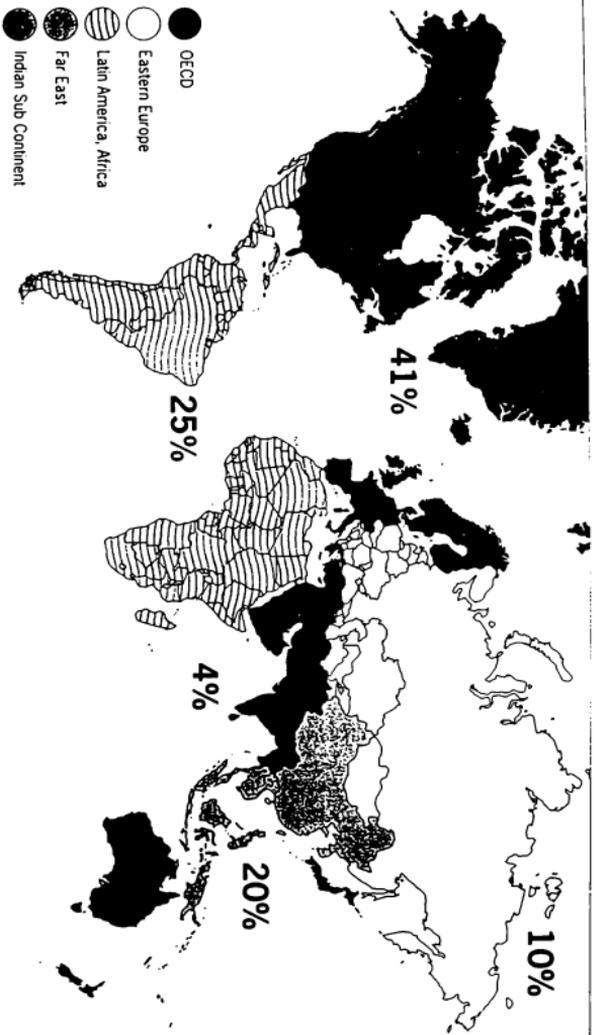
Fig. 1.1 World Supply of Seafarers, 1995



NOTES:

1. Total world seafaring supply = 1.2 million.

Fig. 1.2 World Demand for Seafarers, 1995



NOTES:

1. Total world demand for seafarers in 1995 is estimated at 1.03 million.
2. Demand figures are calculated on the basis of manning and backup requirements for all ships registered in the region, including open registers. The Latin American/African region therefore includes Liberia, Panama and other open registers. The OECD region includes Cyprus, Malta and several second or international registers.

CHAPTER 2

FOCUS ON TRAINING RELATED INTERNATIONAL INSTRUMENTS

2.1 International Maritime Organisation

The United Nations Maritime Conference convened in Geneva on 19 February 1948 adopted the Convention establishing International Maritime Organisation on 6 March 1948. It was known then as the as the Convention on the Inter-Governmental Maritime Consultative Organisation (IMCO) and was inaugurated on 6 January 1959 when it first held its Assembly Session.

The name was altered to the present name of International Maritime Organisation (IMO) following an amendment to the Convention which entered into force on 22 May 1982.

This specialised agency of the UN consists of the main Governing body , the Assembly, which consists of all member states-151 members at as now . The Assembly meets once every two years.

Between the sessions of the Assembly the Council which is composed of 32 member states elected by the Assembly , acts as the IMO's governing body , with limited powers. Most of the work of the Council is carried out in its five main committees and a number of sub-committees.

The five main committees of the IMO are:-

- Maritime Safety Committee (MSC)

- Maritime Environment Protection Committee(MEPC)
- Technical Co-operation Committee (TCC)
- Legal Committee (LC)
- Facilitation Committee (FC)

The purpose of the Organisation apart from providing machinery for co-operation among Governments in the field of regulations and practices concerning shipping , is also to encourage Governments to adopt the highest practicable standards in matters concerning maritime safety , efficiency of navigation and control of marine pollution from ships . In short the IMO's motto in common parlance is "Safer ships and cleaner oceans"

Consequently to realise its aims , the IMO has created a number of conventions and protocols. Since the top priority of the IMO is the development of global standards for maritime training in order to achieve high standards of seamanship. This led to the development of the Convention on Standards of Training, Certification and Watchkeeping for seafarers, 1978 (STCW 78). In this convention and its subsequent amendments , the minimum standards of education and training are laid down.

2.2 World Maritime University

Due to the fact that most of the developing countries face serious shortage of highly trained maritime personnel in the fields of training and safety administration , an idea was hatched at the IMO to establish a World Maritime University.

Resolution A. 501(XII) was adopted by the IMO in 1981 which requested the then Secretary General to support the establishment of a World Maritime University.

This idea was realised by the inauguration of the World Maritime University in Malmö , Sweden in 1983. The university presently offers two- year courses leading to awards of Master of Science degrees in ; General Maritime Administration and Environment Protection (GMPE) ; Maritime Education and Training , Nautical and

Engineering Streams (MET- N/E) ; Maritime Safety Administration , Nautical and Engineering Streams (MSA- N/E)

Port Management Commercial and Nautical Streams (PM - C/N) ; Shipping Management Commercial and Technical Streams (SM- C/T) .There is also a limited number of students with certain qualifications which allows them to join the WMU on a one year programme leading to awards of Master of Science degrees in their respective disciplines .

At the WMU , the teaching medium is the English language .In view of the fact that some students come from developing countries where English is not in everyday use , the University offers an Intensive English Language Programme (IELP) , designed to bring the concerned student's English knowledge to a level that ensures effective learning at the WMU. The IELP is only offered to the students on the two year courses , and it is divided into two parts . Part I is an 18-week course for students of intermediate level knowledge of the English language use . Part II is a 10-week course for those with a higher level of English Language knowledge than the ones joining the 18-week course .

In addition to the lectures delivered by the University's academic staff ,the students enjoy the fortune of exposure to visiting professors with their invaluable knowledge in their fields of speciality . This is complemented by field trips to institutions and organisations in various developed countries .

The WMU is governed by a Board of Governors , while the day to day academic and administrative functions are performed by the resident academic and non-academic staff , under the leadership of the Rector deputised by the Vice-Rector and supported by non-academic staff.

2.3 STCW 78 Convention

The Convention was ratified by Kenya in 1993. Basically the Convention was developed to establish, globally, a uniform minimum level of competence, in education and training of seafarers.

However, there has not been any sufficient guarantee to ensure that the STCW requirements have been met and implemented world-wide. This is mostly due to the fact that each contracting government was permitted by the provisions of the above Convention, Article VI, to issue certificates of competence to the candidates who satisfy their own interpretation of the Convention. Consequently there has been non-uniform minimum level of competence globally.

Real concern for lack of uniform minimum level of competence world-wide, fuelled by the recent much published maritime casualty incidents, resulted in IMO Secretary General initiating a revision of the above Convention in conjunction with the International Labour Organisation (ILO), since ILO is the body responsible for global standards pertaining to seafarers' service.

The adoption of the revision of the STCW Convention took place at an IMO Diplomatic Conference in July 1995. A notable feature of the revised version of the Convention is the adoption of a new STCW Code, to which many technical regulations have been transferred. The STCW Code is quite an elaborate document divided into two parts. Part A of the Code is mandatory whereas Part B is recommended.

Principal dates relevant to implementation of the revised Convention are:

- 1 February 1997- The 1995 amendments to the STCW Convention will enter into force.

- 1 August 1998 -New Entrants commencing training will be required to do so according to the newly adopted standards.
- 1 February 2002 - All other transitional measures will end.

2.3.1 Revised STCW (STCW-95)

The revised STCW Convention which is identified as STCW-95, is comprised of :

(i) **Seventeen** articles like its predecessor, the STCW-78. Article I gives a summary of the of the general obligations under the Convention, whereas the other sixteen deal with other matters which include relevant definitions, applications, communications of information among others.

(ii) **Fourteen** resolutions, including an Annex of Regulations divided into 8 Chapters as opposed to the STCW- 78, which was divided into only 6 Chapters. Resolution 2 is in form of attachment of STCW Code, and is divided into two parts, viz.

- **Part A** containing mandatory requirements, which all governments that are Parties to the Convention will have to implement.
- **Part B** containing recommendatory guidance, parts of which many governments may however treat and apply on a mandatory basis.

General obligations under the Convention as contained in Article I is as reproduced below for easy reference.

(1) The Parties undertake to give effect to the provisions of the Convention and the annex thereto, which shall constitute an integral part of the Convention. Every reference to the Convention constitutes at the same time a reference to the annex.

(2)The Parties undertake to promulgate all laws, decrees, orders and regulations and to take all other steps which may be necessary to give the Convention full and complete effect, so as to ensure that, from the point of view of safety of life and property at sea and the protection of marine environment, seafarers on board ships are qualified and fit for their duties.

2.3.2 Mandatory Minimum Requirements

The mandatory minimum requirements to be observed in compliance with the Convention are contained in the annex of regulations mentioned on sub-chapter

2.3.1. The 8 Chapters of the annex are as follows:

2.3.3 Chapter I (General Provisions)

This chapter covers the legal matters pertaining to the Convention. It is sub divided into 15 Regulations.

Regulation I/1 gives 'Definitions and clarifications'.

Regulation I/2 elaborates on 'Certificates and endorsements'.

Regulation I/3 deals with 'Principles governing near-coastal voyages'.

Regulation I/4 explains 'Control procedures'.

Regulation I/5 talks about 'National provisions'.

Regulation I/6 stresses to the parties requirements on 'Training and assessment" in accordance with the provisions of section A-I/6 of the STCW code.

Regulation I/7 deals with 'Communication of information'.

Regulation I/8 draws attention of the parties to section A-I/8 of the STCW Code with regards 'Quality standards'.

Regulation I/9 is about 'Medical standards -Issue and registration of certificates'.

Regulation I/10 is on 'Regulation of certificates'.

Regulation I/11 touches on continued professional competence in accordance with section A- I/11 of the STCW Code. Thus sub headed "Revalidation of certificates".

Regulations I/12 "Use of simulators" shades light on simulator- based training among other things.

Regulation I/13 "Conduct of trials". Specifies the authority an Administration has regarding sea trials by ships within the Administration's jurisdiction.

Regulation I/14 "Responsibilities of companies." The Convention's provisions put the onus of proper crewing of ships on the companies, as in section

A- I/14 of the STCW Code.

Regulation I/15 "Transitional provision." Before 1 February 2002, when each party is expected to fully comply with the revised STCW Convention, there are practices which can be continued that applied to the STCW-78.

2.3.4 Chapter II (Master and Deck Department)

This Chapter has four mandatory Regulations as quoted below:

Regulation II/1 "Mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnage"

Regulation II/2 "Mandatory minimum requirements for certification of masters and chief mates on ships of 500 gross tonnage or more"

Regulation II/3 "Mandatory minimum requirements for certification of officers in charge of a navigational watch and of masters on ships of less than 500 gross tonnage"

Regulation II/4 "Mandatory minimum requirements for certification of ratings forming part of navigational watch"

2.3.5 Chapter III (Engine Department)

For engine department the mandatory requirements are also stated in four regulations quoted below:

Regulation III/1 “Mandatory minimum requirements for certification of officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room”

Regulation III/2 “Mandatory minimum requirements for certification of chief engineer officers and second engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more”

Regulation III/3 “Mandatory minimum requirements for certification of chief engineer officers and second engineer officers on ships powered by main propulsion machinery of between 750 kW and 3,000 kW propulsion power”

Regulation III/4 “Mandatory minimum requirements for certification of ratings forming part of a watch in a manned engine-room or designated to perform duties in a periodically unmanned engine-room”

2.3.6 Chapter IV (Radiocommunication and radio personnel)

This has only two regulations viz.

Regulation IV/1 “Application”

Regulation IV/2 “Mandatory minimum requirements for certification of GMDSS radio personnel”

2.3.7 Chapter V (Special training requirements for personnel on certain types of ships)

The chapter has two mandatory regulations on minimum requirements.

Regulation V/1 “Mandatory minimum requirements for the training and qualification of masters, officers and ratings on tankers”

Regulation V/2 “Mandatory minimum requirements for the training and qualifications of masters, officers, ratings and other personnel on ro-or ships”

2.3.8 Chapter VI (Emergency, occupational safety, medical care and survival functions)

There are four mandatory regulations namely:

Regulation VI/1 “Mandatory minimum requirements for familiarisation, basic safety training and instruction for seafarers”

Regulation VI/2 “Mandatory minimum requirements for the issue of certificates of proficiency in survival craft, rescue boats and fast rescue boats”

Regulation VI/3 “Mandatory minimum requirements for training in advanced fire fighting”

Regulation VI/4 “Mandatory minimum requirements relating to medical first aid and medical care”

2.3.9 Chapter VII (Alternative certification)

There are three regulations pertaining to this chapter.

Regulation VII/1 “Issue of alternative certificates”

Regulation VII/2 “Certification of seafarers”

Regulation VII/3 “Principles governing the issue of alternative certificates”

2.3.10 Chapter VIII (Watchkeeping)

This chapter deals with two regulations

Regulation VIII/1 “Fitness for duty”

Regulation VIII/2 “Watchkeeping arrangements and principles to be observed”

CHAPTER 3

ANALYSIS OF CURRENT RATING'S TRAINING SYSTEMS IN SOME DEVELOPED COUNTRIES

3. 0 Rationale For Analysis

The Ministry of Transport and Communications in the Kenya Government requested technical assistance from the International Maritime Organisation (IMO) to enable the Government to establish a Maritime Training Institute for ratings.

In response, the IMO sent Captain Eric Moat (the IMO's Inter-regional Sectorial Support Consultant) to Kenya in 1991, to review and assess the maritime training in Kenya and give assistance to the Government in meeting technical requirements for ratification of the International Convention on Standards of Training Certification and Watchkeeping for Seafarers 1978 (STCW '78)

The consultant compiled a detailed project report entitled "Rating's Training School", recommending to the Kenya Government the need of establishing a Rating's Training Unit within the Kenya Ports Authority's (KPA), Bandari College, after identifying that the Bandari College was the only institute in Kenya which offered some maritime training tailored to meet the KPA's internal needs.

The Bandari College could be upgraded, with the acquisition of relevant facilities, to an institute for training ratings to national and international standards.

After studying the consultant's report, the Ministry replied positively to the IMO acknowledging their acceptance of the recommendations and requested further assistance in the realisation of the project.

This forms the basis for studying current different Ratings training systems in some developed countries. Since the Kenya Government is willing to realise the establishment of a Ratings Training School, it would be useful to learn what is done in well established institutions and see what ideas can be borrowed in trying to establish one, then gradually develop it.

3.1 Modern Training Of Seafarers In Different National Systems

Ship technology and ship operations have undergone radical changes in recent years. This trend is now accelerating as various high-technology developments in ship controls, communications and data processing are introduced on board ships. In the past, ship technology development had been slow.

The rapid changes have introduced new demands on ship operations which will equate well with manning efficiency. This manning efficiency can only be achieved through equally efficient training of seafarers to match the new challenges ushered in by the technological developments.

In response to the ever changing technological advancements and inventions, coupled with the international instruments' requirements for the minimum qualifications to handle modern equipment installed on ships of today, many developed countries set up the machinery to develop, in some cases, restructure training programmes to meet the demands.

Accidents and other maritime disasters have always been attributed to human- factor. In the author's view, what this means is that the human in charge at the time of any mishap must have had lack of proper training. To minimise this, training in many countries has been revitalised accordingly.

The IMO's Convention on the Standards of Training, Certification and Watchkeeping for Seafarers 1978 (STCW '78), which has since been revised , has some guidance which, when followed, will undoubtedly go a long way in harmonising standards and quality of trained personnel adhering to the Convention's mandatory and non-mandatory recommendations.

Some developed countries have in their training systems, much higher qualification requirements for a particular rank, than is asked for in the STCW '78. This equally gives the trained persons in those countries excellent opportunities for higher education.

Considering the reduced manning due to automation of ships, the trend in the developed world is now to train crews who are able to work both on deck and in the machinery space. These are known as "dual-trained" or "integrated" crew. So some countries have assimilated in their systems:

- A scheme for dual training in their Maritime Education and Training (MET) institutions.
- Same basic training for both officers and ratings.

The above is manifested in countries such as Japan, Australia and Germany, with slight variations. Australia, being the only country mandating that basic Integrated Ratings' training be followed by both officer and rating trainees.

3.2.0 An Overview of MET Systems For Ratings

Different countries have varying approaches aimed at the achievement of the common goal in shipping circles. That is to produce efficient and reliable crews to be deployed on board their sophisticated ships in conformity with the International requirements. The ratings training systems of Germany, Australia and Japan will be described in the following sections.

3.2.1 Maritime Training For Ratings In Germany

Information about the Ratings training system in Germany was received from Captain Burkhard Rahn, the Headmaster of Schleswig-Holsteinische Seemannsschule, in Travemunde, Germany, during a field-study visit made by the writer in 1995.

In the late seventies, a Committee was formed with the German authority responsible for maritime vocational education, the ship owners' Association and the Unions being represented. Also in attendance were the maritime education and training experts.

The objective of the Committee was to find a solution to the question of how to train and educate seafarers for operations of high technology ships of the future, to serve adequately both on deck and in the engine room, undertaking duties relevant to their status and qualifications.

After some years of debating, they settled for a multi-purpose training programme in the German MET systems. This saw the introduction of the programme in 1983, leading to an end product of a multi-purpose rating known as "Ship Mechanic" on passing the required examinations.

3.2.2 Ship-Mechanic Training Module

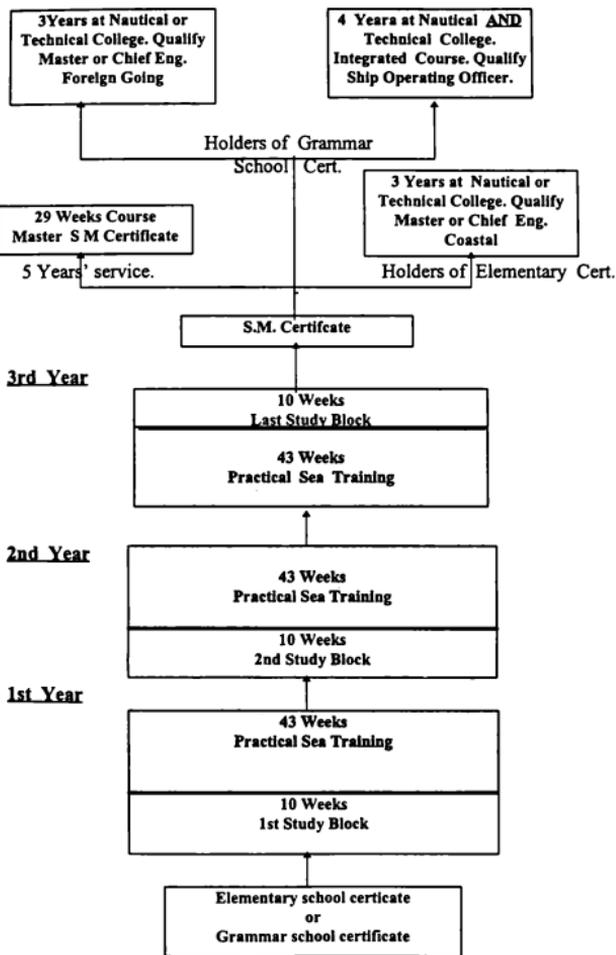
The intake academic level requirement for entry to the Ship-Mechanic course, is either elementary school or secondary grammar school certificate. The apprentices are required to sign a contract of at least three years with a shipping company. This is because the ship-owner will have to pay the apprentices allowances and also meet the full board expenses of the apprentices in the vocational schools, since all the vocational schools are full-board institutions, while the Government pays the tuition fees.

At the institution, the first year apprentices spend the first ten weeks learning basic metalwork and workshop technology, basic techniques of watchkeeping in both machinery space and the bridge, personal safety, including life-boat drills and survival at sea and basic fire fighting. After that, the apprentices go to sea for the rest of the year.

The second year is divided in the same format, in that, the second year apprentices go back to the institute for more advanced learning of what they had learnt in the first year, for again a period of ten weeks.

This culminates in an intermediate examination, with awards of certificates to successful apprentices in fire-fighting and personal survival, in accordance with the German national regulations and of course the STCW convention. The apprentices then go back to sea for the rest of the year.

Figure 3.1 Diagrammatic Presentation Of Ship-Mechanic Training.



The sea service which starts after the first ten weeks of the second year, is continued into the third year, with the last ten weeks of the year again spent at the vocational school in preparation for the final examinations. The successful candidates are then issued with "Ship-Mechanic" (SM) certificates from the Ministry of Transport. See fig. 3.1. above.

For the Ship-Mechanics with the ambition to achieve higher qualifications, there are a number of options at their disposal, depending on the basic education standard at the time of joining the course. The options are as follows.

-The SM can opt to become a Master Ship-Mechanic. In this line the SM will have to serve as a SM for five years to be eligible for enrolment at a Master Ship Mechanic school for a twenty nine week course before finally sitting for relevant Master SM Certificate examinations

-A second option is for the SM's with elementary school certificates, who wish to hold Chief Engineer's or Master's Certificate for coastal voyage ships with limitations to propulsion power or tonnage respectively, as is stipulated in the STCW Convention. They can join an approved Technical or Nautical College for three years to undertake relevant courses to their intended careers.

-Third option is exclusively for the SM's with at least grammar school certificates. They can join an approved Nautical or Technical College to pursue a three year course to qualify as Master or Chief Engineer (Foreign Going).

-Fourth option applies to SM's who are grammar school certificate holders who wish to be multi-purpose officers on board. They can join any College offering integrated officer's course like the Hamburg Nautical and Technical College. The prospective

integrated officer will take an appropriate four year course, with the successful multi-purpose ship's officer qualifying as "Ship Operating Officer"(SOO).

3.2.3 Summary Description Of Ship-Mechanic Training

Prerequisite For Entry.

1. Education Level

- a) Elementary school leavers- 9th year grade.
- b) Secondary grammar school certificate.

2. Qualified students must be attached to a shipping company.

3. Medical Fitness:

All aspiring candidates must undergo medical check of:

- a) Eye sight and colour blindness.
- b) Hearing.
- c) Chest X- Rays.

Course Structure

There are three college study/lecture blocks of ten weeks each at the vocational school, undertaken over a three year period, sandwiched by practical at sea training.

1st Study/lecture block	10 weeks
Practical sea training (deck/engine room)	43 weeks
2nd Study/lecture block (intermediate exams)	10 weeks
Practical sea training	86 weeks
3rd -Final study/lecture block	10 weeks

Vocational School Learning Hours.

Safety related subjects	132 hours
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Deck machinery/cargo handling equipment	40 hours
Marine engineering	250 hours
Ship handling	40 hours.
Total hours of learning at school/study block	462 hours

Certification Awarded.

Ship-Mechanic Certificate from the Ministry of Transport.

Options For Higher Qualifications.

There are four routes to achieve higher qualifications, once one has qualified as a SM. They are outlined as follows:

- a) Enrol at a Master SM school for a twenty-nine week course, after serving for 5 years as a SM. A Master SM certificate is awarded to successful candidates.

- b) SM's holding elementary school leaving certificate can enrol at a Nautical or Technical College for a three year course leading to awards of a Coastal ship Master's Certificate or Chief Engineer's Certificate (Gross Tonnage and Propulsion Power Limitations) in accordance with regulations in force.

- c) SM's with grammar school certificates can either:
 - i) Enrol at a Nautical or Technical College for a three year course leading to either Master's (Foreign Going) Certificate or Chief Engineer's Certificate for vessels of more than 3,000 kW Propulsion Power.

OR

- ii) Enrol at a Nautical and Technical College offering a bivalent (dual purpose) course for four years leading to an award of "Ship Operating Officer" (SOO)

Certificate to enable the successful persons to serve as either a Navigating or Engineer Officer.

3.2.4 Maritime Training For Ratings In Australia

The author learned that, Australia instituted the current system of marine training as an implementation of the recommendations of a Committee composed of Ship-owners' representatives, Union representatives and Chaired by a Government appointee Sir John Crawford. The committee was constituted and held its deliberations in the early 1980's. Their recommendations were introduced to the maritime education system in Australia, in 1984. Quarder (1993).

There is emphasis on training every member of the crew, officers and ratings alike, on matters of self as well as ship's safety. To promote safety of everyone on board, team work as well as cordial relations between officers and ratings is of paramount importance and must exist. As such, the Australian training programme has been designed to allow early interactions of would be officers and would be ratings at the nascent stage of their training.

3.2.5 The Integrated Rating Training

The Australian Maritime College (AMC), Handbook 1995, details that, all persons embarking on a seafaring career in the Australian Merchant Marine must now undergo a common initial training period by completing an Integrated Ratings Course at AMC.

The Course is broken down as follows:

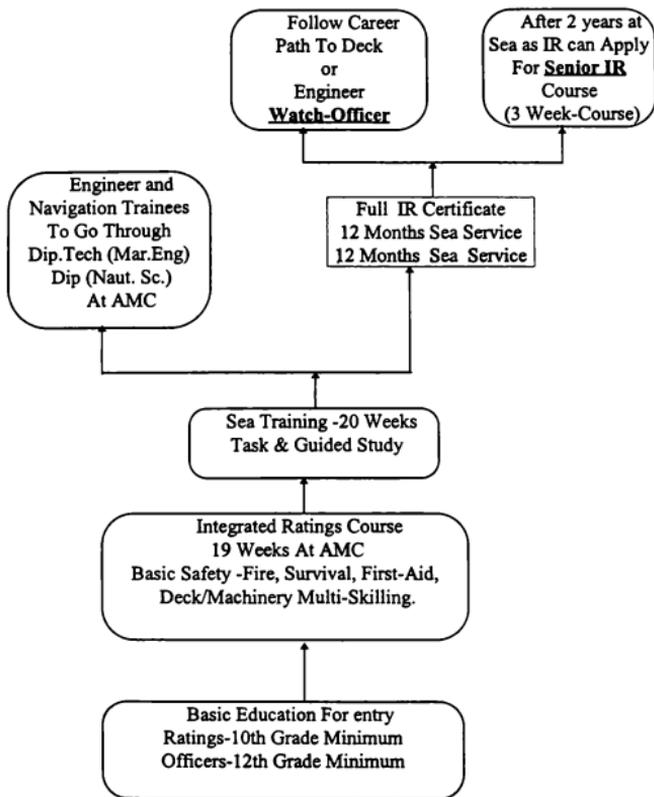
- 3 Weeks pre-sea training which includes, inter-alia, Shipboard safety, Survival at Sea, Fire-Fighting and First Aid.
- 16 Weeks vocational training , learning skills one would need to satisfactorily perform Deck or Engine-Room tasks.
- 20 Weeks Sea Service, during which the trainee undertakes specified Tasks and Guided Study.

On completion of the 39 weeks' training successfully, the trainees are awarded Certificate in Marine Operations (Integrated Rating) by the AMC, which entitles one to a Provisional Certificate as an Integrated Rating (IR) issued by the Australian Maritime Safety Authority (AMSA).

All first year cadets (officer trainees) pursuing seafaring careers as either Navigating or Marine Engineer Officers, who have enrolled in Diploma of Applied Science (Shipmaster) and Diploma of Technology (Marine Engineering) respectively, have the course as part of their programme. This is extended to the under graduate first years enrolled in Bachelor of Technology (Marine Engineering) as well as those enrolled in Diploma of Applied Science(Nautical Science).

The successful trainees in the Integrated Ratings Course, and hwo are holders of the Certificate in Maritime Operations (AMC Award) -(Provisional Certificate as IR-AMSA) , but are without the necessary basic education background to qualify as officer trainees, can serve as IR at sea for 12 months to obtain a full IR Certificate from the AMSA

Figure 3.2 Diagrammatic Presentation Of IR At AMC



Once one obtains the full IR Certificate from AMSA, there are two ways open to upgrade one's qualifications.

i) One option is to pursue a career as a Senior IR. This entails a two year sea service as a fully certificated IR, before being eligible for application to National Maritime Industry Training Committee (NMITC) for consideration to join the Senior Integrated Rating Course. This is a three week course which includes a one-week Advanced Fire-fighting course.

b)The second option is to pursue a watch-officer's career, as either Navigation or Engineer watch-officer. In this option the full IR can first enrol for a Correspondence Education/(Distance Learning) for three months, then attempt a test at the end.

The successful ones can go to the next stage, which is a six month's preparatory study in either Deck or Engine discipline, with a test at the end.The candidates who meet the NMITC pass mark are then sponsored to the AMC to enrol for watchkeeping officers course, in either Deck or Engine Room Department.

3.2.6 Summary Description Of IR Training

Prerequisite For Entry.

1 Education Level.

a) Ratings trainees must complete a minimum of 10th grade with good results in maths and English.

b) Cadet Officers must have a minimum of 12th grade with good passes in Science subjects.

2. The applicants should be able to demonstrate, in the second semester their ability to achieve sea going experience.

3. They should be sponsored by industry.

4 Meet Statutory Health Requirements.

Must undergo thorough medical checks like:

- a) Eye sight and colour blindness
- b) Hearing
- c) Chest X-ray.

The Course Structure At AMC

Duration: 19 Weeks at AMC

20 Weeks at Sea

Semester I (At College)

Survival at Sea	43 Hours
Shipboard Safety & The Shipping Industry	56 Hours
Fitting And Machining	132 Hours
Welding and Thermal Cutting	67 Hours
Maintenance	30 Hours
Marine Operations	132 Hours
Marine Machinery Systems	120 Hours
Rigging Technology	38 Hours
Communication	<u>20 Hours</u>
Total	638 Hours

Semester II (At Sea)

Task and Guided Study

160 Hours

Total for both semesters

798 Hours

Certification Awarded

- a) Certificate in Marine Operations from AMC
- b) An IR provisional certificate from AMSA
- c) Further sea service of 12 months as holder of the above certification, qualifies for full IR certificate from AMSA.

Options For Higher Qualifications

The IR's with ambition and drive for higher ranks, but who do not have the 12th grade certificate to qualify as officer trainees, have two channels to follow. These are:

- a) Enrol for senior IR after 2 years' service as a holder of full IR certificate.
3-Weeks Course
- b) Follow a career path for Deck or Engineer Watchkeeping Officer.

3.2.7 Maritime Training For Ratings In Japan

Ishida (1996) in his lectures and notes at the World Maritime University (WMU), has made it clear that the economic forces due to a lack of maritime trade in the mid-seventies, reinforced by extra high cost of recurrent expenditure-(salaries and wages of seafarers due to the appreciation of the Japanese Yen), led to a considerable decline in the Japanese shipping industry. Japanese were ships reduced to a mere one-quarter of the world total.

The Japanese were, however, determined to arrest the situation and reverse the trend of the decline. Thus a "Research Committee on Modernisation of the Seafarers' System" was formed in April 1977, to act as the advisory body to the then Director General of Seafarers' Bureau of the Ministry of Transport. The members of the Committee were representatives from the Government, Labour Union, Employers and Maritime Experts.

The objective of the Committee was to formulate a programme, that when established in their training system, would phase out the traditional clear cut division in the Deck and Engine departments, which were in existence then. Their main task was to design a programme, formulating how:

- Best the Deck and Engine departments could be trained for role reversal duties, where the deck officer could be trained to perform engineer's duties and vice-versa.
- The then monovalent ratings could be trained to perform part of officers' duties in their respective departments. This was aimed at initiating closer ties between officers and ratings in the same department.

Finally the committee came up with the idea of experimental tests and formulated a guideline entitled "Hypothetical Image of the Seafarer". This was split into two parts:

- i) Hypothetical image of the seafarer as the ideal target for the future
- ii) Hypothetical image of the seafarer during the transitional process.

The hypothesis dealing with the transitional process would require complete review for a drastic change in the existing work division between deck service and engine operation. All ordinary crew would acquire a new title of Dual Purpose Crew (DPC)

after passing through the new training scheme, biased for dual skilling. All the same they would be categorised in their specialised skills as either deck or engine room crew, as well as identified on the basis of their common skills.

The officers were to be trained adequately in both navigation and engine disciplines, and serve as watch officer (W/O) interchangeably. During this transition, the first officers for the dual service experiment were to be the lower cadre officers, then moving to the upper ranks in stages..

Stage A experiment was launched in 1981 using ships equipped with advanced automation system known as M-zero ships. At this stage conventional ratings for both deck and engine room services were replaced by 6 DPC. The lowest ranked officers, that is, third navigational and third (fourth in British system) engineering officers were replaced by a single W/O. The target was to reduce crew to full compliment of 18 people, after installing labour-saving equipment on board the M-zero ships.

Further evolution and innovation of marine technology improved automation in the M-zero ships by installation of additional labour saving equipment. The success of the experiment with the M-zero ships stimulated addition of labour saving equipment. Now the stage was set for experimental operation of ships with even further reduced crew. It became imperative to amend the laws governing the crewing of the Japanese ships. Consequently the laws were revised to specify standards for installation of modernised equipment and assignment pattern for W/O and DPC as the new type of officers and crew on board.

Further advancement with additional automatic equipment such as Automatic Radar Plotting Aid (ARPA) affected the manning level of the ships, the full ship's compliment was reduced to 16 people. At this stage a title of kW/O was introduced.

This was basically a DPC who had received more advanced training to perform junior officer's duties in addition to conventional duties as DPC. So on board the ships of 16 men crew , were 2 DPC who were kW/O eligible for assignment to either deck or engine room as W/O of Type 1 or type 2.

Type 1.: Third grade maritime officer for navigational watch

Type 2: Third grade maritime officer for engine watch.

To acquire a certificate as kW/O a holder of DPC certificate has to enrol at the Marine Technical College for a five month's course, after which sit and pass the National Examination for Third Grade certification in Navigation or Engineering, with watch limitations. This certificate satisfies regulation II/4 or regulation III/4 of the STCW.

Regulation II/4 is:

“Mandatory requirements for certification of ratings forming part of a navigational watch.”

Regulation III/4 is:

“Mandatory requirements for certification of ratings forming part of a watch in a manned engine-room or designated to perform duties in a periodically unmanned engine-room”.

3.2.8 The Dual-Purpose Crew Training

The present ratings training programme in Japan aimed at producing ratings who can be assigned both deck and engine room duties, known as Dual Purpose Crew (DPC) was introduced in 1986.

Following the success of conversion (through re-training) of the former traditional monovalent trained crew during the “Hypothetical Image of Seafarer in a Transitional Process” experimental stages, first to DPC, then to W/O and eventually

to kW/O, the Japanese Administration re-organised the training for the new entrants into the seafaring career from monovalent to dual purpose training.

The prospective ratings have two different entry points, depending on their basic formal education level. Those with the Junior High School grade can join one of the six national schools for seamen's training, to undergo a three year Regular Course, whereas those with Senior High School grade join one of the two schools for seamen's training offering one year Special Course. In each case the trainees must serve a month's sea training conducted by the Institute for Sea Training.

The successful graduates from either Regular or Special Course are awarded the DPC certificates. This qualification exempts the holders from written examinations for 4th Grade Maritime Officer (MO) Navigation or Engineering. The holders are thus qualified for corresponding oral examinations.

3.2.9 Summary Description Of The Dual-Purpose Training

Prerequisite For Entry.

1. Education Level

- a) Regular Course trainees :Junior High School leavers (9th year)
- b) Special Course trainees: Senior High School leavers (12th year)

2. Pass entrance examinations.

3. Must be Medically fit as per statutory health requirements.

Course Structure.

Regular Course: -Schooling period of 3 years including 1 month practical sea training at the Institute for Sea Training.

Special Course :- Schooling period of 1 year including 1 month practical sea training at the Institute for Sea Training.

Course Learning Hours.

	Regular Course	Special Course
General Subjects	1260 Hours	–
Technical Subjects	1575 Hours	1044 Hours
Safety Courses	210 Hours	72 Hours
Practical Training	660 Hours	216 Hours
Sea Training	<u>735 Hours</u>	<u>285 Hours</u>
TOTAL	4440 Hours	1545 Hours

Certification Awarded.

Graduates from both Regular and Special Courses are awarded the DPC certificates on passing their final examinations. This exempts holders from written examinations for 4th Grade Maritime Officer (MO), after 2 year's sea service. Thus qualifies them for corresponding oral exams only.

Opportunities For Higher Qualifications.

A Dual Purpose Crew (DPC) having served at sea for at least 3 years, can apply for re- education at the Marine Technical College to study then take appropriate National Examinations for Maritime Officer's Certificate of Competency for Third Grade.

CHAPTER 4

AN ANALYSIS OF NEEDS IN KENYA IN LIGHT OF INTERNATIONAL DEVELOPMENTS

As is evident from the above described systems of current Ratings Training in Australia, Japan and Germany, the approach employed towards the development of their respective present training systems is similar, albeit with slight variations.

Fully aware of the rapid technological developments, each of the mentioned countries' Governments saw the need to upgrade the seafarers' training systems. Accordingly each Government constituted an advisory committee to look into ways and means of how their seafarers could best keep abreast with the new technological developments through training, and advise the authorities as necessary. Hence the end result was the restructuring of their training systems.

For any national training system to be successful, it must invariably receive unwavering support from the Government, since national policy is crucial with respect to general education and training programmes in the country. This becomes more conspicuous when it comes to the training of seafarers, because there is a set minimum international standard attached to it.

To formulate the most suitable system for each of the above mentioned countries, the respective advisory committee as constituted, included Government representatives, shipowners representatives, union representatives and of course the maritime experts.

This exposed each committee to a wide spectrum of suggestions and views which was sifted through and pros and cons exhaustively debated, ending with a final well balanced system to be introduced to meet their immediate and long term needs, nationally and internationally.

Similarly Kenya needs to involve all parties with an interest in the maritime sector, and set up a committee to plan and advise the Government on a training programme which will satisfy internal national needs and be compatible with international requirements.

As mentioned in Chapter 1, Kenya does not have an MET institution at the moment catering for national, let alone international needs. The only maritime college of some significance, is the Bandari College. Unfortunately it was designed to meet the immediate needs of the Kenya Ports Authority (KPA) exclusively.

It is therefore imperative for the Kenya Government to demonstrate total commitment to their acceptance of the recommendations given by the IMO Inter-regional Sectoral Support Consultant in Maritime Training, Capt. Eric Moat, as stated in the letter to the Secretary General of IMO, Mr. W. A. O'Neal, from the Kenya Government Ministry responsible for maritime affairs. The relevant part is reproduced below:

“This Ministry is satisfied that the project was well undertaken and the recommendations are in line with our needs. We therefore further request IMO to give the necessary assistance in implementing the recommendations as advised and that Capt. Eric Moat be given a chance to come and discuss with the Ministry officials and Kenya Ports Authority on the modalities of implementation of the report.”

The document is reproduced in full in Appendix A.

This calls for a quick follow up, and the first step now is for the Kenya Government to take the initiative and form an advisory committee comprising selected officials from the Ministry of Transport and Communications, and the Ministry of Education to represent Government interests. These should team up with representatives from the KPA, seamen's union and shipowners, even though Kenya has only a few registered ships. Being a developing country Kenya does not have a well established maritime sector and there are not many Kenyan maritime experts. So the Government should seek the services of external experts to complete the formation of the advisory committee, through IMO.

The so formed advisory committee may have a critical look at the different systems, which of course have proved successful in meeting the IMO's STCW Convention requirements. The committee can compare then select the one which can be more easily adopted with little modification to suit the resources available in Kenya. The Australian system stands out to be the easiest one for Kenya to adopt because of the nature of the formal school education in Kenya and of course the Commonwealth background of the two nations. Considering the limited resources in Kenya, the continuous full-time theoretical/academic learning and practical training at the MET Institute would benefit the trainees while negotiations are going on to find ships for sea-service placements. With skills acquired during the full-time training at the institute, the trainees can be put to good use in serving any of the several private sectors having demands closely related to those in the maritime sector, before ships are found for them. The Government through diplomatic channels can seek expert advice from the Australian authorities or they can even co-opt the Australian experts onto the advisory committee.

Planning needs cannot be over-stressed because it is common knowledge that technological changes and advancements are the order of the day. Training

programmes must therefore be geared to these changes otherwise there is the danger of producing trained graduates fit to serve in the ships of the past which are being phased out, but are unfit for service in the modern ships. This obviously will be an unworthy investment. So there is great need for planning the Kenyan training system to fit in smoothly with formal education received in secondary schools. The training programmes should be based on the forecast of the future technological changes.

The re-designing of training structures in the previous Chapter resulted from the impact of changes in science and technology. The domino effect of technological development on training is self evident. For effective training in line with new developments to be realised, the existing training institutes have had to replace their obsolete equipment with modern ones. Those which have not done so, must plan to do so immediately. On introducing new equipment, there must be trained qualified personnel to adequately use them to train the trainees. This means training the trainers on how to handle the equipment as teaching /learning tools as well as care for and maintain the equipment effectively, to ensure long service. There is need for the training of qualified mariners in Kenya (those holding Master Mariner's or Mate's Certificates Foreign-Going and Chief Engineer's or 2nd Engineer's Certificates- for ships of 3000 kW or more) as teachers for professional subjects in an MET institute. They should learn teaching pedagogics and be duly certified teachers. Further to that, they should be trained in operating techniques on any new equipment the MET institute might acquire, such as simulators, ARPA equipment, computers, etc. This will equip and arm them fully in readiness for their intended duties as trainers.

The training of trainers (lecturers/instructors and technicians) in specialised fields which require overseas training, because of lack of facilities locally, (for example training on simulators) could be procured, with assistance from donor countries, or through soft loans negotiated by the Kenya Government, or in the form of technical

assistance from any international agency such as IMO, United Nations Development Programme (UNDP), Swedish International Development Agency (SIDA), etc. The dependence on foreign aid could be reduced if the KPA is directed to meet the costs of training a limited number of prospective teachers/instructors. After all, most of the qualified Kenyan mariners holding U.K. certificates of competency are in the KPA employment as either Marine Pilots or Dockyard Marine Engineers.

A training institute would be incomplete without appropriate facilities to achieve the training goals and objectives. This identifies the need to review the existing facilities at the Bandari College and upgrade or acquire new ones, as necessary, to make the intended training activities possible. Consideration should be made with respect to adequate space availability, equipment, standard class/lecture rooms with chairs and desks, workshops and laboratories. Where there is a short-fall, plans for acquisition must be made and interim alternative arrangements made for the training to take-off. For example the survival at sea "wet-drills" requires a swimming-pool in order to be conducted meaningfully and safely. Since the Bandari College does not have a swimming-pool, arrangements to hire one can be made with any of the various clubs having swimming-pools.

CHAPTER 5

PROPOSED CURRICULUM OF TRAINING

5.0 Introduction

The primary reason for establishing the intended Ratings Training Institute is, as the name suggests, to provide education and training for the participants to enable them serve the shipping industry satisfactorily as ratings in accordance with IMO's STCW Convention and provide them with education which will prepare them for advanced certificates.

The major role of the Institute will therefore be that of providing necessary courses to prepare the trainees to acquire the minimum set standards according to the STCW Convention and obtain a certificate to that effect, on being assessed at the end of the course.

5.1 Elements Of Curriculum

Professor Fisher stated during one of his lectures at WMU in 1996 that:

'Curriculum can be conceptualised as that selection from the whole stock of knowledge available to a society which those in the educational system aim to pass on to the succeeding generations'.

It is more or less recognised universally that any curriculum is made up of four essential elements as follows:

- objectives
- contents
- method
- evaluation

5.1.1 Objectives

Usually at a glance, aims, goals and specific objectives are lumped together as objectives. However it is important to distinguish between them in designing a course and how they relate to the stages of the curriculum process.

5.1.2 Content

Objectives are normally the criteria by which materials and subjects are chosen and the curriculum is processed. The range of knowledge and skills, required in various subjects, to be achieved by trainees to be able to perform specific duties after a specific course, form the course content.

5.1.3 Method

Choosing the right method to provide the desired learning experience is very important in curriculum planning. It leans heavily on such factors as objectives, subject matter to be taught and the learning situation. It is true that there are several ways to follow to arrive at a desired result. But obviously it is best to use the easiest one to follow. This makes the above said learning situation the starting point for

choosing the method, reinforced by what the education system in a country exposes its students to. That is their learning experience.

5.1.4 Evaluation

Evaluation of curriculum as opposed to assessment, is concerned with determining the value of the process at any stage of the curriculum development, whereas assessment is the process by which individual performances at the end of a course are measured. Invariably, evaluation can be made from the assessment of the students' performance.

With the ever progressive advancement of technology, it will be clear on examining say the curricula of the nineteen seventies, that the then curricula are out-dated by the present technology's demands. Hence the curricula were reviewed and upgraded accordingly in different countries after their evaluations, to meet the needs of today.

Curriculum evaluation should be made vis-à-vis the objectives, to verify the validity of the content and effectiveness of the methods.

5.2 The Bandari College Facilities

Since the proposed Ratings Training School is to be a unit within the Bandari College, it is appropriate to give a view of the existing training facilities at the Bandari College.

The information about the existing training facilities at the Bandari College was received from the office of the Principal of Bandari College.

The college is situated at the South West corner of Mombasa Island, adjacent to Mtongwe ferry jetty, on five hectares of land.

The facilities include a conference hall, a committee room, an auditorium, a library, twenty lecture rooms, five engineering workshops, a model sea terminal, a dining hall and kitchen, a hostel, administrative offices and office facilities for the Secretariat of the Port Management Association of Eastern and Southern Africa (PMAESA).

5.2.1 Conference Hall And Committee Room

These are air-conditioned rooms on the fourth floor adjacent to each other, covering a floor area of 230 and 140 square metres respectively. They command a panoramic view of the harbour entrance and are frequently used for high-level national and international functions.

5.2.2 Library

The library occupies 370 square metres on the second floor of the main building. The air conditioned library has the capacity to shelve thirty thousand volumes, although at present it has about half that capacity on the shelves, which are mostly maritime transport and technical publications.

The college also subscribes to eighty journals and periodicals.

5.2.3 Lecture Rooms

There are twenty lecture rooms each covering 49 square metres. The rooms are designed to accommodate twenty participants each. Sixteen of the lecture rooms can double by folding or removal of the partitions.

5.2.4 Engineering Workshops

The Engineering workshops are housed under one long structure covering an area of 1,600 square metres and sub-divided into five workshops. The five Engineering workshops cater for Electrical, Marine, Civil, Plant and Automotive technical training.

All workshops are equipped with basic training facilities in the following trades:

- motor vehicle plant maintenance.
- electrical fittings and installation.
- plating and metal fabrication (welding).
- masonry and plastering.
- marine fitting .
- woodwork and boat-building.
- painting and decorating.

5.2.5 Model Sea Terminal

This is a simulation of a modern sea terminal and consists of a mock-hatch, one quay crane, quay apron, covered and open storage areas. The concrete built mock-hatch has a lower hold and “tween-deck” with a grain capacity of 2,000 cubic metres. On it are mounted two derricks which are winch operated.

The quay crane has a safe working load (SWL) of 5 tons and is capable of travelling, lifting, lowering, slewing and luffing in and out.

The quay apron, simulating a shed, is 12.5 metres wide. The covered storage area is 420 square metres designed to maximise utilisation of space. It has two end and four side doors, one main longitudinal and four lateral aisle-ways. There is a free space margin of 1 metre around the simulated shed.

The open storage area which measures 2,000 square metres, is used to demonstrate proper stacking, in addition, it is also used for practical training of forklift truck drivers.

5.2.6 Hostel And Catering Facilities

The hostel is fully air-conditioned and is designed to accommodate senior participants and visiting lecturers. It has ten suites, sixty self-contained single bedrooms and general utility facilities.

The dining hall which has an area of 640 square metres, can accommodate 400 people at a sitting. Adjacent to the dining hall is a well equipped kitchen.

The college does not have catering staff of its own at the moment. Consequently, for the participants in various conferences, seminars and workshops accommodated at the Bandari College hostel, the college administration makes arrangements with local hotels offering external catering facilities to serve meals to the participants.

5.3 Proposed Course For Ratings

The course is to be designed for dual purpose training. It will cover basic safety programmes as required by IMO's STCW Convention as well as navigating and marine engineering practical training. This will prepare graduates, on successful completion of the course, for service on board vessels performing appropriate duties either on deck or in the engine room, as may be directed by the Master.

In addition, the skills acquired should enable them to serve in the maritime related shore based industries, since there is a limited number of ships flying Kenyan flags, hence job opportunities in the Kenya merchant-shipping market are low.

5.3.1 Course Aims

The ratings course aims will be:

- a) to produce graduates to serve in the merchant shipping industry and other maritime related industries.
- b) to stimulate the trainees for co-operation in team work, self discipline and personal safety.
- c) to educate trainees on the importance of observing stringent measures imposed on the industry by international instruments like the MARPOL (Marine Pollution) Convention.
- d) to provide education which will be a foundation and an initiation for higher learning and acquisition of superior certificates in the maritime industry.

5.3.2 Course Objectives

On successful completion of the course the graduates should be able to:

- perform basic watchkeeping duties both on navigation bridge and in the engine room and general on board ship operations and maintenance(deck and engine room)
- respond promptly and safely to any emergency situation on board ship.
- understand rules, regulations and any other relevant codes that contribute to safe and legitimate vessels' operations.
- pursue more advanced hands-on skills with the help and guidance of senior personnel and also pursue higher academic knowledge leading to superior certificates of competency.

5.3.3 Entry Requirements

Advertisement.

The advertisement inviting applications from Kenyans with relevant secondary school qualifications or equivalent, should be made through mass media. Print media is undoubtedly the most widely circulated. The majority of Kenyans can afford at least one copy of the daily papers, because of the papers' relative low cost. Hence it should be the preferred media choice to carry the advertisement. The three daily English Newspapers should carry the advertisement.

However the selection board/committee, comprising representatives from the College administration, the trade union, the Merchant Shipping office and the industry should have the prerogative to decide to back-up the advertisement in the print media with electronic media advertisement, preferably the radio, since a sizeable population cannot afford a television set and electricity supply is yet to reach the rural areas.

The applicants should be informed to indicate the course they are applying for as 'General Purpose Marine Technician Certificate' (GPMTTC) course, because that is

the proposed name of the certificate to be awarded to successful trainees at the end of the course.

Prerequisites

The applicants for the GPMTTC course should satisfy the following requirements:

1. Be holders of at least average grade “C” pass in the Kenya Certificate of Secondary Education, with minimum pass grades of;

- i) C+ in Mathematics
- ii) C in Physics
- iii) C in English Language
- iv) C in Geography.

2. Suffer no physical deformity.

5.3.4 Pre- Course Test

The applicants with the best qualifications will be short listed for a written admission test and be subjected to an aptitude test as well.

The successful candidates will then undergo a Medical Examination for eye-sight, colour-blindness, hearing and blood pressure. Radiographic examination of their chest X-rays will be done and blood tests for any incurable diseases carried out.

The purpose of the entry test is to diagnose and determine the extent of prior mastery of the course objectives. This will facilitate good teaching planning, once the learning situation is established through the entry test.

Records of all finally selected trainees will be properly kept, as this will assist in monitoring the progress of the trainees as the course progresses. Initial population of trainees is suggested to be forty, made up of two streams with twenty trainees per stream.

5.3.5 Course Programme

The course will be completed in a duration of two years divided into four semesters. The first three semesters will be spent at college learning academic and theoretical vocational subjects, metalwork and workshop technology, personal safety, search and rescue, survival at sea and basic fire fighting.

The last semester will be partially at college, with trainees taking their final examinations in the first two weeks of the semester. The successful trainees will be awarded a provisional GMPT certificate.

The remaining part of the semester will be on-board ship guided training. Each trainee will be provided with a recordbook to be duly completed by the Master and Chief Engineer on the ship. After which the graduates will finally receive a full GMPT certificate from the Merchant Shipping Superintendent, on behalf of the Ministry of Transport and Communications.

5.3.6 Lecture and Instruction Hours

FIRST SEMESTER.

<u>Subject</u>	<u>Hours</u>
Maths	95
Physics	70

Engineering Science	95
Safety and Survival	120
Technical Drawing	30
Nautical Science/Navigation	95
Physical Education/Swimming	40
Workshop Technology/Practice	30
Computer Application	<u>30</u>
Sub-total	605

SECOND SEMESTER.

<u>Subject</u>	<u>Hours</u>
Naval Architecture/Ship Construction	40
Maths	95
Electrotechnology	120
Marine Engineering	95
Nautical Science/Navigation	95
Technical Drawing	30
Thermodynamics	80
Introduction to Automation	30
Workshop Technology/Practice	<u>30</u>
Sub-total	615

THIRD SEMESTER.

Marine Engineering	120
Navigation/Seamanship	120

Electrotechnology	95
Thermodynamics	80
Fire Fighting/Search & Rescue	80
Ship Automation	75
Naval Architecture/Ship Construction	<u>45</u>
Sub-total	615

FOURTH SEMESTER

Final Examinations	first 2 weeks
Sea Training	Subsequent 26 weeks

5.3.7 Instructional Staff And Equipment

Lecturers and instructors for the proposed course should be duly qualified in the respective subjects they are supposed to teach and be qualified teachers. In the case of lecturers employed to teach purely academic subjects, like Maths, Physics, etc., they should hold at least a Bachelor of Education degree in the relevant discipline. While the lecturers for vocational subjects should be qualified Marine Deck Officers and Marine Engineers holding at least Class II certificate of competency in their respective disciplines and having post qualification sea service of at least two years. This should be augmented by teacher training qualification.

The training materials required for the course will include, among other things the following

- Enclosed motor lifeboat complete with fixed and loose equipment.
- Gravity davit for lifeboat with electric motor hoist.
- Fast inflatable rescue boat and its slewing davit.
- Davit launched inflatable life raft.
- Full liferaft emergency survival pack for classroom display.

- f) 3 Different types of standard life-jackets for classroom display.
- g) 25 Life-jackets for practical exercises for trainees and staff.
- h) Resuscitation sets.
- i) Lifebuoys and lines.
- j) Neil Robertson stretcher.
- k) Respiration and resuscitation demonstration aids.
- l) Breathing Apparatus.
- m) Air compressor unit.
- n) Fire hoses of different diameters.
- o) Fire nozzles, (jet and combined jet/spray)
- p) Stand-pipes with key and bars to operate hydrant supply.
- q) Portable fire extinguishers (water, foam, carbon dioxide and dry powder).
- r) Smoke helmet and bellows.

CHAPTER 6

CERTIFICATION PROCESS

6.1. Continuous Assessment

Trainees will be continuously assessed throughout the duration of the course in their course work, assignments and end of semester examinations. Accurate records of the results will be properly kept to enable monitoring of the trainees' progress.

The records will serve as an indication to the learning process and its effectiveness. This will enable adjustments of the teaching material and methods as necessary.

The results of all tests and assignments must be given back to each trainee to help the trainee know his performance so that the trainee can improve in areas of weakness.

Continuous assessment scores will form 40% of the final grade, while the actual examinations will form 60%.

6.2. Final Examination

At the end of the course the trainees should be assessed to measure their overall achievement in the training and instructions received during the entire programme.

The assessment must reflect accurately the students' ability and knowledge, within the prescribed course objectives.

Since the examinations are meant to be fair, there is a fear of this not being so if the examinations are conducted and marked by the student's lecturers or instructors. The main reasons for this are that a student's earlier performance in class and personal relationship with lecturer or instructor might influence the assessment.

To eradicate this fear, external examiners from the Kenya Examinations' Council should set and mark purely academic subjects. For the vocational subjects, there should be a joint panel of examiners comprising appointees from both the institution and the Merchant Shipping Superintendent's office.

Written examinations, which should be a combination of essay type questions and multiple choice items, depending on the subjects, should be the means to measure cognitive outcomes of the objectives. However, the psychomotor outcomes should be assessed through laboratory work and practicals.

The reward of the examinations for the successful trainees in the proposed course programme is a GPMT certificate, which should be recognised under the revised STCW Convention.

6.3 Programme Evaluation

'Undertaking evaluation, the highest level in the hierarchy of terms, is based upon assessment interpretations of the collected data. With the information gained from measurement and assessment, educators are in a better position to make *value judgements* which are invariably expressed as written comments. The important feature of educational

evaluation, however, is that it is based upon assessment data and not upon whim or fancy' Print Murray, (1993, page 196)

For any educational institution to effectively meet its objectives, it should be able to look back at a completed programme and critically analyse collected data on the outcomes of such a programme. This will aid in identifying how effective or ineffective the institution's performance has been in meeting its objectives.

Consequently arrangements for any necessary adjustments can be made to ensure satisfactory future performance in meeting the described objectives. The sources of information of the collected data about the programme outcome shall include, among others:

- results from the trainees' assessments.
- reports from both resident and visiting lecturers/instructors.
- feedback from the industries served by the graduates.
- student's questionnaires and interviews.

From the data received through the above sources, areas of weakness can be revealed to the authority of the institution, as a result corrective measures can then be taken to improve upon the weaknesses.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Kenya being a member state of the IMO, it is surprising and disappointing that she does not have an MET Institute for training prospective seafarers to national and international levels, despite being a coastal state.

It is therefore the contention of the author that with the establishment of a Ratings Training Institute, general awareness and understanding of the MARPOL Convention and its annexes I to V will be enhanced, as will be the SOLAS Convention.

In April 1994, a maritime calamity occurred within the Mombasa Kilindini Harbour. A small passenger ferry, M. V. "Mtongwe", plying a 300 metre stretch linking Mombasa island and the mainland, sank with a loss of more than 271 lives as a result. Since there was no passenger manifest, no one knows for certain how many more bodies were unaccounted for. The figure 271 was of the actual recovered bodies from the maritime disaster.

The M. V. "Mtongwe" was owned and operated by the Kenya Ferry Services Company (KFSCO). As a result of a bilateral charter agreement between the Kenya Government and KFSCO, the commuters on the ferry travelled as non-fare paying passengers.

What was mortifying to the company after the accident, was the testimony given to the commission of inquiry panel. The boat's coxswain who was among the survivors, testified that the life-jackets on board were stored and locked-up in a cabin. This raised the question on whether the KFSCO has trained the crew of all their vessels on the importance and the proper use of , safety and survival equipment on board their vessels.

The findings of the inquiry instituted by the Government into the accident, blamed overloading and lack of proper training for the crew that manned the ill-fated ferry.

So there is little doubt, if any, that if the three man crew of the ferry had had formal training to high standards, the disaster could have been averted altogether. If not, the casualty figure would have been lower. With correct emergency response from the crew and appropriate application and location on the ferry, of life saving equipment such as lifebuoys, lifejackets, etc. more lives could have been saved.

A well known fact world-wide is that the Philippines is the leading nation in the supply of seamen globally. Generally, shipowners will only employ seafarers with internationally recognised qualifications. This can only be achieved through training, and indeed the Philippines has exploited that, with fruitful gains for the country, by training their seamen to internationally recognised standards as laid down by IMO's STCW Convention.

So it is a viable venture for the Kenya Government to support fully the establishment of a Ratings Training Institute, because it will offer better prospects of securing employment in foreign registered vessels for trained seafarers, thus reducing unemployment in the country. The other benefit the country would enjoy, is foreign exchange earnings through moneys repatriated by the seafarers. Furthermore, highly

trained seamen would be manning all marine Kenyan registered crafts in Kenyan waters, which would enhance safety and environment protection.

7.2 Recommendations

- In view of the fact that the Kenya Government, through the Ministry of Transport and Communications, agreed that establishment of a Ratings Training Institute is in line with the Government's needs, as evidenced in the letter mentioned in Chapter 4 of this document, the onus of demonstrating sincerity rests with the Kenya Government. The author therefore recommends strongly that a serious follow-up of the issue is made to make the IMO's Inter-regional Sectorial Support Consultant's recommendations of establishing a Ratings Training Institute, a reality.

- Since the mid nineteen seventies, the Kenya Government introduced a cost sharing policy for the University undergraduates. The undergraduates hitherto received free university education, in that the cost of their University education was fully met by the State. As opposed to the earlier undergraduates, those who were enrolled for University studies in the mid seventies had to sign a bond to repay the cost of their University education to the Government, after graduating and securing employment. It is recommended that the same arrangement be accorded the trainees who are admitted to the Ratings Training Institute, and not attached to any employer.

- For the immediate suggested recommendation to be practicable, the Government should ensure the following:
 - a) That the Merchant Shipping Superintendent in liaison with the IMO and the Bandari College, introduces a new certificate structure related to the STCW

Convention and issues all newly registered Kenyan seafarers and re-trained existing registered seafarers, with an internationally recognised certificate suitable for employment on foreign registered ships.

b) That the KPA, which owns the Bandari College, or any other appointed Government arm, appoints a reputable Crewing/Manning Agency to contract and employ graduates from the Bandari College as seamen. The Crewing Agency appointed should be a well established one with renowned reputation and connections world-wide.

- The dynamic nature of technology requires continuous review and evaluation of curriculum. Consequently it is recommended that a committee be established under the Principal Bandari College to act as internal curriculum evaluator. At the same time, in compliance with the revised STCW Convention, Section A-1/8 (3) of the mandatory Code A of the said Convention, independent evaluations should be made at five year intervals. To this effect, assistance should be sought for the provision of qualified independent evaluators from IMO, should there be no suitably qualified Kenyans with relevant maritime background.
- The training programme for training lecturers and instructors should be set up to ensure that they do not slip behind the technological advancements. Such training will benefit the staff concerned and arm them with the latest material to pass on to the trainees during their learning activities.
- External links should be established with other institutes such as the AMC in Tasmania, Australia and the Association of African Maritime Training Institutes (AAMTI) in Alexandria, Egypt. This will enable graduates with GPMT certificates from the Bandari College to pursue further studies in advanced courses which are not taught at the Bandari College.

- Lecturers and instructors who are fully trained for the intended levels of instruction for the IMO Model Courses, should be deployed to carry out the following courses;

IMO Model Course 1.13 Medical Emergency.

IMO Model Course 1.19 Personal Survival.

IMO Model Course 1.20 Basic Firefighting

The Government should seek technical assistance and funding for the establishment of a Ratings Training Institute. There are a number of international Donor Agencies which can be approached for assistance. Such Agencies include IMO, UNDP, OECD and SIDA.

- The author while attending the International Conference On Marine Simulation And Ship Manoeuvrability in Copenhagen, Denmark in September 1996 (MARSIM '96) learned an interesting point from the key note lecture by Mr. W. A. O'Neil, the Secretary-General of IMO, on International Legislation for Maritime Safety. From the Secretary-Generals' speech, it came to the author's notice that the Filipino seafarers serving on foreign ships, have to repatriate about 60% of their earnings back to the Philippines, by Law. Likewise the Kenya Parliament should pass legislation requiring seamen trained under the above scheme, and serving on foreign vessels to repatriate at least 50% of their emoluments from the contracted employment through the Crewing Agency.

MINISTRY OF TRANSPORT AND COMMUNICATIONS

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and date



OFFICE OF THE PERMANENT SECRETARY

NGONG ROAD

P.O. Box 52692

NAIROBI, KENYA

22nd June, 92

.....19.....

Mr. W. A. O'Neil,
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 LONDON SE1 7SR
UNITED KINGDOM

IMO MISSION REPORT ON THE INTER - REGIONAL SECTORAL SUPPORT CONSULTING
 IN MARITIME TRAINING - CAPT. ERIC MOAT.

=====

Please refer to the terms of reference for the above consultant and his
 Mission Report on which we have the following observations to make.

We should start by thanking the Consultant Capt. Eric Moat for the good
 detailed work he did, which is clearly reflected in his report.

MARITIME CONVENTIONS:

After receiving the report, the Government embarked on a process of ratifying
 the relevant conventions reflected in the report, and we are happy to report
 that approval has now been given for accession and ratification of the
 convention on Standard of Training, Certification and Watch-keeping for
 Seafarers (STCW) 1978 among others. We are taking the necessary action to
 accede and ratify the convention and your assistance on this will be highly
 appreciated.

The above is in line with the report's recommendations.

OTHER OBSERVATIONS

The consultant observed that lack of proper and adequate training facilities
 for Kenyan Seafarers at International level has great disadvantage to Kenyan
 Seafarers in obtaining employment in foreign ships thus he emphasised on
 establishment of a Rating Training School for Kenya. This we highly appreciate
 and request IMO once again for assistance in the establishment.

It is a fair observation by the consultant that Bandari College with upgrading
 of several training facilities extended to its Marine Training Unit would
 be in a position to meet not only the needs of Kenya Ports Authority Marine
 Department but also the National Training needs of Kenyan Seafarers.

DRAFT PROJECT DOCUMENT

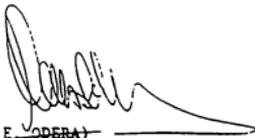
The Draft Project Document as presented by you covers adequately all the
 vital inputs and outputs for the proposed Bandari College Rating School
 and we accordingly forward the same to the Ministry of Finance for their
 necessary action.

PRIOR OBLIGATIONS AND PRE-REQUITES:

The recommendations that the Director of Bandari College Marine Unit Capt. Basty be the Director of the proposed Rating Training School and the Project Chief Technical Adviser has been overtaken by events, as the officer has already terminated his services with Kenya Ports Authority. This recommendation may therefore be revised.

CONCLUSION:

This Ministry is satisfied that the project was well undertaken and the recommendations are in line with our needs. We therefore further request IMO to give the necessary assistance in implementing the recommendations as advised and that Capt. Eric Moat be given a chance to come and discuss with the Ministry officials and Kenya Ports Authority on the modalities of implementation of the report.



(C. E. ODERA)

FOR: PERMANENT SECRETARY

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