Manpower study approach to the establishment of a maritime education and training system

Carlisle Marconi Jordan
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A MANPOWER STUDY APPROACH TO THE ESTABLISHMENT OF A MARITIME EDUCATION AND TRAINING SYSTEM IN TRINIDAD AND TOBAGO.

BY

Carlisle Marconi Jordan.
TRINIDAD AND TOBAGO.

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 own personal views and are not necessarily endorsed by the University.

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A MANPOWER STUDY APPROACH TO THE ESTABLISHMENT OF A MARITIME EDUCATION AND TRAINING SYSTEM IN TRINIDAD AND TOBAGO

CARLISLE M. JORDAN.

TRINIDAD AND TOBAGO.
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This thesis proposes some procedures for the establishment of a maritime education and training system in Trinidad and Tobago. In this process, a manpower study approach was utilized and this entailed a survey of the maritime industry to arrive at an estimate of the fleet size, its structure, operation and projected development and the associated manpower supply and demand.

The returns of the survey, although they have been analysed as being not significantly definitive when viewed together, individual sectors of the industry do however, indicate certain specific trends towards the education and training needs in terms of quantity and quality of seafarers, within the limitations and constraints which have been identified.

In the application of the survey findings to the task in hand, and taking into consideration certain assumptions based on observations of the state of today’s world shipping, suggested objectives have been postulated. These have provided the basis for the devising of a philosophy, the deciding of a process and the identification of the type of infrastructure necessary to implement the new system.

In more specific terms it has been recommended that:

(i) in the short and medium terms, Trinidad and Tobago should not embark directly into the education and training of seafarers for the higher level certificates of competency for the international trade. It should seek to have this group of personnel educated and trained where facilities are already available in a place such as Jamaica, a member Caricom State.
(ii) Trinidad and Tobago, in the short and medium terms, should lay more emphasis on the upgrading and the education and training of personnel for local operations and needs.

(iii) in the establishment of objectives, the maritime industries should be considered together.

(iv) in devising a philosophy and process there should be an integration of the maritime education and training system and the general education system.

(v) at the implementation stage, although a pivotal institution has been identified and defined, due consideration should be given to the complementary and supportive roles which can be played by existing institutions, organizations and agencies.

(vi) the concept of a Caribbean regional approach to maritime education and training deserves some consideration by the maritime administrations in the area.
Trinidad and Tobago although not considered a major maritime nation in the traditional sense is involved in maritime activities at the national, regional and international levels. Around the coastline, in its territorial waters and the Exclusive Economic Zone (EEZ) some of these activities include marine petroleum and gas exploration and transport, cargo and passenger transport between the islands, drogher operation, fishing, pleasure craft activities and port operations. At the regional level there is intra regional trade in consumer and semidurable items while internationally the export of crude and refined petroleum products, fertilizers and steel and the import of large volumes of consumer items, durable and semidurable products and some bulk for industrial purposes form the principal activities.

There is a nationally owned shipping company which operates internationally and the State is also a shareholder in the operation of another which serves the wider Caribbean region.

The need for the training of maritime personnel has been recognized for some time now and in 1974 a Fisheries Training Institute was established in the country with the assistance of the United Nations Development Programme/ Food and Agricultural Organization (UNDP/FAO) and the participation of Barbados, Guyana and Trinidad and Tobago, thereby making it a Caribbean regional institution. The objective at that time was the training of fishing skippers and crewmen for deep sea trawlers to operate along the North Eastern Coast of South America and the
Brazilian Coast.

Within the past recent years, the need for the education, training and upgrading of nationals to participate in wider maritime activities beyond fishing has become more evident. In addition, there has been an upsurge in interest by other regional Caribbean States to utilize training and information facilities being offered in Trinidad and Tobago through the Fisheries Training Institute and other media.

The Government with the assistance of the International Maritime Organization (IMO) and another aide donor country is in the process of reviewing and updating not only maritime legislations to meet perceived needs but also the upgrading of the existing Fisheries Training Institute into a Maritime Training Centre for the education and training of personnel in the fields of Nautical, Engineering, Fisheries and Port Operations. This latter exercise is being attempted although there is no updated nor defined training, examination and certification procedures. In addition the IMO Convention on the Standard of Training and Certification of Watchkeepers, (STCW) is yet to be put into effect and the existing maritime legislations date back from the British Merchant Shipping Act of 1894 and limited revisions into the 1960’s.

With all the vagaries and uncertainties which have been besetting the general international maritime industry within recent years through the over supply and decreased demand for cargo space, unemployment of qualified seafarers, escalating manning and maintenance costs, rapidly advancing technologies, the trend towards dual purpose/polyvalent training, unmanned machinery space and
the intelligent ship among other factors, the embarkation of Trinidad and Tobago in the arena of maritime education and training should be cautious, measured and well thought out. Even in developed maritime nations faced with this current situation there has been not only a reduction in intake of both nautical and engineer officers by shipping companies and consequently training institutions but also these training institutions are either being closed or rationalized. To this end, approaches and means should be considered and applied in efforts to assess adequately maritime personnel requirements in terms of quantity, quality, deployment and the attendant cost benefits both from capital and recurrent expenditures in the training process. A suggested procedure which may satisfy most of these criteria would be the application of a Manpower Study Approach to the establishment of an education and training system.

In considering this subject of maritime education and training as it would relate to Trinidad and Tobago, this document limits itself to proposals on broad objectives, philosophy, process, infrastructure and the implementation of such a system after an examination of the manpower supply and demand for seafarers. It also chooses to be devoid of too many details or become too deeply involved in aspects of examination and certification which it is believed would require details of syllabuses, curricula, examination and certification legislations and procedures, all of which can form subjects of separate and independent studies outside the scope of the present context.
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Chapter 1

Education and Training in Maritime Safety

1.1 Maritime Education and Training—A Definition

Education and training in maritime activities was and has always been essential when twenty-four (24) centuries ago PERICLES said that "seamanship is an art". It is not something, he continued "that can be picked up and studied in one's spare time, indeed it allows one no spare time for anything else." (A. Allievi, 1981).

Maritime education and training is not merely attending a course but rather it is a continuous effort in which seafarers as well as shore management are fully involved. It is an educational process which has no end. It is also more than the sum of knowledge and skill but in addition, because of the human flexibility, the ability to develop in him various attitudes and the ability to weigh up situations and make correct judgements. Also, because he has to relate to other human beings he needs expertise in getting the best out of people and an understanding of a range of behavioral matters. Both shore and sea based groups of maritime personnel must be convinced that education and training is the only means to keep abreast of technological improvements, new regulations, conventions and safety requirements which are the daily basis of safe shipping operations.
There is no doubt therefore, that maritime education and training deals with human beings and so it is to the human factor in today's maritime environment that serious attention must be addressed to pinpoint the education and training requirements for today's mariners and particularly for those serving on special ships. The effectiveness of this education and training may be enhanced if all the shipping business or industry are constantly informed on the numbers to be trained, the levels and types of training required, the state of current and projected technologies for which training is required, the duration of training and the transfer of learned activities, the rate of turnover, wastage or fluctuation of qualified personnel and many other factors which relate directly and indirectly to the manpower supply and demand of the maritime industry.

1:3 Unsafety in Maritime Operations

The rate of loss of life and property at sea have been used over the past century as measures of the degree of unsafety in maritime operations and it is agreed by many sources that the sinking of the Titanic in the North Atlantic in 1912 with the loss of not only the entire ship but 1489 of its 2201 passengers and crew was a real landmark in galvanizing the world maritime community in giving more positive and serious considerations to the initiation, promotion and implementation of safety standards in all sectors of the maritime industry.

The matter of pollution of the environment and the consequential damage to marine renewable resources, beaches and other aesthetics of life has recently been
added as another yardstick or measure of unsafety and the foundering of the VLCC Torrey Canyon in 1967 off the coasts of France and Britain had the effect of quickening interests towards the prevention of pollution of the seas.

Numerous reports and sources have oftentimes cited that about 80% of accidents and casualties at sea have some relationship to human involvement whether it be through direct lack of knowledge, negligence, failure of equipment or extenuating circumstances.

Unsafety in maritime operations has always resulted in the search for remedies by shipowners, operators and governments and throughout the history of shipping various measures for regulating the industry have been initiated. Around 1836 the British Government was driven to set up a Select Committee of the House of Commons as a result of the hundreds of seafarers and ships lost at the turn and early part of that century. This Committee reported among other things that these losses of lives and property were due to defective construction, inadequate equipment, bad repairs, improper loading, incompetence of crew, the nature of marine insurance, lack of harbours and poor charts. Even today and moving into the 21st century the majority of these facets are still engaging the active attention of national maritime administrations, the international maritime community, shipowners, marine insurance interests, classification societies, operators and the seafarers themselves.

1:4 Development of Maritime Safety Standards

The intervening years from the first International Conference on Safety at Sea 1913-1914, initiated through the sinking of the Titanic to the mid 1950's into the
1980's, have seen tremendous strides being made both at the national and international fora towards the safety of shipping operations. Both the International Labour Organization (ILO) and International Maritime Organization (IMO) have played significant roles in these ventures. Outstanding by the ILO is the ILO Convention 147 and its many annexes which deal with Minimum Standards in Merchant Ships to include safety, qualification, working conditions, wages, health standards and employment practices for seafarers.

The IMO on the other hand has been able in its twenty-nine (29) year existence to bring to the international maritime community and consequently to national governments a number of international conventions, codes, regulations and guidelines to promote safer shipping and cleaner oceans. The most important among these are:


These Conventions and various others have received a fair measure of acceptance and implementation from the 130 member governments of IMO and the world maritime community at large. However, the machinery as evidenced by the need for legislation, manpower and the attendant costs
to put them into effect by member states from the "so
called" developing world has been a handicap to their
overall effectiveness.

One of the foremost of these Conventions is the STCW
(1978) which seeks to set minimum guidelines for the edu-
cation, training and certification of seafarers with the
express purpose of increasing the margin of safety
through better trained individuals especially as techno-
logy advances continuously. However, the problem of mari-
time education and training in developing countries seem
to be twofold since not only are these countries having
to catch up with standards of the more developed coun-
tries as far as new technology and operating practices
are concerned but they are having to meet the manpower
needs of their growing fleets.

1:5 Maritime Education and Training and Unsafety

Efforts in maritime education and training are gene-
 rally spurred on by the level of unsafety which may exist
at a particular time and also take into consideration the
causes of this unsafety i.e. man and/or technology. At the
same time the various interests in the shipping industry
strive to find that optimum mix of factors to reduce
unsafety and improve safety while at the same time bea-
ring in mind all environmental factors. The human perfor-
mance can conceivably be an overriding element which can
determine how safe shipping can be. The appropriate trai-
ning at the correct time and under the best conditions
can serve to strengthen this premise.
The strong desire of developing countries to get a fair share of their overseas trade has made it necessary for them to acquire ships and additional tonnage. This has caused some to make serious efforts to educate and train their own nationals in the different specializations of seafaring to enable their own ships to operate efficiently and competitively. One first step along that road could be accomplished by training their own personnel by initially utilizing educational facilities in developed or other developing countries. The ultimate goal should naturally be to establish their own training institution bearing in mind that there should be a philosophy and a proper understanding of the training requirements.
2:1 Introduction:

Whilst it may be true that the human being is highly fallible, it is simplistic to blame him solely for accidents when the causes of failure are far more likely to be a complex interaction of factors involving at least the MAN, the MACHINE and the ENVIRONMENT.

On the face of it, therefore, the human argument may give reasons to do away entirely with the human element. However, it is recognized that the human being is a vital aspect in the operation of ships because he has the ability to think, exercise judgement, to over-ride machines and to take decisions of a kind which robots will probably never be able to achieve. For all his fallibility, he is still the best and most flexible asset in the operation.

2:2 The Maritime Education and Training Objective

For maximum effect, maritime education and training should be relevant. The trainee should know that his training actually relates to his duties, that is, it is in context and that he can fit into the working environment on completion. An illustration of the latter point is the comprehensive seamanship and safety training provided for deck ratings who then find that they are sent for employment in a very modern ship where their only duties
are washing and cleaning. This is not only a waste of training and human resources, it is also demoralizing for the individual and can result in a high rate of turnover of disillusioned staff and consequently raising industry costs.

In many ways also, maritime education and training is still regarded as something to meet national and/or international regulations and should be got out of the way as quickly as possible. If this is so, it will be a disappointment because it does not allow the trainee to demonstrate in full the contribution that effective education and training can make to the success of the enterprise. On the contrary a major goal/objective of the training process is to communicate or pass on knowledge and skills to the seafarer in such a way that a proper transfer of these attributes can take place in the working environment efficiently and with a minimum of error.

2.3 The Education and Training Processes

Traditionally, unlike most other industries, practically all maritime education and training courses leading to examination and certification are tightly prescribed and run on a national basis to agreed syllabuses. Maritime education and training has to meet content requirements and standards that are basically laid down by International Conventions and reflected in national legislations.

According to Weight (1981), however, there seems to be a trend towards tailoring the education and training requirements to what the operator is required to know and do. This, he contends, has happened with the establishment in the United Kingdom of statutory training boards and the training industry. In this illustration the trainer provides the appropriate training after an analysis of
the job and the environment have been made. This environment includes any legislations and safety and health factors. This results in the preparation of a knowledge and skills specification which becomes an education and training specification and a course syllabus including not only terminal objectives but an indication of entry level so that the education and training process can be geared to the people who are to be trained.

2.4 Some Factors in the Education and Training Process

In examining the concept of the maritime education and training process to satisfy certain objectives, there are various factors which may feature and should always be borne in mind since they may operate either singly or in different combinations as assets or constraints. Among these factors may be:

2.4(i) Owners’ Requirements:

These requirements may be prescribed by the type of ship, the environment in which it operates physically and commercially and the style of the company owning and managing the ship. The owner/manager, therefore, has the ship and equipment and presumably knows how he wants them operated. No two ships are exactly the same and there are many trades and sea routes as well as many different types of equipment. From these guidelines the overall objective of the owner can possibly be determined. It can be concluded, generally that the final objective of the owner/manager is a commercial and profitable ship in addition to it being safe and trouble free. These two factors may not always be compatible although it may be the ideal requirement.
2:4(ii) Management Style

This factor may not necessarily be considered a sound indicator of overall objectives of an education and training programme. Even if it is, it may, not always be helpful in the education and training process and so broad assumptions may have to be made, yet not discounting it as an important consideration. The management style of a company, for example, may indicate the need for a different number of different groups of ships within one operating management and if say a reasonable mobility of labour is required then it may not be a feasible proposition to train specifically for one ship type as far as this management style is concerned.

2:4(iii) Physical Operating Environment

The physical operating environment may be considered as being reasonably constant in that the sea is wherever one goes. When the weather, sea state and bottom conditions vary, they do so within definable limits. The other main variable here is the proximity to other traffic and the effects this may have on the operating environment.

Within recent times as ship/fleet management techniques have changed, the commercial environment has tended not to be the concern for the seafarer as formerly. Rarely is the ship master responsible for the procuring of cargo and stores and his ability to influence profitability of the ventures in this way may be considered very small. However, when margins of profitability are relatively minimal, decisions taken aboard ship, not only necessarily with regard to the commercial environment but rather with technical performances of the ship
can have considerable effect on the commercial viability and therefore this factor may become a matter for the education and training approach.

2:4(iv) Manning Philosophy

The crew size may be determined by manning policy and legislation. This is so since the ship itself is inadequate to provide the basis for a full job specification unless there is a completely new system being designed to encompass shipboard manning and operation.

Within manning legislations there is often room to manoeuvre and the final organization of the work force aboard ship is often determined by the operator. Here, specification as the types and numbers of officers beyond the minimum and the organization of the ratings work force will be made and this may provide some indication as to job specifications and so contribute to the education and training process.

2:4(v) Man -Machine Interface

The question of the interface between the professional navigator or engineer and his equipment as the industry undergoes changes deserves very close attention in the development and implementation of education and training programmes. A ship requires many different types of skills to be exercised and many different types of individuals to man it. The approach to education and training should take a wide view of the responsibilities of individuals and the environment surrounding their jobs. From the education and training point of view the ship should be looked at as a whole and then the total operational and maintenance skills assessed and grouped toge-
ther for compatibility instead of the traditional headings of deck, engineer, radio and catering. As long as the engineer is regarded as having the engine room as his domain and the deck officer the bridge then a system of demarcation is perpetuated which would prevent a real manning and education and training break through as technology advances.

2:4(vi) Lead Time

Attempts to change the education and training system to meet possible future requirements in advance of these requirements being established present problems in satisfying existing national and international regulations and make both experimentation and implementation rather difficult to carry out. With regard to the training of "dual purpose" officers, for example, it would be pointless to alter regulations, provide facilities and educate the individuals unless the appropriate ships and equipment are available and there is a proper phasing period between these trained individuals and the ships and equipment.

Generally, relatively long time spans may elapse before administrations respond to changes in the industry and by its very nature these changes happen on all fronts quickly and continuously. The diversity of interests and by experience the difficulty to institute changes would create adverse effects on the education and training process and programmes. At times the ship owner and other interest groups who would be more directly affected by long lead times would step in and make up for the short falls in the interim since the maintenance of a viable merchant fleet as various changes occur may be related to the reduction or the circumvention of this factor of lead
time.

2:4(vii) Diversity of Interests

A fairly wide range of restraining influences and vested interests have to be overcome in the final preparation and approval of an education and training programme especially when a new piece of equipment or technique comes along. This can generate a massive inertia and the trainer finds that he can only operate in a reasonably objective way at the margins. These interest groups which may not necessarily be compatible can include employers, trade unions, ships, education and training institutions, government departments and ministries, examination and certification authorities and international organization among others. (Figure 1).

Each of these organizations concerned has a right to its views and their assistance in the formulation of national education and training programmes and standards is vital and necessary. However, some difficulties are always encountered when attempts are made to institute change in long established main stream education and training schemes involving deck, engineer and radio officers.

2:4(viii) Legislative Requirements

Legislative requirements fall into two broad categories—national and international. In the latter case guidelines and/or specifications may be laid down for the final adoption and implementation by national administrations through legal procedures. In the case of the STCW
Figure 1. Interest Groups in Maritime Education and Training. (Modified from Weight, 1981).
(1978) Convention, guidelines to education and training requirements and the minimum standards of competency to be demonstrated by most of the ship's crew are gone into in some detail.

It may sometimes be found that the education and training programme instead of being designed for the perceived needs of the operator and individual and taking into account safety and other legislative requirements, the reverse is the case. It is not the operator but the administration which lays down quite carefully and in detail the education and training requirements. It may be found that even with the best of intentions these requirements can either go beyond or fall below what is needed to cover safety. The margin left for the trainer to take account of the operator's needs can be relatively small.

The shipping industry can find itself in a rather curious situation whereby a large part of its education and training is dictated by a national administration which has no day to day experience of the operating constraints, practices and opportunities of merchant ships, whereas those who have this operational experience may have only marginal input into the final education and training requirements. This shortcoming can be overcome by adding various items to the administration's syllabus or unilaterally imposing additional requirements in the form of short courses and other types of training aboard ship or ashore for own personnel.

Notwithstanding the above observations, the very nature of shipping as an international activity needs to have regulations and guidelines for safety purposes and the national administration must ultimately be responsible. This should include the competence of seafarers through their education and training and the design and equipping of the ship.
Education and Training at Sea or Ashore

The degree of emphasis on shore versus sea-based education and training is another consideration in the education and training process. Each sector has its advantage in the making of a properly trained and efficient seafarer. There is need for an intensive period of training at an establishment or college and also there is need for adequate practical experience at sea to determine the competence of the seafarer. The mix of these two components needs regular review as education and training techniques strive to keep pace with changing maritime technology.

The factors listed above may not be all exhaustive, nevertheless they serve to demonstrate the various and different considerations—some not necessarily always compatible—which have to be taken into account in the process of establishing and maintaining a maritime education and training system.
PART II - GENERAL CONCEPTS OF MANPOWER PLANNING

2:5 Introduction

It is axiomatic that no organization 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 maxim 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 utilized." 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).

2:6 Manpower Planning - Definitions

Manpower Planning may be referred to as Human Resource Planning and Personnel Planning and Employment. Although the terms are interchangeable the general definition points to a single interpretation, that is, "a process for determining and assessing that the organization 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 trial to achieve a balance between supply and demand for manpower."

"a scientific method depending on forecasting the economic and social variables for a fixed time aiming to determine supply of and demand for manpower."

"the process of forecasting both quantitatively and qualitatively the manpower needs of the enterprise in relation to current and anticipated business needs resulting from internal and external changing conditions.

2.7 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:

i) 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 or enterprise.

ii) inventorying present manpower resources and analysing the degree to which these resources are employed optimally.

iii) 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.

iv) planning the necessary programmes of recruitment, selection, promotion, training, motivation and compensation so that the needs of the enterprise can be met.

2:8 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:

i) Future Personnel Needs - Planning is vital for determining personnel needs for the future.

ii) Coping with Change - Manpower planning enables the 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.

iii) 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
iv) 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.

v) 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.

2:9 The Manpower Planning Process

The major components of the manpower planning process include: (i) goals and plans of the organization; (ii) current manpower situation; (iii) manpower forecast; (iv) implementation of programmes and (iv) audit and adjustments.

Although organizations 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.

2:9. (i) 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 likely to be regarded as 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 shortage 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 organization operates, policy changes and objectives of the organization 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 1 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.
<table>
<thead>
<tr>
<th>Factors</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Growth, contraction, diversification, relocation, divestment, new technology, new products, new services- organizational changes.</td>
<td>Sources of information- corporate plan. What are implications. What gaps are there?</td>
</tr>
<tr>
<td>ii) Need for productivity increases-staff and hourly paid.</td>
<td>Does productivity need to be increased to regain/ maintain competitiveness? How much?</td>
</tr>
<tr>
<td>iii) Wastage rate.</td>
<td>Are too many people being lost and why?</td>
</tr>
<tr>
<td>iv) Salary/wage, fringe benefits, bonuses.</td>
<td>Can you attract and retain the people you need?</td>
</tr>
<tr>
<td>v) Age distribution.</td>
<td>Do you have bulges which will cause replacements or career development problems?</td>
</tr>
<tr>
<td>vi) Legislations.</td>
<td>If planning, what are the implications?</td>
</tr>
<tr>
<td>vii) Changing social norms and expectations.</td>
<td>Is there an intention to move towards shorter working week/year, dual jobs? What are the implications</td>
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<td>Table 1 (Continued).</td>
<td></td>
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<tr>
<td>viii) Style of management</td>
<td>Is it changing? Should it? What are the implications for control? More or less?</td>
</tr>
<tr>
<td></td>
<td>ix) Staff development.</td>
</tr>
<tr>
<td>x) Unit size.</td>
<td>What is the policy? Should there be a move towards smaller units?</td>
</tr>
<tr>
<td>xi) Planning time frame.</td>
<td>What should it be? 1, 5, 10 years?</td>
</tr>
</tbody>
</table>
2:9.2 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).

2:9.2 (i) Acquisition
This is concerned with making up any shortfalls which cannot be met by growth and development of employees within the organization. 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.

2:9.2 (ii) 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 organization.

2:9.2 (iii) 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.
2.9.2 (iv) 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 practices (Wilson, 1981).

In conclusion, therefore both the demand and supply sides of the manpower planning process can be subjected 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 environment.
2:10 Introduction

Prior to the 1970's and into the 1980's "the acute shortage of qualified and experienced " maritime personnel was the theme of those organizations and institutions involved with the employment and education and training of personnel for the maritime functions. However, over the past six to seven years, with the decline in shipping and the proportional reduction in the number of seafarers required to operate the remaining fleet, in general, the education and training pipeline without adequate and appropriate adjustment would continue to produce qualified staff at a rate and quality for a merchant fleet that is no longer there. Simultaneously, due to the prevailing effects of the world wide recession the customary high turn over of seafarers to shore based employment is also absent. This situation makes promotion and career development afloat very sluggish, thereby adding to the problems of those currently qualifying and gaining superior certificates of competency and specialised training for the sea. (Heaslip 1984).

Heaslip (1984) also observed that "this sorry state of affair involves the reduction of maritime colleges facilities in the country (United Kingdom). In addition, in recession times when public spending comes under pressure those services which are being under-utilized as are the colleges providing cadet and officer courses will be trimmed to meet lower demand". His observation was supported by Lloyd Ship Manager (June, 1986) which reported in the U.K. a fall of 75% in the cadet intake over the
period 1980—1985. Also member companies of the General Council of British Shipping took in 64 deck officer cadets and 88 engineer officer cadets during 1985 compared to 322 deck and 342 engineer cadets in 1981.

The foregoing scenario seems to suggest quite strongly that future policies regarding education and training and utilization of personnel for merchant fleets both in developed and developing countries should take some serious cognisance of elements of the concept of manpower planning. 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 shipping industry.

Furthermore, these policies must respond as far as possible to the projected and specific needs of the industry as it changes internally and the environment in which it operates as referred to in Chapter II 2:4.

Developing countries, especially those without a long and established history and experience in shipping and more particularly in maritime education and training, such as Trinidad and Tobago, would be very disadvantaged in attempts to gain a share in the current declining shipping climate. Manpower planning, therefore, can become a rather crucial tool in assisting in alleviating some of the possible pitfalls.
CHAPTER III

TRINIDAD AND TOBAGO - AN OVERVIEW

3:1 Geographical Location and Population.

Trinidad and Tobago is a twin island state composed of two main islands i.e the Island of Trinidad and the Island of Tobago and about twenty-three (23) smaller islands and rocks off the coastlines. It has a land area of approximately 5128 square kilometers with Trinidad being 4828 square kilometres and Tobago around 300 square kilometres.

These islands which lie between Latitudes 10.00 N and 11.22’N and Longitudes 60.30’W and 62.00 W are in the Caribbean Sea with Trinidad being on the continental shelf of North Eastern South America. It is separated from Venezuela in the north by the Boca de Dragon which is a passage about seven (7) nautical miles and in the south by the Boca del Sierpe which is about (9) nautical miles. Tobago lies about 22 nautical miles to the north east of Trinidad. The length of the coastline is estimated to be around 500 kilometers. (Figure 2).

The estimated population is about 1.3 million of a multi ethnic and multi-religious background with the principal and official language being English.
Figure 2: Trinidad and Tobago - Geographic Location.
3:2 Economy

The economic system of the country is a mixed one in which the state and private sectors participate. Over the past ten (10) years the economic base was dependent on the very strong performance of petroleum and natural gas production when crude oil production for 1983, 1984 and 1985 was put at 57.62, 61.52 and 64.3 million barrels respectively. Petroleum related products and the raw materials accounted for approximately 24% of the Gross National Product in 1985. However, with the fall in oil prices in the early 1980's there has been a re-evaluation of the economic and development trends.

Other main contributors to the economy include agriculture, fishing, construction, petrochemicals, manufacturing, tourism and services.

3:3 Maritime Affairs

3:3. (i) Introduction

Trinidad and Tobago is involved in a number of maritime related activities. Communication between the islands through the transport of passengers and cargo, marine oil and gas exploration, fisheries, and regional and overseas trade have all resulted in some attention being given to maritime matters. There, however, has been some tardiness in areas such as the updating of maritime legislations, ratification and implementation of some of the I.M.O Conventions and maritime education and training.

Although the Ministry of Works, Settlement and Infrastructure is responsible for principal maritime activities such as policy, maritime safety, ports, shipping, telecommunication, meteorology, international develop-
ments in the maritime field including I.M.O. and also many non maritime activities, other ministries do have subsidiary and shared responsibilities in the day to day operation of various aspects of maritime affairs. The Ministry of Energy supervises oil and gas exploration and production; the Ministry of Food Production, Marine Exploitation, Forestry and the Environment handles Fisheries Research and Exploitation and Hydrography; the Ministry of National Security for Surveillance and assisting in the coordination of Search and Rescue; the Ministry of Legal Affairs for Legislations; the Ministry of Finance for Ship Registration and the Ministry of External Affairs, International Trade and Tourism for all international matters and negotiations.

3.3. (ii) Maritime Safety

The Harbour Master’s Division which falls under the Ministry of Works, Settlement and Infrastructure and operates under the Harbours Act 13 of 1880 as amended in 1949 is responsible for overall maritime safety and lighthouses. In particular, this Division has jurisdiction for advising both the Administration and the public on the safety of navigation within territorial waters; navigation activities; enforcement of all maritime regulation and pollution laws; harbours; issuing of warnings to mariners; search and rescue; examination and issuing certificates of competency to seafarers within the prescribed laws; inspection of ships to ensure the conformation of required safety standards; seafarers' welfare; navigational aids; lighthouses; survey and licensing of nationally owned ships and the keeping of all appropriate records. The Customs and Excise Division which falls under the Ministry of Finance operates under the Merchant Shipping
Act of 1894 with responsibility for casualty investigations; survey of passenger ships; load line inspection and the registration of ships.

The foregoing seems to suggest that some revision and updating of the maritime legislation and the assessment and reassignment of maritime safety responsibilities in light of modern day maritime international practices should be of some priority.

3:3(iii) Ports

The Port Authority of Trinidad and Tobago is a semi-autonomous body which is responsible to the Ministry of Works, Settlement and Infrastructure and operates under the Port Authority Act 39 of 1961. Its main responsibilities are to develop harbours and ports of Trinidad and Tobago; operate port services and collect dues and charges according to the Act. Among the more specific activities are involved the provision and maintenance of all facilities for the entry and berthing of ships; erecting, equipping and maintenance of quays, wharves, jetties, locks and piers; provision of docking facilities, slipways and machine shops; provision of lights and beacons subject to the approval of the Harbour Master and towing, firefighting, water, bunkers, dredging, salvage, repair and such services which would be ordinarily required by a ship entering and leaving port. It has under its jurisdiction tugs, launches, dredgers and passenger/cargo vessels.

Trinidad and Tobago has three (3) public ports at Port of Spain, San Fernando and Scarborough and one (1) private port at Point Lisas. Port of Spain is the main port and handles the bulk of the import and export trade with Scarborough operating as a feeder port for Tobago. San Fernando is not very active at this time and
handles some fishing activities, limited coastal trade and oil exploration interests.

Point Lisas is administered by the Point Lisas Industrial Development Corporation Limited (PLIPDECO) and handles containers, unitized cargo, lumber and bulk items such as iron ore, limestone, scrap iron, anhydrous ammonia, granular urea and methanol.

In addition to these major ports there are many other landing facilities which handle other items such as crude and refined petroleum products, fisheries activities, coastal shipping and pleasure boating.

3:3 (iv) Merchant Shipping

Merchant shipping in Trinidad and Tobago may be categorized as being Coastal, Regional and International.

(a) Coastal Shipping:

This is identified as activities taking place along the coastline and within territorial waters. At the organized governmental level there is the Government Shipping Service which provides passenger and cargo services between the Island of Trinidad and the Island of Tobago. This is currently served by two (2) RoRo car/passenger/cargo ferries operating a twice daily service. One of these is state owned while the other is on charter but will be replaced by another state owned vessel which is now under construction. All crews and support services for these ferries would be national in character.

The Service which is operated by the Port Authority under its Act is separate and apart from the port activities but it is monitored continuously by the Ministry of Works, Settlement and Infrastructure which has
prime responsibility for the Service.

Other vessels ply between the islands transporting products such as lumber, cement, petroleum products and miscellaneous cargo.

The marine oil and gas exploration industry has also generated a supply service and transportation from the main land to oil installations and units consist of supply vessels, tugs, barges, cranes and other work boats.

All these local activities have generated the need for trained and qualified seafarers of various types and levels.

(b) Regional Shipping:

This type of shipping activity is represented not only by the regular import and export trade of products between and among the Caribbean islands but also by the participation of Trinidad and Tobago in the regionally owned and operated West Indian Shipping Corporation (WISCO). The shares in this organization are distributed thus—Trinidad and Tobago (40%), Barbados (10%), Guyana (10%) and the other 40% among the States of Antigua/Barbuda, Belize, Dominica, Grenada, Montserrat, St. Kitts/Nevis, St. Lucia and St. Vincent.

This Corporation was established "to operate and maintain an orderly, adequate, regular and efficient intra regional shipping service to and from participating states". Under Act 17 of 1977 it is also mandated to operate to nonparticipating states within and outside the Caribbean region. WISCO which operates four (4) ships two (2) of which are owned and two (2) on charter belongs to the Florida/Caribbean Association Conference and in Trinidad and Tobago its operations are monitored by the Ministry of Works, Settlement and Infrastructure.
(c) International Shipping:

Trinidad and Tobago has a large volume of overseas trade fueled by a petroleum based economy. However direct involvement in this activity is evidenced by the Shipping Corporation of Trinidad and Tobago Limited (SCOTT) which is a state enterprise under the Ministry of Industry and Enterprise. It is associated with the operation of about ten (10) ships on a time charter basis with services to the United States of America, Canada, Belgium, Denmark, France, the Netherlands, Sweden, the United Kingdom and Japan. The Corporation also provides some brokerage services for customers. It also owns four (4) specialized ships which are on charter to the National Petroleum Marketing Company Limited of Trinidad and Tobago. This fleet is composed of two (2) methanol tankers and one (1) product carrier which operate in the international trade and one (1) Liquid Petroleum Gas (LPG) carrier which operates locally and regionally.

3:3 (v) Fisheries

Fisheries which falls under the jurisdiction of the Ministry of Food Production, Marine Exploitation, Forestry and the Environment can be considered a major maritime activity in Trinidad and Tobago. The industry involves activities in both the territorial waters and the Exclusive Economic Zone (EEZ) and corresponding waters of countries with which Trinidad and Tobago has concluded successful Fishing Agreements.

The industry is primarily artisanal and consists of approximately 3000 vessels of lengths from 4.5 to 12 metres and about 40 trawlers over 12 to 24 meters in
An estimated 7200 individuals may be directly involved as fishermen producing an annual average landing of about 8 million kilograms of fish or about 50% of the country's annual demand. More than 80% of these fishermen operate the smaller type fishing crafts. Operations take place from over 85 beaches and landing points throughout the country with the fishing range of these small crafts averaging about 10 nautical miles from the coastline. Larger vessels operate further offshore even as far as the Brazilian coastline where fishing agreements have been concluded.

The National Fisheries Company Limited (NFC) is a state enterprise which was established in 1972 with the prime functions of processing and marketing of fish and fish products for both the local consumption and export. It is also engaged in commercial fishing with its own trawlers and others on lease from other fishing companies outside of the country. They operate in territorial waters, offshore and in areas where fishing agreements have been concluded and on the high seas. The Company is under the Ministry of Industry and Enterprise with 51% owned by the public sector and 49% owned by the private sector.

3:3 (vi) The Trinidad and Tobago Coast Guard

The Trinidad and Tobago Coast Guard falls under the responsibility of the Ministry of National Security and function in areas such as maritime surveillance, fisheries protection, maritime environmental protection and maritime search and rescue. With respect to the latter the prime responsibility is with the Harbour Master however, in practice it is carried out by the Coast Guard since this organization is equipped with trained manpower, surface
and air transport, communications and other backup facilities capable of covering over 60,000 square miles of sea under the jurisdiction of the Rescue Coordinating Centre which is located in Trinidad and Tobago.

In its search and rescue activities the Coast Guard responded to an annual average of 183 cases between 1979 and 1985 with solutions to an average of 131 per year. An analysis of the cases indicate that the majority of mishaps involved primarily fishing vessels and to a lesser extent pleasure crafts and inter-island trading vessels. It has also been observed that untrained and inexperienced seafarers and unsafe vessels were the major causes of mishaps.

3:3 (vii) Maritime Training

While some attempts have been made to provide some training to the fisheries sector, merchant seafaring has been totally neglected in this aspect on a nationally organized basis. In the latter case training has been limited to that for Able-seamen on a more or less adhoc basis. Some cooperation between the Harbour Master’s Division and the Seamen and Waterfront Workers Trade Union which represents seafarers and utilizing qualified and experienced officers as trainers made this limited training possible. In the first instance classroom space and other facilities were provided at the John Donaldson Technical Institute and more recently at the Caribbean Fisheries Training and Development Institute.

All qualified seafaring officers, as a consequence, must receive education and training outside of Trinidad and Tobago in countries such as the United Kingdom and within the past two years in Jamaica. Candidates may be sponsored by shipping companies, go on their own or
receive scholarship and fellowships from the state.

Shipping interests in the country such as SCOTT, WISCO, the Port, Oil Companies and others have sought to provide training to their seafarers either by sending them abroad or through inservice or apprenticeship training.

Organized education and training in the fisheries sector came into being through the establishment of the Caribbean Fisheries Training and Development Institute by Act 59 of 1975. This organization, located in Trinidad and Tobago, was originally a regional institution with the participation of the Food and Agriculture Organization of the United Nations Development Programme (UNDP/FAO); Trinidad and Tobago (50% of local funding and all infrastructure); Barbados (25% funding) and Guyana (25% funding).

The Institute under the Ministry of Food Production, Maritime Exploitation, Forestry and the Environment was designed "to provide trained manpower to develop and maintain a modern national fishing and shrimping fleet with associated shore management". In this respect emphasis was on the education and training of masters, mates, maintenance mechanics and general crew with the highest level being the British "Second Hand Special" for fishing vessels up to 100 Gross Registered Tons.

The required training took place with the assistance of UNDP/FAO personnel from 1975 to 1977 after which the original operation ceased due to the discontinued participation of Barbados and Guyana primarily through the lack of financial contribution and difficulties in placing the graduates. The training course had a duration of 11 months comprising a total of seven (7) months shore based and four (4) months sea based training. The students were instructed in Coastal and Celestial

Students who were successful in examinations set by the Institute received a Diploma issued by it, while the unsuccessful students received a Certificate of Attendance. The absence of the necessary legislation and machinery to examine and certify these graduates resulted in their efforts and studies receiving no official recognition. However, most graduates were able to successfully complete the requirements for the Motor Launch Captain Certificate of Competency issued by the Harbour Master of Trinidad and Tobago.

The demise of the originally conceived institution has resulted in it being managed on a national basis by the Government of Trinidad and Tobago to provide some education and training for the fisheries and merchant marine sectors; however its effectiveness is still being limited by the absence of updated maritime legislations to take care of adequate training, examination and certification; qualified trainers and funding.

3:3 (viii) Examination and Certification of Seafarers

(a) Introduction

Under present legislations, the Harbour Master’s Division has responsibility for the examination and certification of seafarers. The certificates of competency which now exist are for Able-bodied seamen (AB), Motor Launch Captain and Motor Launch Engineer for ships engaged in the coastal trade and within the Gulf of Paria.
and for Intercolonial Masters, Mates and Engineers for outside of this designated area.

(b) Able-bodied Seamen

The Merchant Shipping (Certificate of Competency as AB) (Trinidad and Tobago) Regulation 1960 made under the Merchant Shipping Act of 1948 lays down the conditions for the examination and certification of seafarers to become Able-bodied seamen. These include areas such as syllabus, seafarers' qualification, age, examination conditions and procedures and issue of the Certificate of Competency. (Appendix I). This Act is a modification of the British Merchant Shipping Act 1894 which was also amended in 1906.

(b) Motor Launch Captain and Motor Launch Engineer

Examination and certification of both Motor Launch Captain and Motor Launch Engineer are regulated by the Motor Launches Act 21 of 1926 and updated in Chapter 18 No. 6 of the Revised Ordinance 1950 relating to harbours and shipping in Trinidad and Tobago. As in the previous case with Able-seamen these legislations have their origin in the British Merchant Shipping Act 1894. Appendix II outlines the conditions applicable to these classes of seafarers.

(c) Intercolonial Certificates of Competency

The conditions relating to the examination and issue of certificates of competency to Intercolonial Masters, mates and Engineers are regulated by Chapter 18 No. 5 Part VI of the Trinidad and Tobago Revised Ordinance
1950 dealing with harbours and ports. An intercolonial ship is defined to "include a ship employed in trading or going between the Island of Trinidad and the Island of Tobago or between some place or places in the Colony and some place or places between the equator and Latitude 28 Degrees North and east of Longitude 90 Degrees West and west of Longitude 50 Degrees West but does not include a coastal ship or a ship employed in trading within the Waters of the Gulf of Paria". Appendix III explains some relevant conditions for examination and certification of these classes of seafarers. (Figure 3).

3:3 (ix) International Maritime Conventions Acqued to by Trinidad and Tobago

As a member of international organizations such as IMO, ILO and United Nations Conference on Trade and Development (UNCTAD), Trinidad and Tobago has some obligation to accede to and put into effect the various conventions adopted by these bodies. As a demonstration of the country's interest, the current Chairman of the Committee on Technical Cooperation of IMO is a citizen of Trinidad and Tobago. This country is also a member of the IMO Council.

There has been some deficiency in the process of putting these conventions into national legislation although some have been acceded to. The unavailability of qualified personnel to effectively evaluate them and the absence of updated legislations may account for some of these problems.
Figure 3: Delimitations for Intercolonial Certificates of Competency.
Conventions acceded to include:

(a) International Convention on the International Organization 1945 as amended. - IMO

(b) International Convention for the Safety of Life at Sea 1972. (SOLAS) - IMO

(c) Convention on the International Regulations for the Prevention of Collisions at Sea 1972. (COLREGS) - IMO

(d) Convention on the Facilitation of Maritime Traffic 1965 as amended. (FAL) - IMO

(e) International Convention on Tonnage Measurement 1969. - IMO

(f) Convention on Load Line 1966. (LL) - IMO

(g) ILO Convention No. 15 - Minimum Age (Trimmers and Stokers) 1921. - ILO

(h) ILO Convention No. 16 - Medical Examination of Young Persons (Sea) 1921. - ILO

(i) The Code of Conduct for Liner Conferences 1979. - UNC-TAD


In addition to the above there are a number of important conventions to which the country is yet to accede to and put into effect and when the economy and
activities in the maritime areas as noted in Chapter III are considered the need for almost immediate action becomes evident. These other IMO Conventions include:


(c) International Convention relating to Intervention on the High Seas in Cases of Oil pollution Casualties 1969. (INTERVETION).

(d) Protocol relating to the Intervention on the High Seas in Cases of Pollution by Substances other than Oil 1973.


Examination and analysis of the foregoing in this Chapter in relation to the economy, the elements comprising maritime affairs and the overall organization of the maritime administration indicate suggestions of anomalies and albeit shortcomings and stumbling blocks in attempts to establish harmonized maritime activities in their roles as engines of economic development and growth. This should more especially be viewed against the backdrop of both the recent downturn in international shipping and the simultaneous rapid technological advances which are continuously being made.

The situation suggests further, that adequate research and knowledge of the short, medium and long term needs of the maritime industry are necessary for proper planning.
4:1 Introduction

As has been suggested earlier, Trinidad and Tobago has indicated a genuine interest in becoming more and more involved in maritime activities. This desire is demonstrated through the direction of the economy and trade; general overall maritime pursuits; an increased attention to the enactment of national maritime legislations guided by international conventions; practical participation in the work of IMO and the training of its nationals at the World Maritime University.

In all these heightened interests in maritime affairs, this country does not differ from sister developing countries of the Third World in seeking to have some measure of control over their trade and other maritime activities.

It is recognized also that a most important input towards the achievement of these objectives is the availability of an adequately trained and deployed manpower resource. However, in obtaining these assets the dilemma may raise its head as to whether the required manpower can be trained nationally, intra-regionally, extra-regionally and/or what combinations would be beneficially acceptable to the state.

It can hardly be disputed that an assessment of the manpower requirements in terms of quantity, quality, availability, trainability and performance is a prerequisite
to the success of the education and training enterprise. However, this itself may be constrained by parameters such as capital and recurrent costs, adequate facilities and equipment, availability of educators and trainers, examination and certification procedures where applicable and relevant primary and subsidiary legislations among other factors.

4:2 Data Acquisition.

A survey and investigation of the shipping industry and the associated manpower, resource and its deployment were attempted through questionnaires, interviews and personal involvement in the field. Contact was made with fifteen (15) national organizations/agencies with maritime interests and responses were received from twelve (12). The observations of this survey relating to Trinidad and Tobago are presented in Tables II to X and Figures 4 to 7 in the section which follows.

4:3 Survey Results:
Table II: Responses of Maritime Organizations Surveyed in Trinidad and Tobago.

<table>
<thead>
<tr>
<th>Maritime Area</th>
<th>Organization</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merchant Shipping</td>
<td>Shipping Corporation of Trinidad and Tobago.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>- West Indian Shipping Corp.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>- Port Authority Trinidad &amp; Tobago.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>- National Petroleum Marketing Co.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>- Amoco Trinidad Oil Co. Ltd.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>- Trinidad &amp; Tobago Oil Co. Ltd.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>- Point Lisas Industrail Port Development Co. Ltd.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>- Trinmar Ltd.</td>
<td>No</td>
</tr>
<tr>
<td>Fisheries</td>
<td>Fisheries Division.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Caribbean Fisheries Training &amp; Development Institute.</td>
<td>Yes</td>
</tr>
<tr>
<td>Hydrography</td>
<td>Hydrographic Division.</td>
<td>Yes</td>
</tr>
<tr>
<td>Examination/ Certification/Safety</td>
<td>Harbour Master’s Division.</td>
<td>Yes</td>
</tr>
<tr>
<td>Catering</td>
<td>Trinidad &amp; Tobago Hotel &amp; Catering School.</td>
<td>Yes</td>
</tr>
<tr>
<td>Education</td>
<td>National Training Board Min. of Education.</td>
<td>No</td>
</tr>
<tr>
<td>Trade Union</td>
<td>Seamen &amp; Waterfront Workers Trade Union.</td>
<td>No</td>
</tr>
</tbody>
</table>

48
<table>
<thead>
<tr>
<th>Ship Type</th>
<th>GRT</th>
<th>No. Operation</th>
<th>Ownership</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Master Mate H/T</th>
<th>Master Mate H/T</th>
<th>Intercol Capt.</th>
<th>Launch</th>
<th>A/B Deck</th>
</tr>
</thead>
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<tr>
<td>Ro/Ro Ferry</td>
<td>1500</td>
<td>1 T'dad-T'go</td>
<td>T&amp;T</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>2</td>
<td>4</td>
<td>Nil</td>
<td>Nil</td>
<td>18 Nil</td>
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<td>Methanol Tanker</td>
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<td>2 Internatl.</td>
<td>T&amp;T</td>
<td>2*</td>
<td>2*</td>
<td>2*</td>
<td>Nil</td>
<td>Nil</td>
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<td>Nil</td>
<td>14* Nil</td>
</tr>
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<td>Product Carrier</td>
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<td>T&amp;T</td>
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<td>1*</td>
<td>1*</td>
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<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>4* Nil</td>
</tr>
<tr>
<td>LPG Carrier</td>
<td>1323</td>
<td>1 Internatl./</td>
<td>T&amp;T</td>
<td>1*</td>
<td>1*</td>
<td>1*</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>3* Nil</td>
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<td>Container/Cargo</td>
<td>1599</td>
<td>2 Miami/Region</td>
<td>WISCO</td>
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<td>Nil</td>
<td>Nil</td>
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<td>4</td>
<td>Nil</td>
<td>Nil</td>
<td>8 Nil</td>
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<td>Tugs</td>
<td>200-300</td>
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<td>Nil</td>
<td>Nil</td>
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<td>Nil</td>
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<td>45 Nil</td>
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<td>Nil</td>
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<td>1</td>
<td>1</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil Nil</td>
</tr>
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<td>Supply Vessel</td>
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<td>4 Coast</td>
<td>USA</td>
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<td>Nil</td>
<td>Nil</td>
<td>4</td>
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<td>Utility Vessel</td>
<td>247</td>
<td>2 Coast</td>
<td>T&amp;T</td>
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<td>Nil</td>
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<td>Nil</td>
<td>Nil</td>
<td>2</td>
<td>Nil</td>
<td>4 Nil</td>
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<td>Line Handling</td>
<td>88-90</td>
<td>2 Coast</td>
<td>T&amp;T</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>2</td>
<td>Nil</td>
<td>4 Nil</td>
</tr>
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<td>Motor Launch</td>
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<td>2 Coast</td>
<td>T&amp;T</td>
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<td></td>
<td>17-32</td>
<td>2 Coast</td>
<td>T&amp;T</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>3</td>
<td>Nil</td>
<td>8 Nil</td>
</tr>
<tr>
<td>Dredger</td>
<td>1811</td>
<td>1 Coast/Harbour</td>
<td>T&amp;T</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>1</td>
<td>1</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil 7</td>
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<td>Barge</td>
<td>1000-2100</td>
<td>4 Coast</td>
<td>T&amp;T</td>
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<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>2</td>
<td>Nil</td>
<td>9 Nil</td>
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<td>Research Vessel</td>
<td>101</td>
<td>1 Coast-200</td>
<td>T&amp;T</td>
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<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>1</td>
<td>Nil</td>
<td>Nil Nil</td>
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<td>Hydrographic</td>
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# Dangerous Goods Endorsement.
<table>
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<tr>
<th>Ship Type</th>
<th>GRT</th>
<th>HP/KW</th>
<th>No. Operation</th>
<th>Ownership</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
<th>Launch Eng.</th>
<th>ER.Rat</th>
</tr>
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<tbody>
<tr>
<td>Ro/Ro Ferry</td>
<td>1500</td>
<td>5600/4119</td>
<td>1 T'dad-T'go</td>
<td>T&amp;T</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>4</td>
<td></td>
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<tr>
<td>Methanol Tanker</td>
<td>8823</td>
<td>4300/3162</td>
<td>2 Internatl.</td>
<td>T&amp;T</td>
<td>2#</td>
<td>2#</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6#</td>
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<tr>
<td>Product Carrier</td>
<td>2757</td>
<td>2400/1765</td>
<td>1 Internatl.</td>
<td>T&amp;T</td>
<td>1#</td>
<td>1#</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3#</td>
</tr>
<tr>
<td>LPG Carrier</td>
<td>1323</td>
<td>1600/1176</td>
<td>1 Internatl./</td>
<td>T&amp;T</td>
<td>1#</td>
<td>1#</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2#</td>
</tr>
<tr>
<td>Container/Cargo</td>
<td>1599</td>
<td>2500/1825</td>
<td>2 Miami/Region</td>
<td>WISCO</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Tugs</td>
<td>200-300</td>
<td>2000-2400/1460-1752</td>
<td>4 Coast/Harbour</td>
<td>T&amp;T</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>6</td>
<td></td>
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<tr>
<td></td>
<td>200-300</td>
<td>4300/3140</td>
<td>1 Coast/Harbour</td>
<td>T&amp;T</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>200-300</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>13</td>
</tr>
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<td>-</td>
<td>-</td>
<td>1 Coast/Harbour</td>
<td>T&amp;T</td>
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<td>-</td>
<td>2</td>
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<td>Supply Vessel</td>
<td>260-300</td>
<td>3000-4000/2190-3360</td>
<td>4 Coast</td>
<td>USA</td>
<td>-</td>
<td>-</td>
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<td>Utility Vessel</td>
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<td>1800/1314</td>
<td>2 Coast</td>
<td>T&amp;T</td>
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<td>Lime Handling</td>
<td>88-90</td>
<td>980/715</td>
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<td>-</td>
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<td>-</td>
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<td>Motor Launch</td>
<td>50</td>
<td>500/335</td>
<td>2 Coast</td>
<td>T&amp;T</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>17-32</td>
<td>650-800/475-584</td>
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<td>T&amp;T</td>
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<td>3</td>
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<td>Dredger</td>
<td>1811</td>
<td>3740/2751</td>
<td>1 Coast/Harbour</td>
<td>T&amp;T</td>
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<td>Barge</td>
<td>1000-2100</td>
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<td>2 Coast</td>
<td>T&amp;T</td>
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<td>Research</td>
<td>101</td>
<td>432/325</td>
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<td>T&amp;T</td>
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Table V: Estimate of Deck Officers Required in Five (5) Years in Trinidad and Tobago.

<table>
<thead>
<tr>
<th>Level of Qualification</th>
<th>No. Required</th>
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<tbody>
<tr>
<td>Class I</td>
<td>9</td>
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<tr>
<td>Class II</td>
<td>9</td>
</tr>
<tr>
<td>Class III</td>
<td>12</td>
</tr>
<tr>
<td>Master Home Trade</td>
<td>25</td>
</tr>
<tr>
<td>Able-bodied Seamen</td>
<td>141</td>
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</table>

Source: Returns from Survey.

Table VI: Estimate of Engineers Required in Five (5) Years in Trinidad and Tobago.

<table>
<thead>
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<th>Level of Qualification</th>
<th>No. Required</th>
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<td>Class I</td>
<td>4</td>
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<tr>
<td>Class II</td>
<td>8</td>
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<tr>
<td>Class III</td>
<td>8</td>
</tr>
<tr>
<td>Class IV</td>
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Source: Returns from Survey.
Table VII: Estimated throughput of Maritime Trainees—1986-1988 in Trinidad and Tobago.

<table>
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<tr>
<th>Area of Training</th>
<th>Year</th>
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<tbody>
<tr>
<td></td>
<td>1986</td>
<td>1987</td>
<td>1988</td>
</tr>
<tr>
<td>Basic Safety for Seafarers</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Ratings Skills Training</td>
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<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Fishermen</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Droughers Crews</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Pleasure Craft Operators</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Port Operation and Management</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Report on Manpower Training Needs of Trinidad and Tobago 1985 - IMO.
Table VIII: Estimate of Vessels and Manpower in the Fishing Industry of Trinidad and Tobago.

<table>
<thead>
<tr>
<th>Vessel Size (Metres)</th>
<th>No.of Vessels</th>
<th>No.of Crew Operating Range (nm)</th>
<th>Power under 5 to 10</th>
<th>over 10 HP/KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 6</td>
<td>500</td>
<td>1000</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Over 6 to 12</td>
<td>2060</td>
<td>6180</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Over 12 to 24</td>
<td>44</td>
<td>264</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Fisheries Division.

Table IX: Estimate of Training Needs for Fisheries in Five (5) Years in Trinidad and Tobago.

<table>
<thead>
<tr>
<th>Area of Training</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Navigation</td>
<td>1500</td>
</tr>
<tr>
<td>General Seamanship</td>
<td>1500</td>
</tr>
<tr>
<td>Echo Sounder</td>
<td>400</td>
</tr>
<tr>
<td>Radar</td>
<td>200</td>
</tr>
<tr>
<td>Radio communication</td>
<td>1500</td>
</tr>
<tr>
<td>Basic Safety for Seafarers</td>
<td>2500</td>
</tr>
</tbody>
</table>

Source: Caribbean Fisheries Training and Development Institute.
Table X: Certificates of Competency Issued by the Harbour master's Division, Trinidad and Tobago, 1981 -1985.

<table>
<thead>
<tr>
<th>Year</th>
<th>Certificate</th>
<th>No. Examined</th>
<th>No. Awarded</th>
<th>Av. Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>Launch Captain</td>
<td>58</td>
<td>40</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Launch Engineer</td>
<td>39</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Launch Captain</td>
<td>154</td>
<td>119</td>
<td>29</td>
</tr>
<tr>
<td>1982</td>
<td>Launch Engineer</td>
<td>65</td>
<td>57</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Launch Captain</td>
<td>76</td>
<td>58</td>
<td>28.5</td>
</tr>
<tr>
<td>1983</td>
<td>Launch Engineer</td>
<td>72</td>
<td>53</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Launch Captain</td>
<td>66</td>
<td>47</td>
<td>29.5</td>
</tr>
<tr>
<td>1984</td>
<td>Launch Engineer</td>
<td>61</td>
<td>42</td>
<td>25.5</td>
</tr>
<tr>
<td></td>
<td>Launch Captain</td>
<td>53</td>
<td>40</td>
<td>24</td>
</tr>
<tr>
<td>1985</td>
<td>Launch Engineer</td>
<td>31</td>
<td>24</td>
<td>26</td>
</tr>
</tbody>
</table>

Source: Harbour Master's Division.
Fig. 4 Examination Record for Launch Captain Certificate 1981-1985

No. Examined

Year

Fig. 5 Examination Record for Launch Engineer Certificate 1981-1985

No. Examined

Year
Fig. 6: Pass/Failure Percentage in Launch Captain Examination 1981-85

Failed 31.0%
Passed 69.0%

Fig. 7: Pass/Failure Percentage in Launch Engineer Examination 1981-85

Failed 30.8%
Passed 69.2%
4.4 General Overview of Survey Data.

In a general overview of the collated data presented above the following initial factors tend to stand out:

(i) the absolute numbers of personnel requiring maritime education and training in certain specific areas may not seem large enough to support the consideration for the establishment of education and training facilities for these separate personnel requirements;

(ii) some results may also not be definitive enough to withstand critical and rigid statistical analyses from which concrete conclusions can be drawn;

(iii) some data may also appear to be conflicting to the point of probably being confusing but this feature seems to follow the general trend experienced in conducting of some types of manpower surveys. Oftentimes, organizations involved in similar or even the same line of activities interpret and respond in varying different ways and forms to the same enquiries.

A closer examination, analysis and interpretation can provide more insight to the existing situation and probably assist to indicate directions for resolution where necessary.

4.5 Analysis of Survey Data.

The data presented in Table III indicate that ships operating in the international trade conformed adequately to international requirements as evidenced by the level of qualification and special endorsements for deck and engineer officers on the product and gas carriers.
Regional carriers seem to have an acceptable level of compliance through the Home Trade Master and Mate Certificates of Competency being offered by Jamaica.

In the coastal trade, however, there seem to be significant diversions from the minimum standards guidelines for training and certification as these relate to vessel size, equipment, capability and operating range and the qualification of the operators. It is observed that the launch captain seems to be performing duties and functions and has responsibilities which seem far beyond those which may be compatible with his required training and expected competency under the existing regulations. The content of the syllabus for the examination for competency as a launch captain tends to bear out this point. Added to this situation is the fact that there is no established education and training system for the merchant seafarer and all officers must obtain qualifications abroad.

Another point of note is that in the particular case of the "launch". It is defined in terms of length only which is a quite acceptable criterion because of the limitation in size. However, in this local setting the vessels which do tend to fall in this generalized category are quite diverse and specialized and the requirements for the launch captain certificate of competency is itself so general that no allowance is made for these differences of type and operating range. There seems at the outset therefore to be some need for either specialized training and/or endorsements to make allowances for this situation.

Consequently, it can safely be argued that facilities currently available for the education, training and certification of deck personnel is inadequate for the jobs which today's seafarers are performing or asked to
perform in today's ship in the coastal waters of Trinidad and Tobago.

Table IV summarizes the situation as regards the engineering Sector. In both general and specific terms the analyses for this group of personnel run parallel to that of the deck personnel in the considerations of availability and adequacy of education and training, certification and examination for the jobs, functions and responsibilities being performed in the maritime industry. As in the deck situation, launch engineers, based on the requirements of the syllabus seem to be attempting to cover areas incompatible with and outside their scope of required knowledge.

Table V gives the returns of the survey relating to the requirement for deck officers in the next five (5) years as perceived by ship operators in Trinidad and Tobago. The question of numbers was raised earlier in this chapter, however, the demand for Classes I, II and III seem to reflect direct replacement of the non-nationals currently employed on nationally owned ships in the international trade. These requirements do not appear to consider aspects of leave of absence, illness, change of jobs, retirement and other factors which can necessitate the filling of these positions. Essentially, therefore, in planning, due consideration should be given to a training target to compensate for the wastage factor which is a natural phenomenon of the job market.

The demands for Home Trade Competency seem to be for the regional trade and the geographical limitation covered under the Intercolonial Master and Mate Certificates of Competency and the larger tonnaged ship operating in the coastal areas. Similar to the immediate above the
issue of wastage remains relevant.

Able-bodied seamen are in demand for all the trades but the level of training and competency may be associated with whether the trade is international, regional or coastal. Also, since this group of seafarers tend to have a greater degree of flexibility and mobility the absolute numbers to be trained may be less easier to predict than in the higher and more specified positions. This predictable greater wastage factor should also be crucial in the planning process.

The information in Table VI can be subjected to a similar analysis as that represented in Table V.

Maritime education and training requirements for Trinidad and Tobago as estimated by an IMO Investigation Team and represented in Table VII also indicates that a diversity of nautical skills are required in the maritime industry. In its recommendations it is noted that this Team made reference to the wider cross section of maritime operations to include merchant seafarers, fishermen, pleasure craft operators and port personnel. The initial impression here is of a more or less "mass" upgrading or education of the lower echelons of practising and potential seafarers especially when the estimated throughput is considered. This latter viewpoint manifests itself again when Table VIII and Table IX which relate to the manpower of the fishing industry and the estimate of training quality and quantity are analysed.

Table X and Figures 4 to 5 show that for the period 1981 to 1985 the Harbour Master’s Division was quite active in examining and awarding certificates of competency to Launch Captains and Launch Engineers.
total of 407 candidates were examined for the launch captain certificate and 304 were successful while 268 were examined for the launch engineer certificate with 203 being successful. In both cases the success rate averaged about 69% while the failure rate averaged 31% (Figures 6 and 7). Most of these individuals are deployed in coastal merchant shipping, fishing, pleasure crafts, privately owned launches and various sectors of the Public Service such as Customs and Excise, Immigration, Harbours, Police, Fisheries and others.

The average age of these individuals is between twenty-five (25) and twenty-nine (29) years and this may indicate the importance and need for these qualifications to both employer and employee.

4.6 Conclusion

When the information gathered from the general observations and more detailed analysis of the survey data; the findings of the IMO Consultants and the author's personal experience are taken into consideration, the embarkation of Trinidad and Tobago into the area of maritime education and training would tend to be influenced by combinations of the undermentioned parameters. At the same time the queries concerning absolute and finite numbers if each specific industry is to be trained separately should be borne in mind. Also there is the factor of the quality of the survey returns which has been raised earlier.

These parameters refered to include:

(i) the qualifications of maritime personnel need some improvement.
(ii) there is conformity to standards of qualification at the international and regional levels however, the discrepancies at the local level are too wide and varied and so need some immediate attention.

(iii) there is a general consensus that the current maritime personnel are undertrained and underqualified for the jobs and responsibilities allocated to them.

(iv) there is need for at least upgrading of existing personnel if not formalized maritime education and training.

(v) the examination and certification system and procedures for seafarers require refurbishing, reorganizing and updating.

(vi) the more qualified and renumerative positions are held by non nationals.

(vii) all interests as represented by owners, operators, government agencies and the seafarers themselves do agree that the safety of shipping is dependent on properly educated and trained maritime personnel.

Consequent upon the general observations made above, which have come out of the survey and other sources, Trinidad and Tobago in considering the putting into effect a maritime education and training system should proceed to establish guidelines based on stated objectives and devise a philosophy and process through which these objectives can be achieved and then put into place the appropriate infrastructure to implement the system.
PART II: THE ENGLISH SPEAKING CARIBBEAN

The present survey from countries of the English Speaking Caribbean Region, all of which are members of the Caribbean Community and Common Market (CARICOM), did not elicit the kind of response which can permit the drawing of meaningful conclusions regarding the manpower supply and demand of their maritime industries. Table XI shows that of the nineteen (19) regional organizations/agencies contacted responses were received from six (6). Those singled out as being most important from which replies were not received were the Jamaica Maritime Training Institute, and the Organization of Eastern Caribbean States (OECS).

The returns from the Fisheries interests as shown in Tables XII to XVI are quite similar to those received from Trinidad and Tobago. This resemblance begs the inference that the fishing industries of these states may have probably undergone a development process common to the region, thereby resulting in what appears to be a parallel structure at the present time. The interpretations applied to the training requirements of the Fisheries Sector of Trinidad and Tobago can safely be used for those of Barbados, Guyana and St. Lucia under consideration in this section.

In other areas the maritime education and training requirements of seafarers would have to be inferred primarily on such grounds that these are all island states who are members of IMO and involved in trade not only among themselves through CARICOM and WISCO but with the world at large. In addition it is expected that like other developing countries they would also have that ambition of having some measure of ownership and control over their
shipping and trade. Table XVII gives the status with IMO of these Caribbean States. In addition at least three (3) of these countries do encourage and support the Open Registry for ships.

In the specific area of maritime education and training, the Jamaica Maritime Training Institute has been serving the region in this field through the training and certification of mostly Nautical and some Engineering Officers. This gesture has had the effect of relieving other states from immediate investment at this level of activity since there is free access for those who meet the stipulated qualifications. (See Appendix IV). It has been reported that in 1985/1986, of the fifty-five (55) students at the Institute, forty-eight (48) were from Jamaica, four (4) from Trinidad and Tobago, two (2) from Guyana and one (1) from Barbados. From personal knowledge many more individuals from the region have been examined and certified without undergoing the formal training at the Institute but due to the lack of response there is no quantitative representation.

In conclusion, in spite of the somewhat reasonable inferences which may be made in relation to manpower supply and demand and the consequential impact on the education and training direction of the region, scholarship demands better and more comprehensive information on the maritime industry before more precise views can be expressed.
<table>
<thead>
<tr>
<th>Maritime Area</th>
<th>Organization</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and Training of Seafarers</td>
<td>Jamaica Maritime Training Institute</td>
<td>No</td>
</tr>
<tr>
<td>Examination/Certification/Safety</td>
<td>Harbour Master, Barbados.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Harbour Master, Grenada.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Harbour Master, Dominica.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Harbour Master, Guyana.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Harbour Master, St. Lucia.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Harbour Master, St. Vincent.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Harbour Master, Jamaica.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Jamaica Marine Board.</td>
<td>Yes</td>
</tr>
<tr>
<td>Fisheries</td>
<td>Fisheries Division, Barbados.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Fisheries Division, Guyana</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Fisheries Division, St. Lucia.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Fisheries Division, Bahamas.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Fisheries Division, Grenada.</td>
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</tr>
<tr>
<td></td>
<td>Fisheries Division, Dominica.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Fisheries Division, Jamaica.</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Fisheries Division, St. Vincent.</td>
<td>No</td>
</tr>
<tr>
<td>Regional Organizations</td>
<td>CARICOM Secretariat, Guyana.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Organization of Eastern Caribbean States, St. Lucia.</td>
<td>No</td>
</tr>
</tbody>
</table>
Table XII: Estimate of Vessels and Manpower in the Fishing Industry of Barbados.

Source: Fisheries Division.

<table>
<thead>
<tr>
<th>Vessel Size</th>
<th>No. of Vessels</th>
<th>No. of Crew</th>
<th>Operating Range (nm)</th>
<th>Power (HP/KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 6</td>
<td>100</td>
<td>200</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Over 6-12</td>
<td>480</td>
<td>960</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Over 12-24</td>
<td>20</td>
<td>60</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table XIII: Estimate of Training Needs for Fisheries in Five (5) Years in Barbados.

<table>
<thead>
<tr>
<th>Area of Training</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Navigation</td>
<td>40</td>
</tr>
<tr>
<td>Seamanship</td>
<td>40</td>
</tr>
<tr>
<td>Echo Sounder</td>
<td>40</td>
</tr>
<tr>
<td>Radar</td>
<td>40</td>
</tr>
<tr>
<td>Radio Communication</td>
<td>40</td>
</tr>
<tr>
<td>Basic Safety for Seafarers</td>
<td>40</td>
</tr>
</tbody>
</table>
Table XIV: Estimate of Vessels and Manpower in the Fishing Industry of Guyana

Source: Fisheries Division.

<table>
<thead>
<tr>
<th>Vessel Size</th>
<th>No. of Vessels</th>
<th>No. of Operating Range (nm)</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>under 5 to 10</td>
<td>over 10</td>
</tr>
<tr>
<td>Over 6 to 12</td>
<td>1231</td>
<td>3200</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 12 to 24</td>
<td>129</td>
<td>900</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 24</td>
<td>133</td>
<td>530</td>
<td>-</td>
</tr>
</tbody>
</table>

Table XV: Estimate of Training Needs for Fisheries in Five (5) Years in Guyana.

Source: Fisheries Division.

<table>
<thead>
<tr>
<th>Area of Training</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Navigation</td>
<td>150</td>
</tr>
<tr>
<td>General Seamanship</td>
<td>150</td>
</tr>
<tr>
<td>Echo Sounder</td>
<td>500</td>
</tr>
<tr>
<td>Radar</td>
<td>300</td>
</tr>
<tr>
<td>Radio Communication</td>
<td>300</td>
</tr>
<tr>
<td>Basic Safety of Seafarers</td>
<td>2000</td>
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</tbody>
</table>
Table XVI: Estimate of Vessels and Manpower in the Fishing Industry of St. Lucia.

Source: Fisheries Division.

<table>
<thead>
<tr>
<th>Vessel size</th>
<th>No. of Vessels</th>
<th>No. of Crew</th>
<th>Operating Range (nm)</th>
<th>Power HP/KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 6</td>
<td>30</td>
<td>60</td>
<td>Under 5 to 10</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Outboard Motors.</td>
</tr>
<tr>
<td>Over 6 - 12</td>
<td>650</td>
<td>1950</td>
<td>+</td>
<td>+ + +</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Given.</td>
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</tbody>
</table>
Table XVII: IMO Conventions, Amendments and Protocols Receiving at Least Signatures by Some English Speaking Caribbean States.

<table>
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<th></th>
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<th></th>
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<tr>
<td>IMO 1974</td>
<td>+</td>
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<td></td>
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<tr>
<td>SOLAS 1974</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>SOLAS 1978</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
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<tr>
<td>L L 1966</td>
<td>+</td>
<td>+</td>
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<tr>
<td>L L 1971</td>
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<td>+</td>
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<td></td>
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<tr>
<td>L L 1975</td>
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<td>+</td>
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<tr>
<td>L L 1979</td>
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<tr>
<td>L L 1983</td>
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<td>COLREG 1972</td>
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<td>STCW 1978</td>
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<td>FAL 1965</td>
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<td>MARPOL 73/78</td>
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<td></td>
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<tr>
<td>I&amp;II</td>
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<td>+</td>
<td></td>
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<td>III</td>
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<tr>
<td>IV</td>
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Table VII: (Continued).

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(*)- See Appendix VII for Abbreviations for Conventions.

(*)- Interpretation of Abbreviations for States.

- Ant./Barb. — Antigua/Barbuda.
- Barb. — Barbados.
- Gren. — Grenada.
- Guy. — Guyana.
- Jam. — Jamaica.
- St.Vin. — St.Vincent.
- St.Lucia — St.Lucia.

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CHAPTER V

SOME CONSIDERATIONS IN THE APPLICATION OF A MANPOWER STUDY APPROACH TO MARITIME EDUCATION AND TRAINING

PART I: TRINIDAD AND TOBAGO

5:1. Introduction.

In the process of giving due consideration to the application or utilization of a manpower study approach to maritime education and training, there are many quite serious and realistic situations which must always be borne in mind. At the same time they should never escape the horizons of the planner whenever predictions/projections are being suggested for possible implementation. These obtain whether it be for the maintenance and continuation of an established system in a developed maritime nation or if a new system is being put into place. As far as practicable these factors are acknowledged and are given appropriate awareness in applying the approach to Trinidad and Tobago.

5:2 Some Influences in the Implementation of Manpower Planning Studies.

Some characteristics of a manpower planning approach which can interplay and so influence either positively or negatively the credibility gap between the accuracy of predictions and reality and possibly impose some limitations on the planner may include the
following :-

(i) - a manpower study attempts to predict the future and even under the best of circumstances this can be a most difficult if not impossible task at times.

(ii) - the approach assumes to a great extent that past and current trends of the parameters used would continue for some time into the future and may also attain some degree of constancy. This may not be always so and the local scenario can become more difficult and confusing when unpredictable involving social, economic, political, technological and financial dimensions come into play in varying combinations and time frames. In their own ways and circumstances individual or combinations of these unpredictable may operate as overriding factors even though may be a high degree of initial accuracy in the planning projections.

(iii) - various external and environmental factors even far away from the local scene of activity can also have influences on the process.

(iv) - influences can also arise in very dynamic situations like the maritime industry where there are so many actors and diversity of interests which may tend to operate in such a manner as to optimize their own participation and returns to satisfy their own ends.

(v) - the data base utilized may at times prove the
undoing of a manpower study since returns and information may suffer from suspect adequacy, accuracy, reliability and dependability which may be variously affected by differential interpretation of questionnaires and enquiries, secrecy, non-response and other elements.

(vi) - the method of acquisition and analysis of data may be affected by whether emphasis is on systematic scientific approach or a judgemental one.

(vii) - interpretation of data may differ from analyst to analyst depending on varying circumstance and influences such as personal experiences, approach and objective, social, political, economic and others.

(viii) - at times only trends may occur rather than positive definitive conditions and this should be appreciated and recognized by the planner.

Notwithstanding all that have been listed above, these observations do not in anyway presume to discredit or for that matter underestimate the usefulness and oftentimes absolute necessity for some form of manpower study in the planning process difficult though it may be in predicting the future and narrowing the credibility gap. On the contrary it may be taken for granted that a proven and established systematic scientific method or even some measure of judgemental approach would frequently be much better for the planning process than none at all. This latter consideration would more likely lead to the identification of possible pitfalls and shortcomings and so provide an avenue for making adjustments if

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necessary. In addition the planner can always be on the alert for those predictable and unpredictable circumstances which are always present to affect the planning in either way.

5:3 The World Shipping Scene in the Application of a Manpower Study to Maritime Education and Training in Trinidad and Tobago.

It is in the above recognized realities and lights that the manpower planning approach would be applied to the case under study. In so doing, however, UNCTAD (1986) in its report on "Major Issues in World Shipping" made some observations worthy of note which can be used as a backdrop. Among these observations are:

- one of the most pervasive characteristic of world shipping during the last decade has been a large and continuing imbalance between the demand for and the supply of tonnage, which is by now affecting practically all sectors of world shipping.

- in addition, most authoritative market forecasts now agree that international trade and hence the requirement for tonnage would not increase in the foreseeable future.

- a return to a more balanced situation between supply and demand in world shipping will require a series of measures to be taken simultaneously in different areas and involving all parties concerned, in particular, governments and inter-governmental organizations and representative organizations of shipowners and operators, shipbuilders, labour unions and ship financing sources.
Separate action by individual governments and interest groups is not likely to be fully effective. Consultation and cooperation between governments and private interests on an ongoing basis is also essential.

- the recession in world shipping during the last decade has not resulted in a notable transfer of tonnage to developing countries.

- the prolonged situation of subsidized overcapacity and instability in world shipping markets has been a major setback for long term planning of merchant fleet development in developing countries. Monopolistic practices which restrict access to cargo in certain trades continue to be an important factor inhibiting participation by developing countries in bulk shipping.

5:4 Some Specific Elements in the Application of a Manpower Study in Maritime Education and Training.

(i) Introduction.

The survey results and analyses in Chapter IV Part I have given some indications as to the manpower supply and demand in the maritime industry of Trinidad and Tobago. In these indications the limitations of the data and statistics are acknowledged and borne in mind. At the beginning of this current chapter are also outlined some influences which may feature in affecting both the planning and implementation processes. All these therefore, would have some bearing or direction on those elements which merit attention in the application and implementation of the manpower planning to maritime education and training. Furthermore, these elements should not be looked
at solely as avenues for arriving at a specific number of trained personnel but also in a systems concept where they may be supportive and or interlocked in the process of meeting the manpower demands as the various influences interact. Among these specific elements referred to are:

(i) The Maritime Education and Training Objectives.


(iv) The Maritime Education and Training Infrastructure.

5:5 Maritime Education and Training Objectives of Trinidad and Tobago.

The objectives of maritime education and training may vary from country to country. In one approach they may tend to lay emphasis on preparing the individual for national statutory requirements or meet international standards in the safe operation of ships and protection of the environment. On the other hand, the administration may opt to educate and train the individual so that in addition to the above his socio-economic situation and consequently his role in the maritime industry is taken into consideration.

Furthermore, the maritime industry may be considered as a composite unit encompassing and integrating the different sectors such as merchant shipping, port operations, fisheries, exploration of non-renewable resources and shore base operations. The objectives of the system should naturally be reflected in the maritime education and training philosophy.
Trinidad and Tobago, although it has had some limited experience in fisheries related training is now faced with considerations for a wider approach to maritime education and training. The country can, nevertheless, be thought of as a new entrant into this field especially when an organized system with all the supporting elements is being done. Chapter III Section 3:3 outlines the status of the country’s maritime affairs and in particular its maritime education and training activities to date.

The Trinidad and Tobago objective in maritime education and training should be directed at one whereby the maritime industries and activities are considered together. This approach may be supported by the following considerations among others:

- both the sizes of the country and the population are small and do impose limitations in a variety of ways.

- the types of maritime activities are somewhat varied to include merchant shipping, fisheries, marine gas and oil exploration, ports and shore based operations. In a general broad based viewpoint the trend would indicate the need for some education and training, however, if the need of each sector is to be isolated and considered individually and so treated the absolute numbers of personnel required would not probably justify on a strict cost benefit evaluation the application of separate training strategies.

- the survey returns seem to suggest a type of mass training/upgrading which crosses all the maritime interests at what appears to be rather similar levels of minimal education and training since common deficiencies have been noted.
- The required education and training levels and numbers seem to be imposing upper limits in the short and medium terms for both national and international requirements.

- Both fisheries and marine oil and gas resources have important socio-economic roles in terms of employment, food and local and foreign earnings. These sectors therefore, do merit important considerations in the exercise.

- It can be assumed that shore-based personnel would be required at all levels to cope with the different and varied maritime interests and consequently they should be adequately trained with the appropriate attitude, disposition and appreciation of the country'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.

- The training of seafarers for the international trade and employment on foreign ships is not in great demand and this should be taken in context of both the country's lack of experience in this venture and the world shipping situation as observed by UNCTAD (Chapter V Section 5:3) and other sources.

- Today's trend towards integrating the maritime education and training system with the general education system backed up by the "Front end" approach to education and training of maritime personnel is another factor which can help to define the objectives of Trinidad and Tobago.
the perennial issues of the availability and the allocation priority of funds can have impacts on the planning process and so affect the determination of objectives.

5:6 A Maritime Education and Training Philosophy for Trinidad and Tobago.

With the determination of objectives attention can be turned to the devising of a philosophy on maritime education and training.

The general education system should show some reflection in the maritime education and training system such that potential candidates and trainees for the maritime industries should use qualifications and training gained through the general education system as major recruitment criteria to enter the maritime professions comparable to the situation which exists for other industries. In so doing the opportunity can be created for the academically inclined candidates to be able to both cope with the education and training materials and reaching the higher levels of qualification and certification as required by national and international standards.

The absence of established systematic maritime education and training in Trinidad and Tobago has so far obviated this type of recruitment process and consequently can be one contributing factor to the somewhat low level of qualified personnel currently in the industry.

Figure 8 outlines the general education system in Trinidad and Tobago from the starting age of five (5) years of age to the highest university qualification. The basis is derived from the British system of education which was
Figure 8- Outline of the General Education System in Trinidad and Tobago.
inherited after about one hundred and sixty-five years of British colonial rule. There have been modifications throughout the past twenty (20) years.

At the lower levels of the system note should be taken on the emphasis on technical education and training as evidenced by the establishment of technical vocational institutes, youth camps and an agricultural training institute to meet the manpower demands of the relevant industries. The maritime industry has never been accorded this status and its inclusion on a similar basis is a proposal worthy of consideration.

In making reference to the above, Trinidad and Tobago should remain ever conscious of the trend of the developed and developing maritime nations in gradually but consistently moving in the direction of providing multipurpose training for their seafarers and the integration of their maritime education and training system with their general education system by way of technical institutes, colleges and universities. This is more in response to the demands of the industry.

The above has lead to the promotion of a system of maritime education and training whereby current day seafarers operating on modern sophisticated ships are afforded the opportunity to obtain academic qualifications, for example, Diploma; B.Sc. or M.Sc. in Engineering or Nautical and Marine Sciences along with seagoing qualifications. This provides the seafarer with the educational background and qualification to be employable both at sea and ashore.

It is not the direct suggestion here that the country should unreservedly adopt this new trend since its national fleets are composed of many old and traditional unsophisticated ships which would be in service for a long time yet. Furthermore, multipurpose training is
ideally suited for newer ships dedicated to accommodate this type of crew. Nevertheless, the trend is indicative of the direction of the industry and in examining its national objectives and requirements and the means of achieving them the international forum and its changing scenes should always be borne in mind.

5:7 Maritime Education and Training and the STCW in Trinidad and Tobago.

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 Organization 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.

Trinidad and Tobago is therefore well advised to utilize this acceptable and functioning vehicle on its way to establishing its own education and training system. Notwithstanding aspects which may be considered mandatory, there is enough flexibility built into these guidelines and standards for their application to both national and international requirements. It does not dictate absolute details on such issues as academic entry qualification, number and structure of examinations and certificates of competency, institutional training period and other areas which can operate as serious constraints to some countries which are desirous of adopting the Convention and putting it into effect.
Appendix VII reproduces elements of the Convention as these relate to Deck and Engineering training.

5:8 Proposals on a Certificate of Competency Structure for Trinidad and Tobago.

5:8.(i) International Certificates of Competency.

With the view to suggesting further on in this document elements of the education and training system which are crucial to the delineation of the training process and and programmes, institutional framework, upgrading and other integral related sectors, it becomes necessary to be aware of the levels to which the education and training are to be targeted. In essence this would mean a determination of the number of certificates of competency, their different levels and the procedures to achieve them. However, as noted in the Preface of this document, the details of this process seem to be the prerogative of the Examination and Certification Authorities guided by the policies of the Maritime Administration and are areas which would not be investigated deeply here although its importance is acknowledged. To this end therefore, only broad indications, enough to serve the present purpose would be attempted.

As an independent developing State with shipping interests and ambitions, Trinidad and Tobago would probably like to strive towards producing the highest levels 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 this group of seafarers, as referred to in Section 5:7 of this Chapter, guidance can be gathered from
the STCW (1978). Here, the concept to a structure can safely reflect those implied by the Convention through the education and training suggested in terms of subject materials, sizes of ships and areas of operation for the international trade. For example, the structure for deck personnel to include Master, 1st.Mate, 2nd.Mate, 3rd.Mate and Able-bodied Seaman can be applied in principle although the Administration would have the option to decide on numbers of certificates, examinations and so on. A similar method is applicable to the areas of engineering and communications. Again reference can be drawn from the British System under whose Shipping Act the Country has operated since 1894.

5:8 (ii) Certificates of Competency for Local Operations.

Whereas the above approach may be applied in a more or less straightforward manner in dealing with internationally recognized certificates of competency the situation regarding local conditions would require close scrutiny and examination so that varied and peculiar situations are fully considered to coincide with the issue of appropriate certificates.

Observations made earlier in Chapter III with special reference to syllabus, examinations and certification and also the interpretations presented in Chapter IV Part I all seem to suggest the needs for the updating of this sector. Here also, the preference would be weighted towards modification and building on the existing structure rather than attempting to introduce a completely new one. The structure should utilize inputs drawn from the survey and the experiences of other administrations in items such as areas of operation, types and sizes of ships, nature of operations, qualifications of existing and
required personnel along with their duties and responsibilities and relevant assumptions and projections.

Under a Trinidad and Tobago Maritime Administration two broad categories of certificates of competency can be proposed. The first would be aligned to the original Intercolonial Certificates of Competency regulated by Chapter 18 No. 5 Part IV of the Trinidad and Tobago Revised Ordinance 1950. (Appendix III). Some guidelines recommended for this category would include:

- the area of operation: the area would be that covered by the above regulations—"a ship employed in trading or going between the Island of Trinidad and the Island of Tobago or between some place or places between the equator and latitude 28 degrees North and east of longitude 90 degrees West and west of longitude 50 degrees West, but does not include a coastal ship or a ship employed in trading within the Waters of the Gulf of Paria.

- sizes of ships: a tonnage within the ranges of those cargo, passenger and special and specially equipped ships operating in the designated area while bearing in mind some relationship with the STCW 1978 Convention.

The certificate structure and the procedures for acquiring them should be such that holders can move into the international category with the required training, examinations, seatime, endorsements and other conditions stipulated by the administration.

The other category of certificates of competency which is being proposed should be related to the following criteria:

- area of operation: in the territorial waters of Trinidad and Tobago in those areas not covered by the limitations set by the category above.

- sizes of ships: these should be of lesser tonnage
and or length than those operating in the first area yet having some relationship with the trade and activities under consideration.

Existing legislations: modifying and updating the regulations and conditions pertaining to the current Certificates of Competency for Launch Captains and Launch Engineers under the Motor Launch Act 21 of 1926 and updated in Chapter 18 No.6 of the Revised Ordinance 1950 relating to Harbours and Shipping in Trinidad and Tobago. (Appendix III).

Similar to the previous case the structure should put the holders in a position to move up to the next category according to the requirements laid down by the administration.

5:8 (iii) Endorsements.

In all categories of certificate structure, there should be arrangements for endorsements to accommodate the varying types of ships and operational peculiarities and it is noted that in the local trade there exist tugs, barges, dredges, launches, passenger ships, supply boats to marine oil installations, chemical and gas carriers and others.

5:8 (iv) Fisheries.

In general, the approach to a certificate of competency structure for the fisheries sector varies quite widely from country to country and there are many in which there is none. This may have been influenced partially by the delay in the implementation of the Convention on the Safety of Fishing Vessels (SFV) 1977 although local administrations do have the authority and
responsibility to make their own regulations and many have done so.

In Trinidad and Tobago, the type of fishing activity is primarily artisanal as the survey results indicate. Operations are carried out in small open crafts under 12 metres in overall length and rather close to the coast. Whereas instructions and information on operational safety would be very highly recommended because of the interaction of fishing vessels with other shipping and vessel traffic a certificate structure appears to be somewhat problematic.

Among the other group of fishermen who operate the larger crafts over 12 metres, the proposition of a structure to make provisions for fishing masters, mates, deckhands and engineers holds more promise.


Proposals for a maritime education and training process in Trinidad and Tobago are considered in light of the limitations set in Section 5:8 and within the context of the related comments on the Preface.

Most, if not all developing countries may entertain ideas of providing the entire range and levels of education and training for its maritime personnel, however in realistic terms there may be limitations and restrictions which dictate otherwise and compromises would result.

In Trinidad and Tobago these limitations and restrictions do exist. While in the very long run there may be need to educate and train the highest level of international maritime personnel required, in the short and medium terms this does not seem advisable when the
The apparent needs are being presumed on the grounds that there is an absence of formalized education and training, the lack of updating of the syllabus and examination requirements and procedures to meet modern day guidelines and standards, the delay in modernizing relevant local maritime legislations and the putting into effect of the STCW and also the observation that
many of the personnel operating in the local industry seem to be performing duties and responsibilities which are incompatible with their education training and experience. These upgraded personnel would need to be certified according to the relevant regulations.

In addition to the proposed upgrading process there is need for a new institutionalized and formalized approach to maritime education and training in light of the observations made throughout this study. The following proposals are recommended in suggesting the implementation of the process:

- academic entrance qualification for maritime personnel to maritime education and training institutions or training programmes should be closely linked to the general education system as is the case with other industries. This could therefore lead to qualifications gained by these individuals being recognized and appreciated within the general socio-economic system. An adequate academic background would present more opportunities for the individual to achieve the highest levels of qualification.

- all trainees and candidates for nautical, engineering and fisheries education and training should successfully undergo a mandatory Pre-Sea Training Course prior to proceeding to higher levels of training.

- the Pre-Sea Training Course should be of a general purpose or integrated nature whereby all trainees are given training in both nautical and engineering areas and the required safety instructions. This approach in addition to illustrating the need for flexibility also recognizes the changing requirements of the maritime industry.
- adequate sea time should be provided, preferably supervised on training vessels during the Pre-Sea training period so that trainees can be properly assessed on their sea going aptitude prior to proceeding beyond this level.

- beyond the Pre-Sea training and depending on the maritime industry i.e. merchant shipping, fisheries or oil and gas exploration; the level of operation i.e. coastal or intercolonial/regional and the area of specialization i.e. deck or engineering; the examination and certification authorities would specify particulars with regard to academic training, sea time, endorsements and so on.

5:10 A Proposed Maritime Education and Training Infrastructure for Trinidad and Tobago.

5:10 (i) Introduction.

It is rather axiomatic to suggest that the institutional framework serving the maritime education and training system should be such in its structure, operation and management that it can adequately and capably meet the major objectives of that system. In this way it would be able to produce personnel who would satisfactorily meet the standards of education, training and competency laid down by examination and certification authorities and other bodies operating under the aegis of the maritime administration and/or the general education system.
In Trinidad and Tobago, at the outset, in order that the objectives of the education and training system can be achieved, the institutional framework should have that capability of handling the requirements of that system. The limitations and constraints as observed in the survey and referred to earlier are factors which should be put into perspective in the setting of boundaries and guidelines in the development and operation of the framework.

A pivotal maritime education and training institution is a primary requirement; however, the contribution and involvement of already existing institutions, organizations, and agencies which can be complementary and supportive should be examined with regard to their ability and role in participating in the education and training process in the meeting of the objectives. With the appropriate organization, management, and cooperation, this arrangement can assist in the building in of a great degree of flexibility in the education and training process, minimizing the duplication of personnel, facilities, and equipment thereby promoting their fuller utilization, encouraging a more efficient utilization of funds, assist in integrating maritime education and training in the general education system, raise the level of social and economic consciousness of the role and value of the maritime sector in national life, assist in promoting the role of maritime personnel in the society and other unforeseen spinoffs.

5:10 (ii) The Pivotal Institution.

The pivotal institution hereby referred to as the "Trinidad and Tobago Maritime Institute" (TTMTI), which should have the prime responsibilities for implementing
and overseeing all the maritime education and training programmes. This is necessary if the suggested objectives are to have a good chance of being achieved. Furthermore the institution should possess and reflect some special characteristics in its organization, management and operation.

5:10 (iii) The Parent Ministry to the Pivotal Institution

The parent ministry of the TTMTI should be the Ministry of Works, Settlement and Infrastructure which is responsible for all transport including maritime transport, general maritime safety, ports and IMO matters. (Chapter III Section 3:3). Even with the involvement of fisheries and oil and gas interests greatest focus will be on maritime safety and its attendant implications which will include nautical, engineering, safety and environmental matters in all the sectors and interests. Another strong supporting factor is the presence of a junior minister in this Ministry whose primary responsibility is maritime matters.

The ministry responsible for Education has had no role nor experience in the maritime field as evidenced by the gap between the general education and maritime education. In the short and medium terms plus the current state of world shipping its handling of these new and additional responsibilities seem rather onerous. This point is made notwithstanding the fact that in some more advanced maritime countries this ministry plays a vital role in the maritime education and training process.

On the other hand the ministry with the responsibility for Fisheries although it has a little experience in the operation of fisheries training is not traditionally from investigations, the most recommended or
suitable for the handlining of merchant shipping and safety matters. In addition it does not seem to have the focus, experience, breadth, interest and status to be the parent ministry for this type of activity.

5:10 (iii) Proposed Organizational Structure of the Pivotal Institution.

(a) External Management:

The rather broad-based education and training responsibilities of the pivotal institution as indicated through the objectives of the maritime education and training system suggests that in its organizational structure it should be involved all those interests who have inputs and contributions to make in the process of achieving the objectives. Ideally, this is necessary to ensure that there is not only the presentation of the different views and opinions but also the provision of checks and balances which become necessary in dealing with the continuous dynamic changes which occur in the maritime industry. These factors are recognized notwithstanding the possibilities that too large a management group can be counterproductive in that too wide a diversity of groups and interests can impose handicaps to decision making and efficient management.

For the purposes of this discussion the participants comprising the proposed external management team would be referred to as the "Management Committee" and the recommended representations should be drawn from the following organizations and agencies:

- the Ministry of Works, Settlement and Infrastructure
re in particular from the Harbour Master's Division, the Ports and the General Maritime Administration.

- the Ministry of Food Production, Marine Exploitation Forestry and the Environment with special reference to the Fisheries Division and Fishermens' Representative.

- the Ministry of Finance and Planning.

- the Ministry of Education with particular reference to the Vocational Training Section.

- the Ministry of National Security through the Trinidad and Tobago Coast Guard.

- Shipping Interests to include Shipping Companies, Owners and Operators.

- Trade Union representing Seafarers.

- Head of the Maritime Training Institution.

This Management Committee which would operate "externally" with reference to the day to day "internal" functioning of the Institute should be responsible to the "Parent Ministry" for the proper management and operation along set guidelines and objectives which would have issued from policies laid down by the Maritime Administration and Legislations. The ultimate responsibility will rest with the Minister with the responsibility for overall national maritime matters.

In all these considerations it is important that the Institute and its Management be accorded a reasonable measure of autonomy in operation practices so that they
can cope and adjust to factors such as staffing, rapid changes in the industry, reallocation of funds as this may become necessary in responding to the industry, reconsideration of education and training strategies, acquisition and updating of relevant training equipment and aids and many other facets which can become very difficult and at times virtually impossible to resolve if routine public services' decision making and management procedures are allowed to dominate. Also the terms of reference and operating scope should be such that a certain amount of generalities and flexibility are built in to give the organization room to manoeuvre and not subject to too tight a control. A precise and restrictive approach to control can seriously affect performance in a scenario such as the maritime industry.

(b) Internal Management.

The "internal" management of the Institution should also reflect the operational responsibilities as policies and guidelines laid down through the Management Committee are implemented. The head of the Institute who also serves on the Management Committee would be responsible for the internal structure and day to day management. This proposed structure should comprise the elements of nautical, engineering, fisheries and institutional administration all of which have been identified both through the survey and the education and training objectives. The degree of interaction and inter-relationship between the different divisions and personnel would depend on the internal management style in place and would not form a part of this presentation in detail however the importance of the smooth working and near perfect coordination of these sectors cannot be
over estimated if success is one of the true goals.

In Trinidad and Tobago, in the short and medium terms, this proposed organizational structure (Figure 9), taking into consideration the composition of both the "external and internal" management should provide a basis for effecting the objectives of the maritime education and training system.

5.11 Supportive Institutions to the Maritime Education and Training Infrastructure.

There are already existing institutions, some within the general education system which can be supportive to the pivotal institution and consequently in the maritime education and training process. The broad rationale as to their value and roles has been sated previously.

Most immediately obvious among those associated within the general education system would be support in the fields of engineering education, training of radio/communication personnel and catering.

5.11 (i) Engineering Related Facilities.

In the area of engineering there are two Technical Training Institutions- the John Donaldson Technical Institute which serves the northern part of Trinidad while the San Fernando Technical Institute serves the southern part of the island. Both institutions offer two (2) to three (3) year full time training courses in Mechanical/Production Engineering Technical Training, Welding Craft Practice and Machine Shop Craft Practice under the Department of Mechanical and Building Engineering. The Department of Electrical Engineering offers courses for
Fig. 9: Organizational Structure of the Proposed Trinidad and Tobago Maritime Training Institute. (Modified from Shipdeco, 1985).
Electrical/ Electronic Engineering Technicians and Telecommunication Technicians. Part-time sandwich courses are also offered in these subject areas. The entry qualification for these courses requires passes at the General Certificate Ordinary Level in Mathematics, English, Chemistry and Physics.

It is envisaged that these institutions do possess the teaching personnel, facilities and equipment to provide supportive functions in engineering, radio communication and even nautical education and training.

5.11 (ii) Training in Catering.

With respect to the area of Catering, the Trinidad and Tobago Hotel School in addition to having all the facilities to provide a full and varied programme in food preparation and hotel management aspects to various levels of personnel, has demonstrated the capability of instructing seafarers in Food Preparation Control and Calculations, Bar Services, Safety and Sanitation, Dining Room Service (Theory and Practice), Menu Planning and Nutrition.

There are other agencies outside of the general education system from which resources can be drawn and utilized by the pivotal institution. These include the Caribbean Fisheries Training and Development Institute, the Training Academy of the Fire and Ambulance Services and the St. John's Ambulance Brigade.

5.11 (iii) The Caribbean Fisheries Training and Development Institute.

This organization which has a Caribbean regional basis in its foundation was discussed in Chapter III.
Section 3.3 with reference to its function in fisheries training in Trinidad and Tobago. It therefore, can have a vital role to play in the country's venture into wider maritime education and training in that it can be the ideal jumping off point. It possesses some facilities, infrastructure, equipment and personnel available for integrating into the new system. In this way it should be the genesis of the pivotal institution referred to in Section 5.10 of this chapter. However, there is need for legal and administrative agreements at the Caribbean regional and the national governmental ministerial levels to facilitate smooth integration and operation since there are yet unresolved matters related to agreements of formulation and dissolution.

The following physical facilities are currently in place:

- Classrooms: about 150 students can be accommodated in one double and one single (audio-visual) classrooms.

- Residence: residential accommodation for about 40 students.

- Library: the library which has a varied collection of books on fisheries and general maritime subjects covers about 50 square metres of floor space.

- Berthing and Waterfront Facilities: there is a jetty about 50 metres long and 3 metres wide with a working berthing depth of between 1 to 7 metres for about 90% of its length on both sides.

- Practical Workshop: the area available for practical work in nautical, engineering and fisheries covers about 2000 square metres of floor space.
- Recreation Room/Meeting Hall: this covers about 150 square metres of floor space.

- Administration Building: this building accommodates the administration section to include offices for the Principal, Accountant, Secretaries, Duplicating facilities and an additional office.

- Catering and Dining Room Facilities: these are capable of handling about 50 individuals per single sitting but staggered servings can be used.

These physical facilities plus equipments can make significant contributions to the new establishment especially when the capital investment factor is considered. Their adaptability and incorporation should be quite simple.

Among the equipment available are:

- Training Vessel: a 24 metre long steel hull converted Canadian herring seiner now a double-rigged bottom trawler capable of carrying a complement of six (6) crew and twelve (12) trainees is in use. It has a cruising range of over 500 nautical miles with an operational duration of up to two (2) weeks at sea. Equipment include radar, echo-sounders, radio direction finder, VHF radio and SSB radio all of which need updating and replacing. Complete gear equipment and machinery for bottom trawling down to about (fifty) 50 fathoms are on board.

- Teaching and Audio-Visual Aids: these include materials for seamanship and fisheries training, compasses, sextants, various models, overhead and 16mm projectors.
video playback system, nautical charts, dinghies and other miscellaneous items.

These items would be compatible with what would be needed for the expanded training programmes.

Personnel and position associated with the existing Institute include:

- Technical Staff: Principal, Training Officer, Navigation Instructor, Fishing Gear Technologist/Instructor, Master Fisherman/Instructor (Master of the Training Vessel), Vessel Crew - Mate, Engineer, Deckhand/Fishermen and Cook/Fisherman.

- Administrative Staff: Accountant and Stenographers.

- Support Staff: Storekeeper, Catering Staff, Technician, Cleaners and General Purpose Employees.

The technical staff can form the basis or even the entire staff of the Fisheries Division of the new institute where their experience and expertise can be utilized effectively. Some can be absorbed or share responsibilities in other divisions.

The other staff such as administrative, catering, secretarial, support and others in their own way can make meaningful contributions in the overall operation because of their previous knowledge and experience in a closely related field.

5:11 (iv) The Fire and Ambulance Services Department
This department which is under the Ministry of National Security is responsible for and operates the Training Academy of the Fire and Ambulance Service. It is equipped with both personnel and equipment to provide the basic training in fire prevention and fighting however this would have to be supplemented with more specific knowledge for seafarers. This can be achieved by training personnel from this organization and provide them with the necessary equipment to do the job.

5:11 (v) The St. John's Ambulance Brigade.

This organization either on its own or through the Fire and Ambulance Service is accredited to train and certify individuals in First Aid however additional training as this area relates to the seafarer must be included and as in the above a similar arrangement can be considered.

PART III: CARIBBEAN REGIONAL COOPERATION IN MARITIME EDUCATION AND TRAINING.

One of the options open to developing maritime nations and those wishing to enter the arena of maritime education and training is the utilization of other established and experienced facilities in other countries to train their nationals until such time as they are capable, if possible to satisfy their own education and training needs.

In the case of Trinidad and Tobago some limitations and constraints have already been identified in the short and medium terms which tend to support its not going the entire distance in seeking to provide education.
and training to those higher levels and specialized areas. The indication of an insufficient student throughput and the associated questionable longevity of this exercise, lack of training personnel and other factors would give support to the search for other avenues.

In Jamaica, a neighbouring Caribbean state which is a member of the same regional grouping (CARICOM) as Trinidad and Tobago and also a partner in the regional shipping company (WISCSO) arrangement plans are under way to establish the Jamaica Maritime Training Institute. It is proposed to train up to the higher levels of Master Mariner and Chief Engineer and this presents an opportunity for Trinidad and Tobago to further utilize education and training facilities in Jamaica. (Chapter IV Part II).

However, in this venture it is of prime necessity that there be discussions and agreements at the highest legal, administrative and political levels to ensure coordination and harmonization in areas such as entry qualifications, curricula, seetime, age, examination and certification criteria and procedures, mutual recognition and acceptance of certificates of competency, fees and funding and other related matters.

This approach allows Trinidad and Tobago the opportunity to concentrate on the upgrading and training of its nationals for local services with its limited resources while yet being assured that the higher levels of officer are being trained.

A regional approach to maritime education and training is a concept which seems to deserve most serious consideration by maritime administrations of the Caribbean region. It is indeed not new as evidenced by the establishment in 1974 of a regional institution for the education and training of fisheries personnel. This notion of regionalism in maritime affairs existed even much
earlier with the agreement to issue Intercolonial certificates of competency to nautical and engineering officers operating in the wider Caribbean notwithstanding the fact that this occurred during the colonial era. (Chapter 3 Section 3.3 and Appendix III).

The state and structure of today's shipping industry makes this concept even more relevant especially because of the small demand for highly qualified seafarers; the possibility of uneconomic duplication of facilities, effort, and trained manpower to serve a limited clientele in this relatively small and confined area in shipping terms.

It would seem therefore, that in support of the viewpoints of P.S. Vanchiswar (1981) and Moat and Hodge (1985) there is everything to be said for a Caribbean regional approach to maritime education and training.
PART III - GENERAL CONCLUSIONS

In this dissertation an attempt was made to examine both the theoretical and practical aspects of maritime education and training in relation to rationales, positive influences and constraints which may interact and so contribute in the overall approach to the determination of a system which is most applicable to a country - developed or underdeveloped - and its administration.

In the Trinidad and Tobago situation, as would be the case in other countries, there are other more specific factors which also feature in the establishment and successful operation of a maritime education and training system. Among some of the main parameters would be included, for example, a continuous monitoring and evaluation of the maritime industry so as to arrive at an assessment of the manpower supply and demand as the industry undergoes fluctuations; the coordination of roles and inputs of the various interest groups which operate in the industry; the prevailing and, at times, the socio-economic climates on both the national and international scenes; the active interest and timely response of the administration not only to the dynamic changes which continuously occur in the overall maritime environment but also to aspects such as updated maritime legislations and more importantly keeping pace with knowledge and information on the status of world shipping activities and the impacts which they can impose on both national and international operations.

Bearing in mind the guidelines mentioned above and the situation in Trinidad and Tobago as described in Chapters III to V in relation to the Maritime Scenario, the
Survey of the Shipping Industry and Seafarers and Some Considerations in the Application of a Manpower Study Approach to Maritime Education and Training, pragmatic considerations should be emphasized in the process of embarking on the establishment of a maritime education and training system.

Although in the longer term the Administration may find it feasible to implement education and training programmes for the highest levels of seafarers for the international trades, it would be more realistic in the short and medium terms to concentrate on the following:

(i) the setting of objectives for maritime education and training, where all the maritime industries are considered together to the extent that in such a small economy, more can be achieved through this approach than would be the case if each one is handled separately.

(ii) in the first instance the general approach to maritime education and training should be provided to meet local needs for the coastal and intercolonial/regional trades as defined in Chapter III Section 3:3.

(iii) priority should be given to the upgrading of those seafarers already in the industry to provide them with proper information and confidence to operate and perform more safely. (iv) the maritime education and training system should be integrated with the general education system.

(v) all seafarers being trained under the new system should undergo Pre-sea training of a "multipurpose" nature with adequate sea time.

(vi) the entry qualifications and early training
should be such to give the seafarer the opportunity to attain the highest level of qualification at international standards.

(vii) in the establishment of the maritime education and training infrastructure, cognizance must be taken of the various interest groups, the different maritime industries to include sea and shore based operations, the levels and types of training to be carried out and the existing institutions and personnel capable of being complementary and supportive to the system.

(viii) finally, there should be the willingness to utilize other facilities, whether regional or otherwise, to supplement the education and training which may not be offered for practical reasons in the short and medium terms.
### Appendix I: List of Acknowledged Organizations, Agencies and Associated Individuals

<table>
<thead>
<tr>
<th>Organizations/Agencies</th>
<th>Associated Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping Corporation of Trinidad and Tobago</td>
<td>Mr. C. Mends, Technical Man.; Miss D. Joseph, Man. Personnel Administration.</td>
</tr>
<tr>
<td>West Indian Shipping Corporation.</td>
<td>Mr. R. W. Chang, Secretary/Accountant.</td>
</tr>
<tr>
<td>Port Authority, Trinidad and Tobago.</td>
<td>Mr. D. H. Robinson, Mechanical Superintendent.</td>
</tr>
<tr>
<td>National Petroleum Marketing Co. Ltd.</td>
<td>Dr. Rupert Griffith, Asst. Man Manpower Planning and Dev.</td>
</tr>
<tr>
<td>Amoco Trinidad Oil Co. Ltd.</td>
<td>Mr. L. A. Darson, Vice President Exploration and Production; Mr. K. Hercules.</td>
</tr>
<tr>
<td>Trinidad and Tobago Oil Company Ltd.</td>
<td>Mr. R. F. Jones, Asst. Manager, Marine and Harbours.</td>
</tr>
<tr>
<td>Point Lisas Industrial Port Development Co. Ltd.</td>
<td>Mr. K. Snaggs, Chief Executive Officer.</td>
</tr>
<tr>
<td>Fisheries Division, Trinidad and Tobago.</td>
<td>Mr. M. La Croix, Director of Fisheries.</td>
</tr>
</tbody>
</table>
Appendix I : (Continued.)

Caribbean Fisheries Training and Development Institute.
Mrs. Z. Chin Yuen Kee, Principal.

Harbour Master’s Division Trinidad and Tobago.

Hydrographic Division, Trinidad and Tobago.
Mr. F. Charles, Hydrographer

Trinidad and Tobago Hotel School.
Mrs. C. Webbe, Director.

Harbour Master, Barbados.
Capt. H. L. Van Sluytman, Harbour Master.

Jamaica Marine Board.
Ms. L. Kitchen, Executive Asst.

Fisheries Division Barbados.
A. Durant.

Fisheries Division, Guyana.
Mr. R. Charles, Chief Fisheries Officer.

Fisheries Division St. Lucia.
Mr. N. Lawrence, Fisheries Officer.

Carcicom Secretariat
Mr. R. Gordon.
3. (1) Subject to the provisions of regulation 4 of these Regulations, a certificate of competency shall not be granted to any person unless:

(a) he has attained the age of eighteen years;

(b) Subject to the provisions of this paragraph, he has performed thirty-six months of qualifying sea service at sea in deck rating, of which not less than nine months shall have been performed in ships other than fishing boats, having a gross tonnage of 100 tons or more, or in the case of a sailing ship of 40 gross tonnage or more;

(c) he has passed an examination in the subjects specified in the syllabus set out in the First Schedule to these Regulations;

(d) he is the holder of a certificate of efficiency as lifeboatman issued by or under the authority of the Governor, or issued by the appropriate authority in any other country in accordance with conditions which are of equivalent standard to those under which certificates are issued by or under the authority of the Governor; and

(e) subject to the provisions of this paragraph, he has, otherwise than for the purpose of receiving instruction therein, take turns at the wheel in steering a ship (being a ship, other than a fishing boat, having a gross tonnage of 100 tons or more, or
in the case of a sailing ship of 40 tons gross tonnage or more) for periods amounting in an aggregate of not less than ten hours:

Provided that-

(i) when persons presenting themselves for examination for Certificate of Competency as A.B have received training at any pre-sea training course which may from time to time be approved by the United Kingdom Minister of Transport and Civil Aviation they shall receive equivalent concessions and remission of sea service to those they would have received had they taken the examination in the United Kingdom;

4. Notwithstanding that he has not complied with the conditions referred to in paragraph (1) of regulation 3 of these Regulations, a person who proves by his certificates of discharge or by a certificate of service issued by the Superintendent of the Mercantile Marine Office that he was on or before the date on which these Regulations came into operation, serving or having served during the last year as an A.B or in an equivalent or superior deck rating in a ship registered in the Territory, other than a fishing boat or a vessel trading in the Gulf of Paria, shall be entitled to the grant of a certificate of competency.

8. (1) Subject to the provisions of this paragraph, any person who has-

(a) attained the age of eighteen years; and

(b) otherwise for the purpose of receiving instruction therein, take turns at the wheel in steering a ship (being a ship, other than a fishing boat, having a gross tonnage of 100 tons or more, or in the case of a sailing ship of 40 tons or more) for periods amount-
ting in the aggregate to not less than ten hours; and
(c) performed twelve months of qualifying sea service
as a deck rating of which not less than three months
shall have been performed in ships, other than fishing
boats, having a gross tonnage of 100 tons or more, or
in the case of sailing ships of 40 tons or more shall
be entitled to make an application to be examined for
the purpose of complying with the condition referred
to in sub-paragraph (c) of paragraph (1) of regula-
tion 3 of these Regulations:

9. (1) A person shall be entitled to reckon as qualifying
sea service for the purposes of sub-paragraph (b) of
paragraph (1) of regulation 3 and (e) of paragraph (1) of
regulation 3 of these Regulation, subject to the provi-
sions thereof, all periods of service at sea as a deck
rating in ships (being ships having a gross tonnage of 15
tons or more) calculated in accordance with the pro-
visions of paragraphs (2) and (3) of this regulation.

(2) Subject to the provisions of this paragraph, eve-
ry period of service shall be calculated separately
from the date of commencement and the date of termi-
nation thereof:

Provided that where any period of service in a ship
having a gross tonnage of 100 tons or more, or, in the
case of a sailing ship of 40 tons or more is followed
immediately by a period of service in another such
ship or where any period of service in a ship of les-
sser tonnage is followed immediately by a period of
service in another such ship, the said periods shall
be treated as one continuous period, and for the pur-
pose of this proviso a period of service shall be
deemed to follow immediately upon another period of
service if the later period commences not later than
the day following the termination of the earlier period.

(3) For the purpose of calculating the total number of months of qualifying services in respect of any person—

(a) every completed calendar month comprised in a period of service in a ship having a gross tonnage of 100 tons or more, or, in the case of a sailing ship of 40 tons or more shall count as one month of qualifying service, and every day by which a period of service exceeds the number of calendar months comprised therein or where the whole period of service is less than a calendar month every day of service shall count as one-thirtieth of a month of qualifying service; and

(b) every completed calendar month comprised in a period of service in a ship having a gross tonnage of less than 100 tons or in the case of a sailing ship, of less than 40 tons, shall count as one-half of a month of qualifying sea service, and every day by which a period of service exceeds the number of calendar months comprised therein or where the whole period of service is less than a calendar month every day of service shall count as one-sixtieth of a month of qualifying service.

First Schedule

SYLLABUS FOR EXAMINATION FOR RATING OF ABLE SEAMEN

Nautical Knowledge:

(1) The meaning of common nautical terms.

(2) The names and functions of various parts of the
ship (e.g. decks, compartments, ballast tanks, strumboxes etc)

(3) Knowledge of the compass and ability to report the approximate bearing of an object in terms of points on the bow.

(4) Understanding Helm Orders.

(5) Reading, streaming and hauling in a patent log.

(6) Markings on a hand line, taking a cast of the hand line and correctly reporting the soundings obtained.

(7) The patent sounding machine; how to rig it and take a cast.

(8) Ship cleanliness and personal hygiene.

Practical Work:

(To be tested as far as possible by practical demonstrations).

(9) Knots in common use. Hitches, bends, etc, in common use. Whipping a rope’s end. Finishing off a heaving line by a wall and crown knot or other simple method. Putting a stopper on a hawser or derrick lift. Putting on a seizing.


(Demonstration of the cut splice will not be required).

(11) Reeving a boat’s fall or luff tackle.

(12) Slinging a stage and rigging a boatswain’s chair.

(13) How to steer.

(14) Rigging a derrick. Driving a winch, engaging and disengaging gears and their use. General precautions to be taken before and during operation of a winch whether used for working cargo or for warping.
The use and operation of a windlass in anchor work and in warping. Stowage of chain cable in the chain locker and securing the anchor for sea.

A knowledge of the gear used in cargo work and an understanding of its uses. General maintenance with special reference to the overhauling of gin blocks and guy blocks.

The safe handling of hatch covers; battening down and securing a hatch.

Use, care and maintenance of life saving appliances.

Boat Work:

A candidate will be required to satisfy the examiner that:-

(a) he understands and can carry out orders relating to life boat launching and operation and the management of a boat under sail;
(b) he understands the general principles of boat management in a tideway and in bad weather; and in landing on all kinds of beaches or in a surf; and
(c) he is familiar with a life boat and its equipment and the starting and running of the engines of a powered boat.
APPENDIX III: Examination and Certification of Launch Captains and Launch Engineers—Trinidad & Tobago.


2: "motor launch" means any steam launch, motor boat or other vessel propelled by mechanical power, not exceeding thirty and one half metres in length.

SUBSIDIARY LEGISLATION

MOTOR LAUNCHES REGULATIONS.

11.(1) Examinations of captains and engineers of launches for Certificates of Competency will be held at the Harbour Master's Office at such time as may be arranged with the Harbour Master.

12. Captains of launches will be required to satisfy the examiners that—
   (a) their eyesight is normal as regards form and colour vision;
   (b) by demonstrating with models that they have a working knowledge of the Regulations for preventing Collisions at Sea;
   (c) that they have a thorough knowledge of the different lights carried at night by all types of small craft;
   (d) they understand the effect of the propeller and rudder on a launch when going ahead and...
astern, and understand how to go alongside piers, jetties, gangways and ladders;
(e) they understand how to secure their boat alongside vessels and piers, and to pick up mooring buoys;
(f) they have a thorough knowledge of the regulations relating to harbours and Port Services;
(g) they know what action to take in case of fire, man overboard, taking a boat in tow, being taken in tow, losing a rudder, engine breaking down, etc., under conditions per-supposed by their examiners.

13. An engineer of a launch with internal combustion engines will be required to satisfy the examiners that he—
(a) understands the construction of his engine, including wiring, order of cylinder-firing, timing, the lubrication and water cooling systems, adjusting the carburettor, and how to remove cylinders;
(b) knows how to clean his engine, including decarbonising the engine, adjusting piston rings and adjusting bearings;
(c) knows how to locate faults in the event of breakdown;
(d) knows what action to take in emergency such as fire, etc.

14. Engineers of launches with steam engines will be required to satisfy the examiners that they understand—
(a) the construction of the boiler, boiler mounting and steam pipes, including how to see that water is maintained at the correct level, and what action to
take in emergency;
(b) the construction and action of the safety valve, and casing gear;
(c) how to fire the boiler and maintain steam under all conditions;
(d) construction and principle of main engines, auxiliary machinery and shafting with all pipe connections;
(e) how to locate faults and do minor adjustments and repairs;
(f) what action to take in emergency such as fire, etc.
APPENDIX IV: Intercolonial Certificates of Competency.

Source: Extracts from "Chapter 18 No. 5 Part VI of the Trinidad and Tobago Revised Ordinance 1950.

PART VI

INTERCOLONIAL CERTIFICATES OF COMPETENCY.

88. In this Part of Ordinance—
"intercolonial ship" includes a ship employed in trading or going between the Island of Trinidad and the Island of Tobago, or between some place or places in the Colony and some place or places between the equator and latitude 28 degrees North and east of longitude 90 degrees West and west of longitude 50 degrees West, but does not include a coastal ship or a ship employed in trading within the Waters of the Gulf of Paria;
"master" includes every person (except a pilot) having command or charge of any ship.

89. The Governor may, on the recommendation of the duly appointed Board of Examiners, grant certificates of competency for an intercolonial ship as master, mate or engineer, in accordance with this Ordinance.

90. (1) Examinations for intercolonial masters, mates and engineers shall be held at such times and places as the Governor may from time to time by notice in the Royal Gazette appoint. (2) The Governor in Council may make rules, which shall be strictly adhered to by the examiners for:
(a) the qualifications of examiners and the remuneration to be made to them,
(b) the qualification of the candidates,
(c) the conduct of the examinations.
40. 5: (1) Every candidate for examination for a Master's Certificate of Competency shall not be less than 23 years of age.

(2) Every candidate for examination for a Mate's Certificate of Competency shall be not less than 20 years of age.

6: (1) No candidate for a certificate of competency either as a master or mate shall be granted such certificate unless he passes such eyesight test (including a test of ability to distinguish colours) as may be required by the Board.

8: (1) Subject to paragraph (2) of this regulation a candidate for a master's certificate of competency shall satisfy the Board that he is the holder of a mate's certificate of competency.

(2) A candidate who is able to satisfy the Board that for a period of not less than two years (although not the holder of a master's certificate of competency) has been acting as a master of a steamship may be permitted to take the examination for a master's certificate of competency.
9. (1) Every candidate for examination for a master’s certificate of competency shall produce a valid first aid certificate.
   (2) For the purpose of this regulation a first aid certificate shall cease to be valid three years from the date of issue.

10. Every candidate for examination for a mate’s certificate of competency for a home ship shall have served at least four years at sea on deck of a foreign ship or on a home trade ship. Any such candidate who desires a sailing ship endorsement on his certificate shall satisfy the Board that at least two years of the said period have been spent on a foreign going or on a home trade sailing ship.

11. Every candidate for examination for a master’s certificate of competency for a home trade ship shall have served at least five years at sea on deck either on a foreign ship or on a home trade ship at least twelve months of the period of five years shall have been spent as a mate whilst holding a mate’s certificate of competency for the home trade. Any such candidate who desires a sailing ship endorsement on his certificate shall satisfy the Board that at least three years of the said period have been spent on a foreign going or a home trade sailing ship and that during at least twelve months of such period of three years he was serving as mate whilst holding a mate’s certificate of competency for the home trade with a sailing endorsement.
Schedule
Appendix A (Regulation 18)

14. The examinations shall be on the following basis:

<table>
<thead>
<tr>
<th>Mate (Home Trade)</th>
<th>Time</th>
<th>% Pass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation</td>
<td>3 Hours</td>
<td>70%</td>
</tr>
<tr>
<td>Chartwork</td>
<td>2 Hours</td>
<td>70%</td>
</tr>
<tr>
<td>General Ship knowledge</td>
<td>2 Hours</td>
<td>50%</td>
</tr>
<tr>
<td>Signals</td>
<td>-</td>
<td>80%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Master (Home Trade)</th>
<th>Time</th>
<th>% Pass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation</td>
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</tr>
<tr>
<td>Chartwork</td>
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</tr>
<tr>
<td>General Ship Knowledge</td>
<td>2 Hours</td>
<td>50%</td>
</tr>
<tr>
<td>Signals</td>
<td>-</td>
<td>80%</td>
</tr>
<tr>
<td>Essay</td>
<td>1 Hour</td>
<td>50%</td>
</tr>
</tbody>
</table>

An average of 70% for the examination.
22. Examinations shall be on the lines set out in Appendix B hereto.

APPENDIX B - SYLLABUS.

Examination for Master’s and Mate’s Certificate.

Home Trade Chart Examination

(1) To lay off courses and distances on a chart.
(2) To be able to correct courses and bearings for compass error, deviation and variation.
(3) To understand the use of deviation card.
(4) To lay off cross bearings on a chart.
(5) To be able to lay off and find the ship’s position, given two bearings of an object with a run between.
(6) To be able to find the ship’s position given the rising or dipping bearing of a light the height of which is known. Also to find the distance of an object by vertical angles.
(7) To be able to find the set and drift of a current from data supplied and to correct a vessel’s course for the set and drift determined or given.
(8) To understand the chart abbreviations, and the characteristics of lights, buoys and beacons.
(9) To understand the purpose and use of notice to Mariners.

Note: A higher standard is required of masters than is required of mates.
Navigation Examination

(1) To convert points, quarter points, etc., of a compass into degrees.
(2) To define and have a thorough understanding of compass error, deviation and variation.
(3) To be able to navigate by dead reckoning.
(4) To understand the adjustment of a sextant and its use.
(5) To be able to find and apply the daily rate of a chronometer.
(6) To find error and deviation of a compass by Azimuth Tables.
(7) To find a vessel's position by observations of the sun for both latitude and longitude.
(8) To be able to use Tide Tables, Light List, and Sailing Directions.
APPENDIX VI: Interpretation of Abbreviations in Table XVII.

IMO. - International Maritime Organization.
SOLAS. - International Convention on the Safety of Life at Sea.
STCW. - International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.
MARPOL. - International Convention for the Prevention of Pollution from Ships.
INTER. - International Convention Relating to the Intervention on the High Seas in Cases of Oil Pollution Casualties.
CLC. - International Convention on Civil Liabilities for Oil Pollution Damages.
TONN. - International Convention on Tonnage Measurement.
CSC. - International Convention on Safe Containers.
PAL. - Athens Convention Relating to the Carriage of Passengers and their Luggage by Sea.
LLMC. - Convention on Limitation of Liability for Maritime Claims.
CHAPTER II

MASTER－DECK DEPARTMENT

Regulation II/1

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

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

2. The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational watch. Under the master's general direction, the officers of the watch are responsible for navigating the ship safely during their periods of duty when they will be particularly concerned with avoiding collision and stranding.

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

4. **Watch arrangements**

(a) The composition of the watch shall at all times be adequate and appropriate to the prevailing circumstances and conditions and shall take into account the need for maintaining a proper look-out.

(b) When deciding the composition of the watch on the bridge which may include appropriate deck ratings, the following factors, *inter alia*, shall be taken into account:

   (i) at no time shall the bridge be left unattended;
   
   (ii) weather conditions, visibility and whether there is daylight or darkness;
   
   (iii) proximity of navigational hazards which may make it necessary for the officer in charge of the watch to carry out additional navigational duties;
   
   (iv) use and operational condition of navigational aids such as radar or electronic position-indicating devices and any other equipment affecting the safe navigation of the ship;
   
   (v) whether the ship is fitted with automatic steering;
   
   (vi) any unusual demands on the navigational watch that may arise as a result of special operational circumstances.
5 Fitness for duty

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

6 Navigation

(a) The intended voyage shall be planned in advance taking into consideration all pertinent information and any course laid down shall be checked before the voyage commences.

(b) During the watch the course steered, position and speed shall be checked at sufficiently frequent intervals, using any available navigational aids necessary, to ensure that the ship follows the planned course.

(c) The officer of the watch shall have full knowledge of the location and operation of all safety and navigational equipment on board the ship and shall be aware and take account of the operating limitations of such equipment.

(d) The officer in charge of a navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship.

7 Navigational equipment

(a) The officer of the watch shall make the most effective use of all navigational equipment at his disposal.

(b) When using radar, the officer of the watch shall bear in mind the necessity to comply at all times with the provisions on the use of radar contained in the applicable regulations for preventing collisions at sea.

(c) In cases of need the officer of the watch shall not hesitate to use the helm, engines and sound signalling apparatus.

8 Navigational duties and responsibilities

(a) The officer in charge of the watch shall:

(i) keep his watch on the bridge which he shall in no circumstances leave until properly relieved;

(ii) continue to be responsible for the safe navigation of the ship, despite the presence of the master on the bridge, until the master informs him specifically that he has assumed that responsibility and this is mutually understood;

(iii) notify the master when in any doubt as to what action to take in the interest of safety;

(iv) not hand over the watch to the relieving officer if he has reason to believe that the latter is obviously not capable of carrying out his duties effectively, in which case he shall notify the master accordingly.

(b) On taking over the watch the relieving officer shall satisfy himself as to the ship's estimated or true position and confirm its intended track, course and speed and shall note any dangers to navigation expected to be encountered during his watch.
9. Look-out

In addition to maintaining a proper look-out for the purpose of fully appraising the situation and the risk of collision, stranding and other dangers to navigation, the duties of the look-out shall include the detection of ships or aircraft in distress, shipwrecked persons, wrecks and debris. In maintaining a look-out the following shall be observed:

(a) the look-out must be able to give full attention to the keeping of a proper look-out and no other duties shall be undertaken or assigned which could interfere with that task;

(b) the duties of the look-out and helmsman are separate and the helmsman shall not be considered to be the look-out while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper look-out. The officer in charge of the watch may be the sole look-out in daylight provided that on each such occasion:

(i) the situation has been carefully assessed and it has been established without doubt that it is safe to do so;

(ii) full account has been taken of all relevant factors including, but not limited to:

- state of weather
- visibility
- traffic density
- proximity of danger to navigation
- the attention necessary when navigating in or near traffic separation schemes;

(iii) assistance is immediately available to be summoned to the bridge when any change in the situation so requires.

10. Navigation with pilot embarked

Despite the duties and obligations of a pilot, his presence on board does not relieve the master or officer in charge of the watch from their duties and obligations for the safety of the ship. The master and the pilot shall exchange information regarding navigation procedures, local conditions and the ship’s characteristics. The master and officer of the watch shall co-operate closely with the pilot and maintain an accurate check of the ship’s position and movement.

11. Protection of the marine environment

The master and officer in charge of the watch 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 11/2

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;

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(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\(^1\), 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.

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\( ^1 \)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**, 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.

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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**


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 11/3

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 11/1 - "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 unreasonable 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 11/3

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.

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**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.
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:
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*, 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.

*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 26 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.


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.

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 engineer
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 CO₂ 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 3000 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 3000 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 3000 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 3000 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 3000 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 3000 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
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 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 sub-paragraph (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
3000 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.
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.
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 if 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.
CHAPTER V
SPECIAL REQUIREMENTS FOR TANKERS

Regulation V/1

Mandatory Minimum Requirements for the Training and Qualifications of Masters, Officers and Ratings of Oil Tankers

1. Officers and ratings who are to have specific duties, and responsibilities related to those duties, in connexion with cargo and cargo equipment on oil tankers and who have not served on board an oil tanker as part of the regular complement, before carrying out such duties shall have completed an appropriate shore-based fire-fighting course; and

(a) an appropriate period of supervised shipboard service in order to acquire adequate knowledge of safe operational practices; or

(b) an approved oil tanker familiarization course which includes basic safety and pollution prevention precautions and procedures, layouts of different types of oil tankers, types of cargo, their hazards and their handling equipment, general operational sequence and oil tanker terminology.

2. Masters, chief engineer officers, chief mates, second engineer officers and, if other than the foregoing, any person with the immediate responsibility for loading, discharging and care in transit or handling of cargo, in addition to the provisions of paragraph 1, shall have:

(a) relevant experience appropriate to their duties on oil tankers; and

(b) completed a specialized training programme appropriate to their duties, including oil tanker safety, fire safety measures and systems, pollution prevention and control, operational practice and obligations under applicable laws and regulations.

3. Within two years after the entry into force of the Convention for a Party, a seafarer may be considered to have met the requirements of paragraph 2(b) if he has served in a relevant capacity on board oil tankers for a period of not less than one year within the preceding five years.

Regulation V/2

Mandatory Minimum Requirements for the Training and Qualifications of Masters, Officers and Ratings of Chemical Tankers

1. Officers and ratings who are to have specific duties, and responsibilities related to those duties, in connexion with cargo and cargo equipment on chemical tankers and who have not served on board a chemical tanker as part of the regular complement, before carrying out such duties shall have completed an appropriate shore-based fire-fighting course; and
(a) an appropriate period of supervised shipboard service in order to acquire adequate knowledge of safe operational practices; or

(b) an approved chemical tanker familiarization course which includes basic safety and pollution prevention precautions and procedures, layouts of different types of chemical tankers, types of cargo, their hazards and their handling equipment, general operational sequence and chemical tanker terminology.

2. Masters, chief engineer officers, chief mates, second engineer officers and, if other than the foregoing, any person with the immediate responsibility for loading, discharging and care in transit or handling of cargo, in addition to the provisions of paragraph 1, shall have:

(a) relevant experience appropriate to their duties on chemical tankers; and

(b) completed a specialized training programme appropriate to their duties including chemical tanker safety, fire safety measures and systems, pollution prevention and control, operational practice and obligations under applicable laws and regulations.

3. Within two years after the entry into force of the Convention for a Party, a seafarer may be considered to have met the requirements of paragraph 2(b) if he has served in a relevant capacity on board chemical tankers for a period of not less than one year within the preceding five years.

Regulation V/3

Mandatory Minimum Requirements for the Training and Qualifications of Masters, Officers and Ratings of Liquefied Gas Tankers

1. Officers and ratings who are to have specific duties, and responsibilities related to those duties, in connexion with cargo and cargo equipment on liquefied gas tankers and who have not served on board a liquefied gas tanker as part of the regular complement, before carrying out such duties shall have completed an appropriate shore-based fire-fighting course; and

(a) an appropriate period of supervised shipboard service in order to acquire adequate knowledge of safe operational practices; or

(b) an approved liquefied gas tanker familiarization course which includes basic safety and pollution prevention precautions and procedures, layouts of different types of liquefied gas tankers, types of cargo, their hazards and their handling equipment, general operational sequence and liquefied gas tanker terminology.

2. Masters, chief engineer officers, chief mates, second engineer officers and, if other than the foregoing, any person with the immediate responsibility for loading, discharging and care in transit or handling of cargo, in addition to the provisions of paragraph 1, shall have:

(a) relevant experience appropriate to their duties on liquefied gas tankers; and
(b) completed a specialized training programme appropriate to their duties including liquefied gas tanker safety, fire safety measures and systems, pollution prevention and control, operational practice and obligations under applicable laws and regulations.

3. Within two years after the entry into force of the Convention for a Party, a seafarer may be considered to have met the requirements of paragraph 2(b) if he has served in a relevant capacity on board liquefied gas tankers for a period of not less than one year within the preceding five years.
APPENDIX VIII: Interpretation to Abbreviations in Figure 9.

Minister of Works,
Settl. & Infr.— Minister of Works, Settlement and Infrastructure.
Min. W.S. & I— Ministry of Works, Settlement and Infrastructure.
Min. F.P.M.E.— Ministry of Food Production, Marine Exploitation, Forestry and the Environment.
Min. Educ.— Ministry of Education.
Hd. Inst.— Head of Institute.
Seaf. Union.— Seafarers Union.
Ship. Inst.— Shipping Interests.
Min. F & P.— Ministry for Finance and Planning.
Hd. Naut.— Head of Nautical Department.
Hd. Eng.— Head of Engineering Department.
Hd. Admin.— Head of Administration.
Port, Sem, Work.— Port, Seminars and Workshops Department.
Hd. Fish.— Head of Fisheries Department.
Lect.— Lecturers.
Instr.— Instructors.
Tech.— Technicians.
Acct.— Accounts.
Sec.— Secretaries.
Othrs.— Others.


   Minimum Standards in Merchant Ships and Appendices.

8. International Conference on Training and Certifica-
   tion of Seafarers 1978. Final Act on the Conference
   with attachments including the International Con-
   vention on Standards of Training, Certification and
   Watchkeeping for Seafarers 1978. International
   Maritime Organization.

9. Laws of Trinidad and Tobago:

   (1) Caribbean Fisheries Training and Development
       Institute Act 15 of 1975.

   (ii) Merchant Shipping Act 1894.

   (iii) Merchant Shipping Act- Revised Ordinances 1950:
       Chapter 18 No. 5 Part VI.

   (iv) Merchant Shipping Act - Revised Ordinance 1960:
       The Motor Launches Act 21 of 1926.

   (v) Merchant Shipping ( Certificate of Competency
       as (AB) (Trinidad and Tobago) Regulations 1960.

   (vi) Port Authority Act 39 of 1961.


10. Major Issues in World Shipping (A) Merchant Fleet
    Development-Structure of World Shipping. Report by


