Organizational requirements for the development of the maritime education and training

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Organizational Requirements for the Further Development of the Maritime Education and Training in Mexico

by
Wilfrido Chipuli Palma
México

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

MASTER OF SCIENCE DEGREE
in
MARITIME EDUCATION AND TRAINING
(Nautical)

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

Signature

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To my parents:

ROGELIA PALMA DE CHIPULI

and

DOMINGO CHIPULI ILLAN

( 1928 - 1986 )

WILFRIDO CHIPULI PALMA
Within the context of a national economic development policy it is necessary to consider the establishment of programs which will increase the participation of the country in international maritime trade.

Nowadays the shipping industry is undergoing a series of changes which involve different factors; economic, sociological, political, technical, and educational, among others. Consequently, one of the attendant areas to deal with in the development of global maritime policies on a national basis is the one concerned with maritime education.

This study firstly analyses the present situation of the organizational system of maritime education in Mexico and examines its historical, sociological and strategical significance (Chapter 2).

The aim of all organizations may be described as the fulfillment of prescribed tasks through the most effective use of available resources. Since people are the main resource in educational institutions, Chapter 3 focuses on the study of the human resources, namely the management of personnel working in maritime colleges.

The study then explores, in Chapter 4, the main elements of
the training and development function and its relationship to the overall functioning of the organizational system of maritime education in Mexico.

Chapter 5 cuts through the complexity of strategic planning and describes the process by laying bare clear systematic guidelines which should be utilized within the system of maritime education in Mexico.

In recognition of the need to improve maritime educational and training programs, Chapter 6 analyses the seafarer's career and its relationships to marine casualties in order to evaluate maritime education in Mexico.

Finally, Chapter 7 reiterates and emphasizes the ideas and recommendations contained in the aforementioned chapters in order to implement the ORGANIZATIONAL REQUIREMENTS FOR THE FURTHER DEVELOPMENT OF THE MARITIME EDUCATION AND TRAINING IN MEXICO.
ACKNOWLEDGMENTS

At different stages of development in the elaboration of this paper, there were several persons whose support helped me to bring this work to completion.

My profound thanks to:

Mr. Carlos M. Bandala Fraga, the General Director of Merchant Marine, and Mr. Rubén Moya Basañez, the Secretary-General of the Trusteeship, in charge of the maritime colleges in Mexico whose efforts and interest made possible my participation at the WMU.

Mr. Piet Van Den Driest, Director of the Dutch Maritime Teachers Training Institute "Ver Cornelis Douwes" in Amsterdam and Chairman of the International Maritime Lecturers Association "IMLA" from 1984 to 1986, who kindly gave me his constructive comments on the various chapters of this paper.

Mr. Günther Zade, Vice Rector of the World Maritime University, for providing me with stimulating and helpful criticism throughout the development of this paper.

I am also very grateful to:

Miss Alison Howe, Lecturer of the English Language Programme
in this University, for her invaluable assistance in the editing of this thesis.

Mr. Richard Poisson and Miss Mitzi Kjellqvist, respectively Librarian and Assistant Librarian of this University, for helping me to select and obtain a number of the reference books utilized to complete this paper.

My wife, Lilian, for her constant support and encouragement, for her patient efforts in typing drafts and the final manuscripts, and for having made this paper presentable.
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Seafaring is not simply another job, it is another way of life.

1.1 STATEMENT OF OBJECTIVES

The aim of this paper is to identify and define the basic terms of reference which are necessary to improve maritime education in Mexico. In this context, four attendant areas will be dealt with, namely:

1) human resource management,
2) training and development,
3) strategic educational planning, and
4) maritime educational evaluation.

Furthermore, when these concepts are structured and geared into this unique educational environment, they will help to:

a) restructure the organizational system of maritime education in Mexico,
b) formulate and implement a more flexible and versatile undergraduate scheme, and

c) contemplate the relationship between the maritime administration, the shipping companies and the maritime educational system so that the process of integration of the new officer aboard will be the most suitable.

1.2 SCOPE AND ORGANIZATION

As was stated earlier, this research forms a necessary part towards the proper development of the maritime educational system in Mexico.

To complete the research, it was essential to bring together a set of conceptual frameworks, which include:

1) Human resources, which can be compared metaphorically to the fuel or source of energy,

2) Staff development or the engine necessary to transform this energy into work,

3) Strategic planning, which means the cargo stowage plan and passage planning, and

4) Evaluation concepts, which can be compared to the safe navigation of our vessel the "Maritime Colleges" through the maritime environment (i.e. society, maritime administration and shipping companies).

In this way the students, or our precious cargoes, are taken from the departure port (HIGH SCHOOL) to their final port of destination (MARITIME INDUSTRY).

Figure 1.1 is used in this context to show the conceptual framework in which this paper is organized and accordingly its scope.
FIG. 1.1 CONCEPTUAL FRAMEWORK OF MARITIME EDUCATION.
1.3 LIMITATIONS OF THE STUDY

Due to time constraints and to the necessity of describing the fundamental concepts stated in section 1.2, it was not possible to continue the research into a deeper study of the subject. Almost all of the ideas were related to the Mexican system of maritime education. Even so, some of them could be used in other systems or institutions.

The library research undertaken at the WMU was limited due to the size and the stage of development of the Library, in spite of the commitment of its personnel. The matters related to curriculum were focused on the deck department. Finally, the author has followed the convention of using the masculine gender to avoid repeating that his comments apply to both men and women.

1.4 AREAS FOR FURTHER RESEARCH

Chapters three to five can lead to further research, which can only be carried out within the environment of the Secretariat of Communications and Transport (i.e. Secretaria de Comunicaciones y Transportes or S.C.T.) in Mexico. The advance educational maritime center, suggested in Chapter 4, is only one of the ideas which requires the development of management approaches such as the ones described in the aforementioned chapters.

One the other hand, the matters related to systematic resettlement of seafarers, suggested in Chapter 6, require the active participation of all the parties involved in the
maritime industry, specially the maritime administration and the shipping companies.

1.5 METHODOLOGY

The fundamental tool used in completing this paper was library research. Even so, many of the ideas utilized in this paper are the result of two years spent in the nurturing atmosphere of the World Maritime University. The basic concepts which were transmitted by the lecturers were used as guidelines in the process of developing the author's ideas.

Written material obtained in the form of hand-outs at the lectures in the WMU and during field trips completed the list of implements which were necessary to finish the paper. All these tools and ideas would have been useless without the help of the critical path method in scheduling the different necessary steps for bringing this work to completion.

Finally, it is worth mentioning that this paper is research aware but not research burdened.
CHAPTER 2

OUTLINE OF THE EXISTING ORGANIZATIONAL FRAMEWORK

When you can not understand a problem, go back to the basics and you will start finding some answers....

2.1 INTRODUCTION

The maritime educational system in Mexico finds its roots in 1880, when a Presidential Decree gave the pertinent orders to establish two maritime academies and that started regular activities a year later, in 1881. For more than 100 years this unique maritime educational environment has undergone several stages of development, some of the most relevant are:

a) In 1917, it was established in article 32 of the Mexican Political Constitution that all vessels under Mexican flag had to be manned 100% by Mexican citizens by birth.
b) In 1956, a Presidential Decree gave the authorization to award a Bachelor of Sciences degree for graduates from the merchant marine academies. At the same time the Secretary of the Navy instructed the three maritime
academies to implement the curriculum, excluding the military subjects, which was then being utilized in the naval academy.

c) In 1971, a Trusteeship (i.e. Fideicomiso) was established in order to restructure and administer all the matters related to maritime education; it commenced activities one year later.

d) In 1976, the General Directorate of the Merchant Marine (i.e. Dirección General de Marina Mercante) and the Trusteeship including the three maritime colleges, were reassigned from the Secretariat of the Navy to the Secretariat of Communications and Transport (i.e. S.C.T.).

The years that have passed since that uncertain beginning have served to develop a system worth mentioning. Furthermore, as in any other organization, it will be necessary to describe each one of its parts in order to see and understand the problems that it is facing and the ones that it will be necessary to tackle so that an evaluation can be made.

2.2 THE TRUSTEESHIP

The Trusteeship, as stated in section 2.1, was created with the purpose of restructuring, organizing and administering all the matters in connection with maritime education. Since its establishment in 1971, it has undergone two main stages, which are related to its objectives:

a) First, it was named "Trusteeship for the Restructuring and Administration of the Maritime Colleges" (i.e. Fideicomiso para la Restructuración y el Funcionamiento de las Escuelas Náuticas Mercantes) to indicate its origi-
nal aims. At that moment the Trusteeship was dealing solely with the formation of deck and engine department officers; and the three maritime colleges were the only available establishments.

b) Second, with the adoption of the STCW-78 Convention, it was essential for Mexico to formulate a strategy in order to comply with the requirements established in that convention, before it entered into force. This plan was carried out in 1979, and the following were added to the existing infrastructure: Planetarium, Radar and Engine room simulators in each college; a fully equipped general cargo Training Ship; and the training facilities at Lázaro Cárdenas port.

With these changes, it was essential to adapt the name of the Trusteeship to its new functions, so the name was modified in 1983 to "Trusteeship for the Formation and Upgrading of Personnel for the National Merchant Marine" ( i.e. Fideicomiso para la Formación y Capacitación del Personal de la Marina Mercante Nacional ).

In order to perform and obtain its goals and objectives, the Trusteeship is integrated by:

1) Technical Committee ( i.e. Comité Técnico ), which consists of Representatives of the Federal Government, the Shipping Companies and Officers' Association.

2) Presidency ( i.e. Presidencia ), which is devolved upon the General Director of the Merchant Marine, and

3) Director of the Trusteeship ( i.e. Director del Fideicomiso ), who is directly responsible for the performance of the programs established by the Technical Committee.

Furthermore, the Trusteeship, as shown in Figure 2.1, is divided into five branches which provide maritime education and training in the following fields:
FIG. 2.1 ORGANIZATIONAL CHART OF THE TRUSTEESHIP.
   Upgrading courses.
b) Training ship: Formation of new officers.
   Training of ratings.
   Training of port operators.

2.3 MARITIME COLLEGES

There are three maritime colleges in Mexico; one of them is located on the west coast (Pacific Ocean), and the other two are on the east coast (Gulf of Mexico):

b) Maritime college in Tampico, founded in 1945.
c) Maritime college in Veracruz "Fernando Siliceo y Torres", founded in 1918.

The responsibilities of each college regarding maritime education can be summarized as follows:

1) To impart the first four semesters of education in the formation of new officers, deck and engine room departments (The complete period of professional studies is six semesters).
2) To impart upgrading courses for graduated officers.
3) Assessment and Certification of Officers in the upper levels.
4) Elaboration and improvement of the syllabus for the first four semesters. Adjustments are made on a yearly basis.
5) Elaboration and improvement of the syllabus for the upgrading courses.

Fig. 2.2 shows the basic organizational chart of the college.
2.4 THE TRAINING SHIP "NÁUTICAS MÉXICO"

"NÁUTICAS MÉXICO" is a new, specially designed and fully equipped combined general cargo/training ship with facilities to accommodate 200 students and which is operated on a commercial basis. Its main particulars are the following:

- L.B.P. 150.5 mts.
- M.B. 21.0 mts.
- Draught 9.2 mts.
- Speed 18.0 Knots
- D.W. 12000.0 metric tons
- Capacity 15000.0 cu.mts.

The main responsibility of the training ship concerning
maritime education, is to impart the last two semesters of education and training in the formation of new officers for the merchant marine.

In order to obtain the required results as regards education, the ship is equipped with the following aids:

- Simulated bridge.
- Radar simulator including ARPA system (making a total of 11 radars for training).
- Navigational aids simulator (including LORAN C, DECCA, OMEGA, SATELLITE, RDF).
- Stability simulator (stability calculations, stress calculations, cargo movements).
- Diesel simulator.
- U.M.S. simulator.
- Radio-room simulator.
- Laboratories: English, Seamanship, Electronics, Electricity, Physics, Chemistry, Refrigeration, Mechanics.
- 6 Classrooms, equipped with different audiovisual aids: overhead projectors, slide projectors and closed circuit video projectors, with a capacity of 20 students each.
- Library (containing among other books, all IMO publications).
- Others: sextants, azimuth mirrors, etc.
- The ship itself.

To ensure the proper performance of this floating educational asset, it was necessary to provide the vessel with 73 persons, 18 of them as instructors.

The personnel on board is divided into: Directive, Operative and Academic (as shown in Fig. 2.3), the Captain being the ultimate authority on board.

To date the ship has sailed more than 215,000 n.m. and has
FIG. 2.3 ORGANIZATIONAL CHART OF THE TRAINING SHIP.
carried more than 170,000 tons of cargo (containers, bulk and dry cargo) to more than 25 countries.

2.5 TRAINING CENTER IN LÁZARO CÁRDENAS

This center, which started activities in 1984, is located on the west coast of Mexico (Pacific Ocean) at the industrial port of Lázaro Cárdenas.

Its basic responsibilities concerning maritime education and training are the following:

a) FORMATION OF NEW RADIO-OFFICERS:
   The course of instruction which has been prepared is covered in two years. During this period the students have procedural instruction at the local Coast Radio Station and a two-month trip aboard "Náuticas México". The standard of the training course conforms with the requirements of the ITU and the STCW-78.

b) TRAINING OF MERCHANT MARINE RATINGS:
   This course varies in content and duration according to the level of seafaring experience and future position to be occupied on board. The courses imparted are based on the requirements of the STCW'78 convention.

c) PORT AND DOCK WORKER TRAINING:
   These courses are also different in content and duration, encompassing a range of activities, which provide the port worker with an increased awareness of safety at work, and enhance the skills related to cargo handling and port equipment maintenance as well.

In order to establish and implement these courses, it was necessary to apply for technical assistance to UNCTAD (in establishing port and dock workers training), and to IMO.

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2.6 ANALYSIS OF THE MARITIME EDUCATION SYSTEM'S STRUCTURE

In order to discover in what ways the maritime educational system in Mexico structures its activities, it is essential to identify those parameters which can precisely formulate the characteristics of its organization. To do such an analysis, it is necessary to revert to variables that can be clearly defined and measured. Among the dimensions of organizational structure, it has been selected the following:

- SPECIALIZATION:
  1. According to earlier sections, it is obvious that the functions performed by the maritime colleges in Mexico are those related to the highest degree of specialization in shipping.
  2. The following are some of the courses which are offered, apart from those dedicated to the formation of new officers:
     - Diesel and U.M.S. simulator.
     - Radio-telephony.
     - Masters.
     - Chief engineer.
     - Port captain.
     - Controlling costs in shipping companies.
     - Surveyors.
     - Maritime English.

- STANDARDIZATION:
  1. Since the establishment of the Trusteeship, all three colleges have cooperated in developing curriculum standards so that the syllabi for formation courses
are the same at each institution.

2.- The same applies for upgrading courses' syllabi.
3.- The aims to standardize the courses as per the requirements set by I.M.O. will lead to further standardization of the syllabi in the system.

- EMPLOYMENT PRACTICES:
1.- Authorization to recruit personnel at each college is established by the Trusteeship.
2.- The lack of available human resources to fill the most specialized posts and the salaries that are being offered make it difficult to follow any procedure when recruiting.

- FORMALIZATION:
1.- The Trusteeship is divided into a hierarchy of horizontal strata, so that the organigram takes the form of a pyramid.
2.- An important linking function in this management structure is performed by the Principals of the colleges and the Training Ship.
3.- Meetings are carried out at different levels on a regular basis with their respective agendas and minutes.
4.- As in any other organization, there are sources of informal communication.
5.- There is an outline of job descriptions as a written term of reference for duties and responsibilities at work.

- CENTRALIZATION:
1.- Because of the nature of the maritime educational system in Mexico, all the administrative and financial power is delegated to the Director of the Trusteeship.
by the Secretary of Communications and Transport, according to the Federal Laws of the country, via the General Directorate of the Merchant Marine.

2.- The Director of the Trusteeship in Mexico City is given advise by the Technical Committee, which is the body in charge of setting policy guidelines and planning programs.

- CONFIGURATION:

1.- The management chain of command is relatively short: five levels from the Director of the Trusteeship to the lecturers.

2.- The linking points of function at different levels have a relatively small number of subordinates.

3.- The lecturers' level, which constitutes specialized support personnel, represents a large percentage of the organization.

2.7 EVALUATING THE EXISTING ORGANIZATIONAL FRAMEWORK

Although the concept "EVALUATION" is usually used to imply a value judgement, most of the time, this connotation constricts its meaning. Instead, it is better to see evaluation as a "Process of providing information to those involved in a program regarding questions that need to be answered". In evaluating the maritime educational system in Mexico, it is necessary to focus on the basic elements which, according to the author, need improvement in order to obtain proper development in this area.

Taking into account the description made of the existing organizational framework and the analysis of its structure,
the following considerations can be highlighted:

1. - The development of Mexico's maritime system of education in the last decade has been considerable due largely to the support offered by the Federal Government. Notwithstanding, the progress made to date must be FURTHER DEVELOPED.

2. - The HUMAN RESOURCES, referred to in Chapter 1 metaphorically as the fuel of the vessel, will play a key role in this further development.

3. - It is essential to provide a safe working environment for employees so that an EMPLOYEE WORK FORCE that is highly competent can be maintained.

4. - Salaries, incentives and concern for employee job satisfaction are some of the factors that might affect the RECRUITMENT PROCEDURES.

5. - It is necessary to modify and up-date the outline of JOB DESCRIPTIONS (Duties and responsibilities at work) in order to maximize both employee involvement and individual efficiency.

6. - Moreover, when job descriptions are well defined, HIGH OPERATIONAL EFFICIENCY can be achieved throughout the management structure and in all areas of the system.

7. - Different factors such as: adjustments to curriculum, implementation of new courses, new requirements set by I.M.O. conventions, future needs in shipping, etc., have to be taken into account when striving for VERSATILE AND COMPETENT PERSONNEL ABOARD.
8. Each of these factors requires the existing organizational framework to have not only a stable labour force, but also the PERSONNEL WITH THE CAPABILITY to adapt the system to future national and international needs.

9. It is within the context of STAFF DEVELOPMENT that the skills of human resources can be enhanced, not only at the lecturer level but at the management level too.

10. Since staff development is now in its earliest stages of development in the system, it is necessary to emphasize its importance and role within the context of maritime education in Mexico.

11. There are other factors related to maritime education, such as: the establishment of new courses in all three maritime colleges, the investments required to implement these courses, the purchase of new simulators, etc., which require the development of LONG-RANGE organizational goals.

12. Although the programs based on STRATEGIC PLANNING involve the participation and commitment of the Technical Committee in Mexico City, it is fundamental to define and identify the practices and procedures that need to be in place throughout the organization in order to achieve the overall goals.

13. Furthermore, it is essential to ensure that the new programs are fully integrated into the current objectives of the organization, so that they can achieve the results desired, survive over time, and be accepted and supported by all the people within the organization.
14. While the implementation of new programs involves the participation of all in the maritime educational system, the EVALUATION process falls partly upon the lecturers when the students are at college, and partly upon the shipping companies after the students graduate.

15. The development and implementation of follow-up programs which include the active participation of both the MARITIME ADMINISTRATION and the SHIPPING COMPANIES, will provide the maritime system of education with the necessary feedback to improve the courses being imparted which are the most significant factors in the success of this unique organization.

2.8 CONCLUSION

In the last four decades the shipping industry has undergone radical changes in many different areas: navigational aids, main and auxiliary engines, cargo systems, shipboard management procedures, etc. Therefore, it has become essential for new officers to be highly trained to operate modern vessels safely and economically.

The maritime system of education in Mexico has to evolve a pattern which is compatible with the requirements of the national shipping industry and the international standards of training not only today but which also meet these needs in the future.

The following Chapters analyse each one of the factors which according to the evaluation of the existing organizational framework may weaken the development of the SYSTEM OF MARITIME EDUCATION IN MEXICO.
CHAPTER

3

THE HUMAN RESOURCES

The neglect of human resource concerns encourages the formulation of unrealistic plans that recognize neither the fundamental constraints nor the tremendous opportunities that inhere in the human capital of the organization.....

3.1 INTRODUCTION

The objective of this chapter is to provide a systematic and simplified procedure for human resource management which can be applied to the maritime educational system of Mexico in order to overcome the challenge of obtaining and maintaining an effective work force.

Figure 3.1 indicates the frameworks utilized in this procedure. At the same time, the model represents an outline of the organization and content of the present chapter. The close relationship between the four areas can be established as follows:

1) JOB ANALYSIS.- The information obtained in this area can be utilized to define the capabilities required to per-
FIG. 3.1 HUMAN RESOURCE MANAGEMENT MODEL.
form current and new jobs in the organization. Furthermore, this data will be essential to the development of human resource programs.

2) HUMAN RESOURCE PLANNING.- This step is taken to determine both the organization's present needs (inventory) and the need for additional human resources due to expansion or growth (future demand).

3) PERSONNEL INTEGRATION.- This stage is the practical application of the human resource programs. Therefore, it is necessary to implement this step in accordance with the results obtained when planning.

4) ROLE OF ORGANIZATION.- It is the task of the organization to support all three steps referred to above in order to meet its manpower needs. Moreover, it is necessary to establish the required policies to:
   a) Allow realization of each individual's full potential and self-satisfaction, and
   b) Achieve a stable employee force which is in the interest of the organization and the country.

3.2 JOB ANALYSIS

As was stated in section 2.7, it is necessary to modify and update the outline of job descriptions of the maritime system of education in Mexico. The reasons, argued by the author, can be summarized as follows:

a) The collection of job analysis information was carried out with a minimum of consultation with the personnel (excluding directors).
b) There have been some changes in the organization since then. The upgrading courses department was added to the system.

c) Salaries are paid in accordance with the information given in this outline, which does not accurately represent the work done or the necessary qualifications needed at each level of work.

3.2.1 COLLECTION OF JOB ANALYSIS INFORMATION

The collection of information required to develop job descriptions and job specifications can be obtained in two parts:

- PART 1. GENERAL UNDERSTANDING OF THE ORGANIZATION:
  a) Purpose (educational at different levels).
  b) Design (organizational chart).
  c) Procedures (lines of communication and delegation).
  d) Output (new officers, ratings, etc.).

- PART 2. IDENTIFICATION OF JOBS:
  a) Jobs analysis (organizational charts, payroll records).
  b) Employee observation (human characteristics-informal approach).
  c) Workplace observation (working conditions-informal approach).
  d) Questionnaire development (job analysis schedules/checklists).
  e) Information collection (interviews, co-counselling, delphi-technique, etc.).
There is no one best way to gather all this data. Most of the time the analyst presents to the organization an evaluation of the trade-offs between cost, time and results associated with each method.

In this particular case the decision of adopting and implementing one method or some combination of them will rely upon the Technical Committee in Mexico City.

Due to the existence of different institutions in the maritime educational system in Mexico, it will be necessary to develop different job analysis schedules/checklists in order to analyse the different posts. Nevertheless, similar jobs should be studied with identical checklists so that the same criteria can be applied during the interviews. Figure 3.2 shows an abbreviated checklist form utilized in this procedure.

### 3.2.2 JOB DESCRIPTION

A job description is a written statement that explains what the job holder should do (duties), and the way in which the organization wants him/her to do it (responsibilities). Figure 3.3 illustrates a basic form which can be used to develop clear and comprehensive job descriptions.

Furthermore, this pattern may be sub-divided into different levels at each stage if the organization wants to go beyond this basic statement. Therefore, entries that overlap the contract of employment, training purpose entries, equipment, products or services involved, can be included.
3.2.3 JOB SPECIFICATION

Job specification is the second stage in building-up a human resource information system. While the job description defines the way in which the job should be done ( duties and responsibilities ), the job specification details the demands which are required by the individual ( human factors ) in order to carry out the duties involved in the job. These requirements can be classified in three groups:

1) EDUCATION: Academic level ( high school, college )
   Training ( courses, on-job training )
2) SKILLS : Experience ( previous jobs, assignments in the same department, etc. )
   Physical demands ( coordination of senses, strength, etc. )
3) ATTITUDES: Mental demands ( initiative, patience, judgement, etc. )
   Hygiene ( personal, environmental )

Figure 3.4 shows an example form of job specifications. Nevertheless, this pattern may be enlarged so that the organization can determine more accurately the physical and intellectual abilities that are needed.

3.2.4 HUMAN RESOURCE INFORMATION SYSTEM

All the efforts ( time and money ) spent in developing questionnaires, collecting information, designing appropriate patterns of job descriptions/specifications and organizing the data in a way which is ready to use are factors that must be taken into consideration when building-up a human
resource information system. Notwithstanding, time and money are meaningless when compared to the benefits offered by this process.

The following statements will help to contemplate some of these advantages:

1) **JOB HOLDER.** - The employee will have a better understanding of his work. Consequently, he will be more involved and effective.

2) **DEPARTMENT MANAGER.** - The manager will better understand the performance standards. As a result, evaluations can be made with possibilities of growth, advancement and employee recognition in his/her department.

3) **ORGANIZATION.** - The organization will achieve a higher operational effectiveness in general. Specifically in terms of:
   - Job design/redesign.
   - Performance standards establishment.
   - Safety standards practice.
   - Human resource planning.
   - Evaluations development.
   - Reward systems.
   - Post hierarchy.
   - Staff development guidance.

Topics related to human resource planning and reward systems will be discussed in the following sections of the present chapter, while the matters related to staff development will be discussed separately in chapter 4.
1. JOB ANALYSIS STATUS
   1.1 Place of revision
   1.2 Date of revision
   1.3 Date of completion
   1.4 Previous place of revision
   1.5 Previous date of revision
   1.6 Name of analyst

2. JOB SPECIFICATION
   2.1 Job title
   2.2 Other title
   2.3 Division
   2.4 Department
   2.5 Supervisor title

3. JOB SUMMARY
   3.1 Describe briefly the purpose of the job:

4. LINES OF COMMUNICATION
   4.1 Upwards
   4.2 Laterally
   4.3 Downwards

FIG. 3.2 JOB ANALYSIS QUESTIONNAIRE FORM.
5. DUTIES

5.1 Primary duties

___ 5.1.1 Managerial
___ 5.1.2 Professional
___ 5.1.3 Technical
___ 5.1.4 Clerical
___ 5.1.5 General Services
___ 5.1.6 etc.

5.2 Major duties - time involvement ( % )

5.2.1 ____________________________

5.2.2 ____________________________

5.2.3 ____________________________

5.3 Other duties - time involvement ( % )

5.3.1 ____________________________

5.3.2 ____________________________

5.3.3 ____________________________

5.4 Performance standards of these duties :

______________________________

______________________________

______________________________

5.5 Required training to obtain performance standards :

______________________________

______________________________

6. RESPONSIBILITIES

6.1 Responsibility - significance ( 1=minor, 2=medium, 3= major )

___ Use / maintenance of tools ___ Use / Protection of materials

FIG. 3.2 ( Continued )
7. HUMAN CHARACTERISTICS

7.1 Characteristic - significance (1=minor, 2=medium, 3=重大)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>Hearing</td>
</tr>
<tr>
<td>Speaking</td>
<td>Smell / taste</td>
</tr>
<tr>
<td>Hand / eye coordination</td>
<td>Overall coordination</td>
</tr>
<tr>
<td>Strength</td>
<td>Height</td>
</tr>
<tr>
<td>Health</td>
<td>Initiative</td>
</tr>
<tr>
<td>Judgement</td>
<td>Attention</td>
</tr>
<tr>
<td>Reading / writing</td>
<td>Arithmetic</td>
</tr>
<tr>
<td>Other, etc.</td>
<td></td>
</tr>
</tbody>
</table>

7.2 Education / experience

7.2.1 Academic level

7.2.2 Experience required: time

As (job title)

7.2.3 Training as substitute for experience

7.2.4 Required training

8. WORKING CONDITIONS

8.1 Physical conditions
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2</td>
<td>Psychological demands</td>
</tr>
<tr>
<td>8.3</td>
<td>Relevant / unique conditions</td>
</tr>
<tr>
<td>9.1</td>
<td>Health / safety hazards associated with job</td>
</tr>
<tr>
<td>9.2</td>
<td>Safety training / equipment requirements</td>
</tr>
<tr>
<td>10.1</td>
<td>How is the performance of this job measured?</td>
</tr>
<tr>
<td>10.2</td>
<td>Which identifiable factors contribute to the performance of this job?</td>
</tr>
<tr>
<td>10.3</td>
<td>What type of feedback is required to improve performance?</td>
</tr>
</tbody>
</table>

FIG. 3.2 (Continued)
11. EMPLOYMENT CONDITIONS

11.1 Hours of work: from ____________ to ____________
other ______________________

11.2 Days of work: from ____________ to ____________
other ______________________

11.3 Basic salary: _________________________________

11.4 Compensation / bonuses: ______________________

11.5 Overtime (rate): _____________________________

11.6 Vacations: number of days ____________________
from ____________ to ____________

11.7 Other etc.

12. COMMENTS

Aspects of this job that should be noted __________________
____________________
____________________

Approved by:

__________________  ____________________
Job Analyst            Department Manager

FIG. 3.2 (Continued)
<table>
<thead>
<tr>
<th>Job title</th>
<th>Job code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division</td>
<td>Job grade / level</td>
</tr>
<tr>
<td>Department</td>
<td>Salary</td>
</tr>
<tr>
<td>Supervisor (title)</td>
<td>Date</td>
</tr>
</tbody>
</table>

**Job summary:**

**Job duties:**

**Lines of communication:**

**Working conditions:**

Approved by:

---

**Job Analyst**

**Department Manager**

**FIG. 3.3 BASIC FORM OF A JOB DESCRIPTION.**
**VERACRUZ MARITIME COLLEGE**  
*(JOB SPECIFICATION)*  
Form H.R.-3

<table>
<thead>
<tr>
<th>Job title</th>
<th>Job code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division</td>
<td>Job grade / level</td>
</tr>
<tr>
<td>Department</td>
<td>Salary</td>
</tr>
<tr>
<td>Supervisor (title)</td>
<td>Date</td>
</tr>
</tbody>
</table>

**General requirements:**  
Academic level  
Training  
Experience  
Physical demands  
Mental demands

**Specific duties:**  
Duty Nr. 1  
Knowledge  
Skills  
Attitude  
Duty Nr. 2

**Working conditions:**  


**Approved by:**  


---

**FIG. 3.4 BASIC FORM OF A JOB SPECIFICATION.**
3.3 HUMAN RESOURCE PLANNING

In the last decade, the maritime system of education in Mexico has undergone several changes which have been explained in chapter 2. Therefore, it has been a difficult task to ensure that the system has an adequate supply of human resources at all levels year after year.

Based on the considerations expressed in section 3.2, once the human resource information system of the organization is implemented, the following step will be to develop a human resource planning program.

In order to establish a manpower planning system in the organization, it is necessary to take into account the following:

1) Inventory of the current human resources at work,
2) Future potential of these individuals, and
3) Future demands of the system.

3.3.1 HUMAN RESOURCE INVENTORY

The inventory of human resources is carried out with the purpose of knowing not only the number of employees within the organization but the capabilities found in the organization's work force. Therefore, it is essential to evaluate each employee's skills and abilities so that an accurate appraisal can be conducted.

This information will allow the analyst (planner) to contemplate the particular possibilities of each employee so that the individual in question can be reassigned to new posts or transferred or promoted.

On the other hand, there may be possibilities of retirements,
resignations, commissions, etc. which have to be taken into account.

The basic steps of developing an inventory of human resources can be summarized as follows:

1) To establish the personnel census.
2) To establish evaluation systems (based on job analysis questionnaire).
3) To classify the human resources (according to job requirements and according to employees' abilities and skills).
4) To determine the inventory.

3.3.2 FUTURE NEEDS IN HUMAN RESOURCES

The future demand for staff of an organization can be considered in two parts:

1) Short-range needs.- To identify job openings that must be filled during the coming year. These needs may be found when doing the inventory; e.g.: resignations, future promotions, etc.
2) Long-range needs.- To estimate the human resource situation in the following two or three years. These needs may be caused by organizational demands (strategic plans, growth, retirements, etc.) or by external demands (economic, technological, etc.).

The process of estimating future demand in the organization can be summarized as follows:

1) Formulation of future organizational charts (based on strategic plans).
2) Determination of job descriptions/specifications for new posts.
3) Estimation of future vacancies, caused by retirements, leaves, etc., as accurately as possible.
4) Grouping and classification of future needs (long/short-range).

Although, the process of estimating future human resource needs can be described in four lines, human resource forecasts need the adoption of methods which might range from informal to sophisticated. The results obtained from these methods are approximations which can be useful to the organization when implementing human resource programs.

Taking into consideration the size of the maritime system of education in Mexico (around 700 people), its management structure and its configuration, the author has adapted from the literature available a method which might be useful in the organization. This method can be summarized as follows:

1) A coordinator should be selected to be in charge of the process. It would be preferable to select a person from within the organization because of his/her understanding of the jobs, policies and procedures of the system.

2) The coordinator has to start surveying department managers, because they know their departments best. This step may show the coordinator the short-range needs of each department.

3) These results have to be compared to past trends, so that the coordinator can apply his/her knowledge, experience and criteria. For example: One full-time professor for
every ten or twelve students, one secretary for every
twenty-five students, one laboratory instructor for every
twenty or twenty-five students, etc.

4) The next step is to contemplate strategic plans of the
organization for the coming two or three years. This will
have two purposes:
   a) to take into consideration new organizational charts,
      e.g. new functions, new divisions.
   b) to make a second survey at each department, for man­
      agers to estimate their manpower needs in accordance
      with overall long-range objectives, e.g. new func­
      tions, expansions, etc.

5) After this, it will be necessary to hold a meeting with
principals and deputies of the maritime colleges, the
Training Ship and the Training Center, each institution
at a time. At this stage the coordinator could present
the results obtained from the first and second survey and
from past trends as well in order to obtain a final re­
result.

6) This process can be repeated from point two to point five
in order to obtain a more accurate forecast. Neverthe­
less, the time and money invested may not justify the
gains in effectiveness.

3.3.3 HUMAN RESOURCE PROGRAM

At present the maritime educational system in Mexico provides
education and training in the following fields:
a) Forming of officers (deck and engineering).
b) Upgrading courses for officers (deck and engineering).
c) Forming of radio-officers.
d) Training of ratings.
e) Training of port operators.

In the case of the maritime educational system in Mexico, the development of human resource programs should basically encompass the needs related to education and training such as:

a) Qualified deck and engineering officers who might be needed at:
   - the maritime colleges: formation department.
   - the training-ship: academic/operative departments.
   - the training center.

b) Qualified Masters and Chief engineers who might be required at:
   - maritime colleges-upgrading courses department.
   - training-ship.
   - training center.

c) Qualified petty officers and port operators who might be required at:
   - maritime colleges.
   - training-ship.
   - training center.

The reasons, argued by the author, for focusing the human resource programs mainly on educational necessities are the following:
1) The wide range of educational activities covered by the Mexican system of maritime education.
2) The lack of available maritime personnel to perform part-time activities in the system, due to the nature of their jobs.
3) The possibility of obtaining administrative personnel to perform part-time activities.
4) The availability of human resources to perform clerical or secretarial duties.

Furthermore, it will be necessary to consider the staff development needs. This process should include the following:

1) Training required by newcomers to the organization in order to perform their jobs properly.
2) Training required by personnel who might be promoted or transferred.
3) Training required by existing personnel in order to perform their jobs properly.
4) Training required by existing personnel so that new organizational procedures might be introduced.
5) Grouping and classifying the staff development needs.

In this way, the program of human resources can be summarized as follows:

1) SHORT-RANGE NEEDS:
   a) potential promotions/transfers.
   b) personnel requirements.
   c) training requirements.

2) LONG-RANGE NEEDS:
   a) potential promotions/transfers.
   b) personnel requirements.
   c) training requirements.

3) SCHEDULE:
   a) possible dates of transfers/promotions.
   b) required time for training.
   c) possible dates of integration.
4) CLASSIFICATION:
   a) hierarchy of needs.
   b) classification of training needs.
   c) budget calculation.

The adoption of human resource programs may be a difficult decision to take because of the time and money required to carry them out. Nevertheless, at subsequent programs these parameters (time and money) are reduced by the experience acquired during the first program.

3.4 PERSONNEL INTEGRATION

Personnel integration is a stage in the process of human resource management which represents the application of results obtained in the human resource program. As a consequence of implementing this step properly, the maritime system of education in Mexico will have the possibility of achieving a stable supply of personnel which is highly competent.

The present section has been divided into three parts: recruitment, selection and orientation programs, according to the model presented at the beginning of this chapter. Moreover, its main objectives can be summarized as follows:
- to achieve the timely incorporation of personnel, according to the forecasts of the human resource program.
- to carry out the reassignments, transfers and promotions, established in the program, to fill job openings (internal supply).
- to assure the suitability of new personnel (external supply), and their proper orientation into the system.
3.4.1 RECRUITMENT

Recruitment is the process of finding and attracting capable applicants to apply for employment. This process covers the period from the initial seeking of new recruits until the submission of applications.

Recruitment procedures may vary from organization to organization. In the particular case of this paper, the process can be briefly described as follows:

- **RECRUITMENT SOURCES:**
  The shipping companies in Mexico are the only source of applicants to fill the job openings created at lecturers level (specialized support personnel).

- **SPECIFIC RECRUITMENT SOURCES:**
  Among the shipping companies, there is the possibility to identify the most suitable source of recruitment, taking into account the specific needs of the organization, e.g. the relationship between the subject to be taught and the type of ship on which the potential applicant is working.

- **INFORMATION MECHANISM:**
  It is essential to develop, within the context of the organization, information mechanisms so that the potential applicant may know the job, the benefits, and how to apply for the position. This information may consist of one or two pages, so that it may be posted at the maritime colleges, and at the officers associations, or placed in maritime journals.

- **RECRUITMENT:**
  The applications might be collected at the maritime colleges, or at the central office in Mexico City.
Recruitment procedures in general shall be in accordance with the human resource program. However, they might be constrained for several reasons; some of the most common constraints found in the maritime educational system in Mexico can be explained as follows:

- **PAY POLICY:**
  Until now, the salaries being offered in the system are below the salaries offered by shipping companies. Moreover, they are the lowest among the different educational institutions at the same level.

- **HUMAN RESOURCE PLANS:**
  The future needs in human resources are estimated in a subjective way. Moreover, this appraisal may be affected when the budget is accepted.

- **ENVIRONMENT:**
  a) Due to constant adjustments to the currency of the country (devaluations), the salaries are reduced more, because wage adjustments are carried out on a yearly basis.
  b) Due to the fluctuations of the national economy (inflation), the budget may be affected, so that the system has to wait one or two years more to fulfill its manpower needs.

### 3.4.2. SELECTION

Selection is the process used to decide which applicants should be hired. This process covers the period from the point at which recruits submit their applications to the moment the hiring decision is made. The required steps to
properly complete this operation are the following.

- RECEIPT OF APPLICATIONS:
  To compare job descriptions/specifications with those capabilities described on each application form.

- EMPLOYMENT TESTS:
  To obtain relatively objective information about the applicants, that can be compared.

- INTERVIEW:
  To evaluate the applicants' acceptability; in this case, the interview allows a two-way exchange of information.

- EVALUATION:
  To compare the applicants' capabilities; this step must take into account the three earlier steps.

- HIRING DECISION:
  This marks the end of the procedure. The most suitable applicant is notified and notification is made to the other applicants.

For the proper application of the process to the scope of this paper, the following can be highlighted:

a) The maritime system of education in Mexico is the only system which provides education and training to officers within the context of the national shipping industry.

b) Therefore, the background of each officer, concerning education, can be obtained at the maritime college from which he graduated.
c) Furthermore, the recruitment and selection processes can be focused on those officers whose educational backgrounds are the best.

d) The only step left to verify is if the experience obtained during their sea service gives them the sufficient abilities to occupy the vacant post.

3.4.3 ORIENTATION PROGRAMS

Orientation programs help new employees familiarize themselves with and understand the social, technical and cultural aspects of the workplace. Furthermore, they help employees comprehend what will be important to their jobs success, and speed up the socialization process and acceptance into the work group.

From the literature available, the author has conformed an orientation program which can be utilized within the context of the maritime educational system in Mexico. The program has been divided into two parts:

- PART A. PERSONNEL DEPARTMENT'S ROLE:

  1) BRIEF LECTURE ABOUT ORGANIZATIONAL ISSUES.- To explain and identify policies and procedures, facilities, job relationship, and key executives (names/departments). In this session, the worker should be given an employee handbook which describes the policies and benefits of the organization, a copy of his job description/specifications and a hand-out which comprises the lecture's information in a few pages.
2) BRIEF DISCUSSION ABOUT EMPLOYEE BENEFITS.- To talk about pay scales/pay days, vacations/holidays, working hours/rest breaks, incentives/promotions, and training/development benefits.

3) CLOSING SESSION.- To answer some questions which the new employee might want to have answered.

4) TOUR OF THE INSTITUTION.- To visit classrooms, laboratories, simulators and to meet some of the managers or employees. The tour should end with a visit to the workplace and the introduction of the new worker to the department manager.

- PART B. DEPARTMENT MANAGER'S ROLE:

1) INTRODUCTION TO CO-WORKERS.- To initiate the socialization process and acceptance into the work group.

2) JOB DUTIES.- The new employee should be given an overview of the work performed in the department, making emphasis on his particular duties, the relationship to other jobs in the department and the job safety requirements.

3) INTRODUCTION TO TRAINER.- This will mark the end of the orientation program and the beginning of the training program (chapter 4).

3.5 THE ROLE OF THE ORGANIZATION

In the last sections (3.3 and 3.4), the processes required to achieve a STABLE PERSONNEL'S SUPPLY, within the context of
maritime educational system in Mexico which is highly competent, has been explained. It is now essential to highlight the procedures involved in MAINTAINING A STABLE LABOUR FORCE which, according to the author, is a prerequisite for the development of the organization.

In order to emphasize the role of the organization in completing the human resource management program, as well as to facilitate the appreciation of the process this section has been divided into three parts: compensation programs, motivation systems and employee communication.

The organization of this section follows, to a certain extent, the model of Maslow's hierarchy of needs, in which it can be assumed that the individual works to fulfill a series of needs. Furthermore, since all needs cannot be expressed at once, they tend to have some priority in which they find expression. Maslow's hierarchy of needs are classified in the following categories:

a) PHYSIOLOGICAL:
   The basic need for food, clothing, shelter.

b) SAFETY:
   The need for security, continuity, protection against anything that threatens an organized orderly existence.

c) SOCIAL:
   The need to belong and be accepted in a social context.

d) ESTEEM:
   The need for recognition by others or a personal sense of growth and achievement.

e) SELF-FULFILMENT:
   It is only met when people become all what they consider to be the maximum they are capable of becoming in life.
For a specific time and circumstance, different people within an organization are denominated by different needs; therefore, the maritime system of education in Mexico should focus on different approaches for providing their employees with the basic conditions to fulfill their needs in order to maintain them. The following parts of this section contemplates some of these approaches.

3.5.1 COMPENSATION PROGRAMS

Compensation is what employees receive in exchange for their work. When compensation is made properly, employees are more likely to be satisfied toward organizational objectives. When wages and salaries are not administered properly, the organization may be affected in one of two manners:

- The employees' performance will decline dramatically, or
- The employees will search for a higher-paying job.

The main reason, to the aforesaid reactions, is that the employees' basic needs (PHYSIOLOGICAL AND SAFETY NEEDS) are not met.

Therefore, all the money spent in human resource programs (recruitment, selection and development) may be lost.

Within the context of the system of maritime education in Mexico, the salaries are paid in accordance with the existing outline of job descriptions, and due to the reasons established by the author in section 2.6, 2.7, 3.2 and 3.4.1, the salaries are not competitive.

In order to implement a compensation program within the system, it will be necessary to follow the following steps:

- To correct the job descriptions' outline, so that the in-
formation utilized in evaluating jobs is accurate and up-to-date.
- To evaluate the jobs, in order to obtain the ranks for each post and to set their basic salaries accordingly, and
- To evaluate individual personal skills, so that the employee can be differentiated from the others because of his loyalty, experience or abilities.

Compensation programs should be based on objective measures rather than subjective ones; those measures should include conditions where pay can be effectively related to performance.

The following is a basic example of a mixed compensation program model:

- GROUP PLANS:
  a) Job salary (from job description).
  b) Tax (tabulated).
  c) Savings fund (to be paid quarterly).
  d) Social security (tabulated).
  e) Insurance (tabulated).

- INDIVIVUAL PLANS:
  a) Seniority (5, 10, 15 or 20 years' bonus).
  b) Education (bachellor degree, M.S.C. or PH.D. bonus).
  c) Training (pedagogy, human relations, etc.- a bonus may be granted for having participated in each course)

The inclusion of individual plans in the compensation program will help to develop a flexible, relatively permanent workforce that is oriented toward loyalty, learning, growth and development.

Moreover, the aforesaid measure will deviate the organization from the hierarchical system which generally pay people
greater amounts of money as they move higher up the organization, in order to retain specialized support personnel and experts in non-management roles or lower level management roles.

3.5.2 MOTIVATION SYSTEMS

Once the basic needs of the individual have been contemplated in the compensation program, the next step will be to consider the needs that might affect the performance of employees in the organization. Motivation is a function of understanding those needs that can influence individuals to perform in particular ways so that they contribute to the effectiveness of the organization. Therefore, an organization that is able to tie valued rewards to the behaviors it needs to succeed is likely to find that the motivation system is a reinforcement to its structure and development.

Motivating employees is the most difficult daily task that managers may face because of the problems involved in finding out what their needs (MASLOW'S HIERARCHY OF NEEDS) are at that specific time and place. Furthermore, the managers might have limited flexibility in offering rewards due to the constraints arising from the organization itself.

When trying to adopt a motivation model, the organization should take into account the different jobs performed in the system. Moreover, it will be essential to highlight the following:

- Rewards must be based on objective measures so that results will not be negative.
- Rewards must be given periodically so that high performance continues for a long period.

there are many ways to motivate people to perform better. Nevertheless, the author has chosen those examples that, according to his experience, can be utilized within the context of maritime education in Mexico to improve employee performance.

- RECOGNITION:
  After evaluating the professors' performance by students (every six months), it would be (nice) to give diplomas of recognition to the best professor of each group (there are four groups at each maritime college). Moreover, it would be possible to give small gifts such as: pocket calculators, tie-pins, flowers, etc. to them, as well as to those in the second places. This act could be carried out in a ceremony with students, personnel and families present.

- MONEY:
  In the same way, bonuses could be included in the wages, to those whose performances have been beyond reproach. These bonuses should be given every month to the professors until the next evaluation is made.

- WORK ITSELF:
  The best performers should have given priority in the selection of their subjects or arrangement of schedules in order to achieve better effectiveness, for example:
  a) One professor may want to teach navigation in the second semester (NAV-I), to different groups year after year to improve his performance in that specific subject, or
b) He may want to teach navigation to the same group from the beginning to the end (NAV-I, NAV-II and NAV-III) to provide continuity in the course.

c) On the other hand, the professor may want to teach during morning hours from 0800 to 1000 for example, or during the afternoon.

- ADVANCEMENT:
  Depending on the professor, the motivation reward can be translated into promotions, special assignments or new responsibilities to obtain more experience.
  One activity to cover in this aspect is the development of materials in the form of booklets for each subject being taught. Up to now this area has not been covered because of the lack of rewards to motivate personnel.

- PERSONAL GROWTH:
  Some professors may be motivated to perform above the standards just because they may obtain fellowships or the opportunity of attending seminars or courses as representatives of the college. These courses can augment their knowledge and of course, as it was stated in the last section, a series of bonus could be added to their basic salary for each course attended.

- AUTONOMY:
  Best performers may be granted more flexible working hours which may give them the opportunity to prepare their lectures at home when they have no classes.
  Alternatively, they may get financial support from the college to develop new projects.

- PRIZES:
  Although prizes may include small gifts, this point is
used to refer to big presents such as: family dinners, vacation trips, etc. which may be granted to professors whose performance has given them the first prize during the last three years for example.

It may be convenient to emphasize that all of these examples have been focused on professors; nevertheless, motivation can be introduced to all other areas in the organization so that all employees can react in a positive way to improve the overall functioning of the system.

3.5.3 COMMUNICATION POLICY

Organizations differ widely in how much information they communicate among their employees. Most of the time the position an organization adopts in this area may affect its overall performance. Nevertheless, the basic goal in implementing a communication program within an organization is to establish regular and open communication with all appropriate parties.

Some of the communication programs are essential to organization, while others are only complements of the communication policy in order to build the organization's reputation as a desirable place to work.

The following is a brief description of the communication programs which may be introduced into the maritime educational system in Mexico:

1) EMPLOYEE HANDBOOK:

This booklet should be given to new employees, generally when they are in the orientation program (suggested in section 3.4.3) in order to outline the organization's policies and benefits.
2) JOB DESCRIPTION / SPECIFICATIONS:
This is a two or three-page hand-out which describes duties and responsibilities required for a specific job; it should also be given to new employees during the orientation program, described in section 3.4.3.

3) COMPENSATION/MOTIVATION:
This is a five or six-page brochure which describes the reward system of the organization. It should be included as in the overall organization pay philosophy in order to enhance the effectiveness of the reward system, explained in section 3.5.1 and 3.5.2.

4) SUGGESTION PROGRAMS:
This may form part of an open-door policy, in which the employee is encouraged to recommend work improvements which may help managers to redesign jobs and to improve the quality of work life.

5) MAGAZINES/BULLETINS:
This might be complementary to the communication policy of the organization. Magazines might include the organization's activities, such as new projects, personnel, or students. On the other hand, the magazines might include educational topics, such as new navigational equipment, maritime developments, etc.

3.6 CONCLUSION
The maritime system of education in Mexico is faced with the challenge of improving the versatility and capability of its graduates.
As it has been stated in this chapter a supportive employee
workforce is the foundation of any organization; therefore, it is necessary for the organization to revert to its human resources in order to match this challenge.

In establishing HUMAN RESOURCE MANAGEMENT PROGRAMS, the organization should take into consideration every stage outlined in the present chapter. Moreover, as Figure 3.5 shows, the results obtained at each step are essential to the next in order to gain what is wanted at every organization: QUALITY OF WORK LIFE.
FIG. 3.5 FUNCTIONAL ORGANIZATION OF HRM PROGRAMS.
An effective and coherent training policy is essential to optimize employees' performance in pursuit of the organization's goals....

4.1 INTRODUCTION

The objective of this chapter is to propose a systematic process in the management of training and development of personnel within the context of the organizational system of maritime education in Mexico. In addition, the chapter introduces issues which are common to both training and development and the functioning of the total organization.

During the last decade the Trusteeship in charge of the maritime colleges in Mexico has been actively working on programs for the development of personnel. Some of these programs are listed below:

1) training for the use and maintenance of the planetarium installed at each maritime college.
2) training of the use and maintenance of the radar simul-
tor installed at each college.
3) studies at the World Maritime University.
4) short-courses in: administrative process, transactional analysis, human relations, etc.

Staff development programs, as stated above, usually have inconveniences, mainly because:
a) they are not systematically organized, and/or
b) they do not meet organizational requirements.

In order to bring together the training and development function with the overall functioning of the organizational system of maritime education in Mexico, it is essential to consider frameworks provided by manpower analysis and planning such as the one presented in chapter 3. Furthermore, as it was expressed in chapter 1, while human resources could be identified as a source of energy, training and development can act as the engine necessary to transform this energy into work.

Therefore, it is not sufficient to obtain and maintain a suitable workforce. These assets must be utilized as effectively as possible in pursuit of the organization's goals. In chapter 3, the necessity of having an orientation program which could help new employees familiarize themselves with the social, technical and cultural aspects of the workplace within the context of the maritime system of education in Mexico, was explained.

This program is one important link between human resource, and training and development management. Some other areas in common will be contemplated in the following sections which will help to complete the second step towards the required organizational system to properly de-
4.2 TRAINING AS A SUB-SYSTEM

The training and development function helps individuals, and consequently organizations to improve performance. In addition to the actual execution of training programs, comprehensive planning, control and evaluation are required to relate the programs to the systematic development of the organization.

Before specific functions concerning the development of human resources are dealt with, it is necessary to consider the fundamental importance of a formal system, where these functions can be integrated into a meaningful and effective whole.

Figure 4.1 shows a framework which attempts to gear the training as a sub-system to the organization in order to positively affect all the other departments. The central administration and control of the system is, therefore, an important function which enhances the systematization of training practices and standards among the units of the organization.

4.2.1 TRAINING POLICY

To complete the total adherence of the training and development function to the overall functioning of the organizational system of maritime education in Mexico, it is necessary to give the required support by the Trusteeship in Mexico City to the processes explained in the last section of the present chapter.
FIG. 4.1 CONCEPTUAL FRAMEWORK OF TRAINING AS A SUB-SYSTEM.
One of the ways of reflecting top management's general decisions is through policy-making. Policies indicate the position that top management adopts in the various situations with which it has to deal.

When referring to the training and development function, the policies constitute the mandate under which the training specialist works, that is, his authority, delegation power and areas of action. The following guide outlines the basic terms of reference for developing a training policy:

A) GENERAL:
   1) training in accordance with the organization's goals.
   2) training to meet performance standards.
   3) training to meet certain standards (personnel, facilities).

B) TRAINING SUPPORT:
   1) training of new employees.
   2) training of employees faced with new posts, equipment or procedures.
   3) training to maintain standards over time.
   4) training to maintain employees' flexibility and potential.
   5) encouraging employees to fulfill training requirements for higher posts.
   6) encouraging and supporting employees to satisfy their educational interests.

C) TRAINING SCHEMES:
   1) personnel manager to identify training needs of new employees.
   2) department manager to identify training needs of his subordinates.
   3) training manager to assist and advise personnel and
department managers.
4) employee to be involved in the planning, progress and evaluation of his own training.
5) department managers to accept members of other departments or institutions as part of approved training programs.

D) ORGANIZATION'S AGREEMENTS:
1) to accept visits from other educational establishments.
2) to accept visits from establishments related to the maritime industry.
3) to nominate employees to visit other educational establishments.
4) to nominate employees to visit establishments related to the maritime industry.

4.2.2 TRAINING NEEDS

Basically, the training and development system is fed by the results obtained from comparing job analysis and manpower planning (chapter 3), which can result in persons with higher or lower job-relevant skills and abilities. These differences will pose a dramatic effect on the level of training. Nevertheless, training needs can be grouped in four main categories:

a) new employees,
b) employees due to be promoted, or transferred,
c) employees scheduled to make use of new technology or new procedures, and
d) employees interested in fulfilling training requirements for a higher post (chapter 3, section 3.5.2 - motiva-
In order to make an effective identification of personnel training needs and to integrate and co-ordinate them within the context of the Mexican system of maritime education, it is necessary to prepare the following:

1) A clear definition of the objectives and procedures of the organization.

2) An organizational structure that encourages collaboration and communication between departments and between department heads and their subordinates.

3) A comprehensive up-to-date human resource information system, including work-history, performance and potential, recommendations for further work-experience and promotion, training and education.

4) A comprehensive up-to-date outline of duties and responsibilities, including job descriptions ( performance standards, and experience and training required ), and job specifications ( knowledge, skills and attitudes required ).

The aforesaid factors were discussed in chapter 3 and they are indeed the foundation of the framework presented in Figure 4.1.

The next step will be to establish the individual’s characteristics which can be grouped into three:

a) training need's category ( according to the list presented at the beginning of this section: a, b, c or d ),

b) employee information ( according to number 3 of the list
above), and
c) job demand (according to number 4 of the list above).

The entire process of identifying training needs can be put into practice within the context of the organizational system of maritime education in Mexico so that the expenses in developing a human resource information system and in obtaining and maintaining suitable employees can give positive results when implementing formal courses in staff development.

The following steps will provide practical guidelines to be utilized in the organization:

1) A coordinator should be selected to be in charge of the process. It would be preferable to select a person from within the organization because of his/her understanding of the jobs, policies and procedures of the system.

2) The coordinator should be given an annual staff performance report by department heads about their subordinate personnel. This step will show the coordinator the basic training needs of existing personnel.

3) The performance appraisal presented by heads of department should be a joint assessment of work with their subordinates both retrospectively and prospectively.

4) In order to encourage the open door policy (suggested in chapter 3, section 3.5.3 - communication policy), enthusiastic employees may be given special advice by the coordinator to schedule their own career development.

5) The coordinator should be given an annual report, consisting of an appraisal of the characteristics of poten-
tial recruits and their possible training needs by the personnel manager of each institution.

6) The coordinator should hold a meeting with directors, deputies, department heads and personnel managers at each institution. During this meeting the coordinator could present the draft of the training needs for personnel in order to obtain a complete agreement between the parties concerned and in accordance with the organization's policy.

7) After this, the coordinator will be in charge of designing a comprehensive training scheme to give participants in the training courses the required knowledge, skills and attitudes for the effective application to their jobs and at the same time to standardize practices and procedures throughout the organization.

4.2.3 TRAINING PROCESS

As it was established in the last section, the more concretely workers' jobs can be specified, the more likely it is that their training will emphasize skill development.

In order to develop and maintain an effective training system, it is necessary to establish a sequence of logically connected actions. The following list outlines the basic events involved in this process:

1) TRAINING DESIGN:
   a) goals to be accomplished,
   b) objectives to be achieved,
   c) topics to be developed.
d) methods to be utilized.
e) material and equipment to be utilized.
f) schedule to be followed.

2) TRAINING ACTIVITIES:
a) lecture preparation.
b) material and equipment preparation.
c) schedule and materials distribution.
d) lecture presentation.
e) class monitoring.

3) TRAINING EVALUATION:
a) data collection: class comments, assignments, class performance, questionnaires.
b) trainee’s work-performance.
c) department manager’s comments.
d) training design evaluation.
e) training activities evaluation.

4) FEEDBACK
a) training design improvement.
b) training activities improvement.
c) job re-design.

4.3 TRAINING COURSES

Because training is a learning process, it is essential, therefore, to begin by considering what is implied for the design of courses outlined in section 4.2.3. A training course is more than simply the sum of its parts. They all must be linked to a unified framework. First, it is necessary to assess the training needs; then, based on the needs assessment, the specific training objectives are de-
The following step is to consider the different approaches to achieve these objectives. There are many ways to develop a course; however, there are some practices which generally apply to the successful implementation of training courses:

1) objectives of the course should be based as much as possible on work needs.
2) course content should be logically derivable from the objectives.
3) course structure should be made in a way that allows a well-defined hierarchy of objectives.
4) course methods should be chosen to permit the complete involvement and participation of the trainee.
5) the overall design of training courses should be directed to create situations that will enable trainees to learn and apply those situations to real work conditions.

4.3.1 COURSE CONTENT

The content of training courses may seek to provide needed knowledge, to teach specific skills, to influence attitudes or any combination of the three. Therefore, it will be useful to determine the directions to be emphasized, and thereafter the type of course to be developed.

Courses can be divided into the following categories:

1) KNOWLEDGE-ORIENTED COURSES:
Courses designed to provide the student the subject matter included in them. Most pure science courses fall into this category.
2) METHODOLOGY-ORIENTED COURSES:
Courses designed to provide the students the guidelines to acquire procedures or skills. These courses can be divided into:
   a) Task-oriented courses which train the student to carry out some well-defined activities, and
   b) Discipline-oriented courses which teach the student a methodology that can be adaptable to a wide variety of circumstances.

3) MIXED COURSES:
Courses in which their various objectives may fall into different categories. These courses can be divided into:
   a) Issue-based courses which provide the student with concepts and methods for resolving an issue or problem, and
   b) Interdisciplinary courses which teach the student a topic or issue that brings together more than one discipline.

Once the directions of the course have been determined, the second consideration is whether or not specific learning principles are included.
Learning principles are guidelines to the ways in which people learn most effectively. These principles are:

1) PARTICIPATION:
Learning is generally quicker and longer lasting when the student can participate actively. The student is motivated to engage more senses and consequently to reinforce the learning process.

2) REPETITION:
Learning usually is reinforced by repetition. Key ideas
or events are stored in our memory so that they can be recalled when it is necessary.

3) RELEVANCE:
Learning is helped when the student can see the relevance of specific material, task or procedure. Therefore, the student commits himself to learn.

4) TRANSFERIENCE:
The closer the demands of the training program to the demands of the jobs, the faster a student will learn to perform the job. If equipment and tools resemble the actual workplace, the learning will be quicker.

5) FEEDBACK:
Learning can be guided when students receive information on their daily progress. The sooner the feedback is received, the sooner students can adjust their behavior to reinforce the learning process.

4.3.2 COURSE STRUCTURE

Once the directions of a course's content have been discussed, the next stage, in designing a training course, will be to consider its structure, so that the course is meaningful. Generally, a course is structured around a sequence of ideas which are dictated by the demands of the job. So, in ordering the context of a training course, the training specialist should try to arrange it in a way that reinforces the learning process.

Some of the possible sequences, a course or a part of it could take when in its planning stage, are the following:
1) TOPIC BY TOPIC:
The course may follow any sequence when the topics or themes included are more or less independent. The topics are in parallel rather than forming a necessary series, therefore, the training specialist can plan each section of the course, more or less disregarding the others.

2) LOGICAL:
The course may be arranged by following the sequence imposed by the priorities of understanding of the topics included in it.
The logical structure of a training course or a part of it may follow, among others, causal or chronological sequences.

3) SPIRAL:
The course may be arranged around a complete process but instead of going deeply into the process directly, the student is guided through different levels of difficulty to become acquainted with it.
At each level, new concepts are added to the process, until the final objective is achieved.

4) BACKWARD:
The course may be arranged around a complete process but instead of going deeply into the process, the student is guided to interpret it from the last to the first step.
At each new step, the student is reminded of the last step and taught to understand the subsequence in a backward chain.

The training specialist can identify two or more separate sequences for the same course to accomplish the goals established. Nevertheless, when structuring courses, it is funda-
mental to keep in mind that the sequence is such that it ensures learning.

4.3.3 COURSE TEACHING METHODS

In addition to the considerations made in the last sections, the course designer should examine the teaching methods available and to select the most appropriate for the learning objectives being considered.

In selecting a particular technique for a particular topic, the training specialist should evaluate the trade-offs involved in it. The selection of the best method depends on the following factors:

1) characteristics of the desired program content.
2) learning principles included in the program.
3) familiarization of the trainer with any particular method.
4) appropriateness of the facilities.

Some of the teaching methods utilized at present, in different fields, are the following:

1) APPRENTICESHIP:
   This method is generally handled by a more experienced employee or employees. The method provides a model for the trainee to copy of the different routines involved in the job. In addition, the apprenticeship program may be supplemented with formal classroom training. One classic example of this method is, the training programs for cadets, being used on board.
2) JOB INSTRUCTION TRAINING:
This method is similar to the one explained above, but instead of using an ordinary employee, the company assigns an instructor to teach trainees how to do their jobs. The training is provided through a series of carefully planned steps which emphasizes the relevance of the different routines of the job. The training pattern for officers in Mexico is carried out on board the T/S "Náuticas México" during the last year of the undergraduate program by following this method.

3) VESTIBULE TRAINING:
This method is carried out in separate areas, vestibules or workshops in which the same kind of equipment, material and tools to be used on the job are set up. In this way the training does not interfere with the normal daily operations of the workplace. This kind of training is practiced extensively in several maritime academies of the world.

4) SIMULATOR TRAINING:
Simulator training is designed to replicate the major characteristics of the work situation that are necessary to produce learning and transfer. Therefore, simulator exercises are aimed to produce to a certain extent:
   a) physical fidelity, and/or
   b) psychological fidelity.

Simulators can vary from games, case studies and role-playing methods to aircraft and ship handling simulators.

5) LECTURE METHOD:
This method is the most extensively used procedure in educational environments. The main reasons for its popu-
larity is that it offers relative economy and a meaningful organization of materials. Although lectures rely heavily on communications, most of the time they allow only one-way communication. More than in any other teaching method, the teacher is expected to play his best role so that the student is motivated to participate. When the teacher integrates discussions and clarification of material into his presentation his role is moved closer to that of a facilitator.

6) LABORATORY TRAINING:
This method, which is usually referred to as group learning, is primarily used to enhance interpersonal skills and to develop desired behaviors for future job responsibilities. The teacher usually serves as a facilitator and provoker of self-discovery. The process brings together two learning principles: participation and feedback.

7) PROJECT WORKS:
While the lecture method stands at one extreme of the teaching process, projects (independent learning) are part of the other end or decontrolled extremity. The project is a substantial program of study organized around a problem or topic. At the end, the work will result in a report, a portfolio of designs, a working model, etc. The teacher's role will be that of adviser; he will help the student to identify and formulate a relevant topic that is manageable in the time available. In addition, he will help the student to find sources of information, to organize the data, and in general to develop a methodology to determine the content of the topic.
8) PROGRAMMED INSTRUCTION:

In this method, self-instructional materials or programmed books are provided to systematically present information to the learner while, at the same time, the principles of reinforcement (repetition and feedback) are utilized. Three basic forms of PI are presented:

a) Auto-instructional method.- In this system, the student reads a question and chooses the appropriate response from a series of multiple-choice answers. Correct associations are immediately reinforced by a light or a buzzer, while incorrect responses are not reinforced.

b) Linear programming.- In this system, the material is presented in small units called frames. The student reads the frame and then fills in a blank with an answer. Since the program is predesigned in small steps, few errors occur. Moreover, the student is actively involved in the learning process because he usually receives immediate positive reinforcement.

c) Branching programming.- In this system, correct responses by the student lead directly to the next step of the program, while incorrect answers lead to a branch designed to correct the mistake. In addition, branching programs are designed so that superior students can proceed through larger steps, while students experiencing difficulty are directed into branching programs with smaller steps.

9) COMPUTER-ASSISTED INSTRUCTION:

In CAI systems, the student interacts directly with the computer, which has stored within its systems information and instructional materials necessary for the program.
The computer records the individual's previous response, analyses its characteristics, and determines the next presentation to the student on the basis of his needs. One variable of CAI systems is known as PLATO (programmed logic and automated teaching operations), and includes in its systems: capabilities for displays of all kinds, modifiable graphics and touch-panel inputs. In general, CAI systems are highly effective for training, especially for performance involving sequencing and procedural training.

### 4.3.4 COURSES' AUDIOVISUAL AIDS

Audiovisual aids are physical devices used by the teacher as an added means of communication to reinforce the learning principles that are normally brought into the training courses. They are used in conjunction with instruction when explaining a principle, demonstrating an operation or process or providing trainees with practical exercises in certain skills. Furthermore, training aids assist the learning process by adding realism and substance to ideas, descriptions and explanations given in words during the courses. Therefore, training designers cannot afford to neglect to employ appropriate audiovisual aids to the fullest extent possible.

The following is a compilation of the training aids which can be used in combination with different training methods:

1) blackboard
2) magnetic board
3) flannel board
4) newsprint pad
5) turnover charts
6) flash cards
7) photographs
8) wall charts
9) exhibitions
10) models
11) screens
12) episcope
13) overhead projector
14) slide projector
15) cassette-player
16) films
17) video-tapes
18) pocket calculators
19) pocket computers
20) micro-computers

4.3.5 COURSE EVALUATION

Evaluation of training is the systematic procedure necessary to collect descriptive and judgmental information about courses so that effective decisions related to the selection, adoption, value, and modification of various instructional activities can be made. As outlined in section 4.2.3, the evaluation process comprises different stages, the two basic goals being the following:

1) assessment of the trainees:
   - what and how well the students have learned,
2) assessment of the training course:
   - if the training design and training activities were appropriate.
Moreover, the evaluation process can last for many months; that is, it starts when the training needs are identified (knowledge, skills and attitudes possessed by the trainees), and it finishes several weeks after the course ends (new job performance of trainees at the workplace).

Nevertheless, the intention of this section is to contemplate the stages covering the period from the beginning of the training until the end of the training course, because it is, during this short period of time when the training specialist can obtain more or less objective information.

The evaluation process during this period is divided into three stages, and from the information collected, the training specialist will have to obtain the feedback necessary to evaluate and modify the training course to meet its goals.

The following is a brief description of the three above mentioned stages:

1) PRE-TRAINING STAGE:
   Evaluations at the beginning of the course are essential to determine the starting level of needs and consequently to assess any change following the training. The initial assessments, therefore, are essential to evaluate trainees and training course. The most common approaches used at this stage are:

   a) Knowledge tests.- They enable the trainer to assess the general level of the group and provide information which can be compared with later tests to determine changes which have taken place. The most common test approaches are:
      - open answer.
      - binary choice (yes/no, or true/false choice).
      - multiple choice (generally up to five choices).
b) Skills assessments.- The assessment of skills is often more difficult than knowledge tests, particularly those at management level. Most of the time participants are asked to complete a questionnaire related to the training content. In this questionnaire trainees are asked to rate on a scale how effective they think they are in a number of aspects which are included in the course.

c) Attitudes assessments.- These assessments, as the skills assessments, are done with the help of a questionnaire. The trainer, therefore, has to assume that the questionnaire is completed honestly and with the maximum awareness of the participant of his/her own feelings.

The use of self-assessment questionnaires has the advantage, at later stages, of permitting improvements to be expressed as percentages.

2) INTERIM TRAINING STAGE:
Evaluations at different points during the training course are necessary to determine to what extent the training is having an effect. If the required changes are not taking place, it may be necessary to modify the approach or the materials used by the instructor. The most common approaches used at this stage are:

a) Informal assessment.- It is practiced through observation by the trainer who has in mind a standard towards which the learners should be moving. Knowledge can be assessed by discrete questioning during a discussion; similarly, specific skills' tests can
be included as a part of a practical activity and consequently trainees' performance observed. Observation assessment, although subjective, plays an important role during the course, particularly for attitude-related courses.

b) Course audits.- They are useful to monitor the progress of the course and the attitudes of the participants, with a view to modify the material and the approach if necessary. Participants are asked to complete and audit sheet containing questions related to the topics dealt with during the day. Then, the instructor summarizes and analyses the information with the intention of using it initially as a discussion base at the start of the next day.

c) Formal assessment.- It can be done by using the same kind of assessments utilized at the pre-training stage. Generally this kind of assessment is made after one topic is finished or a series of sessions and activities are finished.
It is important to emphasize that assessments shall be made as long as the topics included in it are self-contained within the course and do not depend heavily on any other sessions or activities.

3) POST-TRAINING STAGE:
Evaluations at the end of the training course are important because it is at this stage that the instructor can differentiate between the abilities of the trainee prior to the training and his abilities after the training ends. The most common approaches used at this stage are:
a) Formal assessments.- The various assessments presented at the first two stages can be used at this stage as well. However, there is no necessity for the tests to be identical, only comparable.

b) Course content evaluation.- This is generally done through questionnaires in which the participants express their opinions and thoughts about the sessions, how much they enjoyed the training course, how much they learned from it and so on. The advantage of this approach is that the participants can look back over the course and assess the content, weighing up the relationships of one part with another.

Usually the questionnaires are divided into two sections. The first part of it consists of check-lists which have numbers allocated to scales with five divisions that go from Excellent to Bad or from Good to Not Good.

The second part of the assessment is a blank sheet of paper where the participants add comments about the important aspects of the course. This approach is useful for avoiding confusion arising from different semantic interpretations of the differential scale method utilized in the first part.

c) The 3-test approach.- This is a method used to avoid the subjectivity of attitudinal assessments. If self-assessments were obtained at the beginning of the course by means of diagnostic questionnaires, the same questionnaire can be used at the end of the course to determine any difference between the two. Next, the participant is asked to complete the questionnaire for the third time, but this time, he
will be rating the skills he had at the beginning of
the course but with his current perception of his
skills. Consequently, the third test is used as the true ini-
tial level and compared with the second test. Therefore, the trainer can obtain differences not only between test one and test two but between test two and test three as well, the second difference being more realistic.

4.4 CENTER FOR EDUCATIONAL STAFF DEVELOPMENT

In the last section, which deals with training courses, the most common approaches to course development were presented. It is now fundamental to consider the relationship existing between section 4.2 (training as a sub-system) and section 4.3 (training courses) to gear them into the organizational system of maritime education in Mexico.

On July 24th of 1984, the author presented a non-official report to the Secretary-General of the "Trusteeship for the Formation and Upgrading of Personnel for the National Merchant Marine" situated in Mexico City, consisting of personal viewpoints and referring to the evaluation of the Mexican maritime lecturers' annual meeting (mentioned in section 2.6), and to the perspectives for the improvement of the maritime education in Mexico.

In the last section of that paper, the author exposed some considerations concerning the establishment of an Educational Maritime Center to provide advanced education and training for specialized maritime personnel and the upgrading courses
for maritime officers as required by the I.M.O. as well. The basic suggestions expressed in the last section of the above mentioned paper were the following:

1) to utilize the infrastructure existing at one of the three maritime colleges for that purpose,
2) to increase the capacity for students at the other two maritime colleges, from 150 to 225 students.
3) to train the adequate personnel to impart the courses to be implemented.

Two years later, and with more involvement in the activities related to maritime education and training, the author utilizes the present section to develop still more the initial idea of establishing such an institution.

4.4.1 PURPOSE AND GOALS

The establishment of an advanced educational maritime center in Mexico will provide the necessary means to develop systematically not only the maritime education in Mexico, but the maritime industry in general as well.

First of all, this center would help to develop the personnel at each one of the maritime colleges and consequently the formation of new officers will be of higher standards.

Secondly, the center would help to develop specialized maritime personnel serving the maritime industry.

In addition, courses could be implemented to meet the requirements of the Mexican maritime industry and in accordance with national policies.

The scope and size of the activity of the institution will depend on the range of expectations that the Trusteeship in
charge of maritime education in Mexico would have regarding the responsibilities it wishes the new institution to carry out.

The author has considered the establishment of such an institution to be divided in four stages of development:

1) educational staff development,
2) maritime education development,
3) maritime industry development (national), and
4) maritime industry development (international).

The following outline describes briefly each one of the four stages:

1) EDUCATIONAL STAFF DEVELOPMENT:
   At this stage, the main purpose of the center will be to work upon the staff development problems in the organizational system of maritime education in Mexico, such as:

   - to produce the required training policy which is understood and supported by employees at all levels,
   - to work together with the personnel department and other departments to produce manpower plans, and job descriptions/specifications for the whole organization,
   - to work together with the personnel department and other departments in order to identify training needs, and consequently design training courses which fulfill the requirements of the organization,
   - to plan the overall program of the courses to implement taking into consideration all the training resources available (facilities, equipment, personnel, time, etc.).
- to implement the different courses considered in the training program.

2) MARITIME EDUCATION DEVELOPMENT:
The second stage of the center will have as its main objective the identification and work upon the major problems in the maritime educational field by:

- providing a training advisory and information service for faculty working in the organization,
- undertaking projects and studies to improve the quality and efficiency of the undergraduate program.

3) MARITIME INDUSTRY DEVELOPMENT ( NATIONAL ):
Once the internal training needs of the organization have been considered, the next step will be to take into account the national and international requirements for personnel working in the maritime field. At present, most of the upgrading courses required by national and international regulations have been implemented at each one of the maritime colleges in Mexico; therefore, the main objectives at this stage will be:

- to concentrate all the activities related to the upgrading department into the Maritime Educational Center. As a result, the costs will be reduced and the courses will be standardized even more than at present ( chapter 2, sections 2.3 and 2.6 ).
- to conduct research and thus to identify further training needs for the personnel working in the maritime industry, as requested by the different companies, and
- to design and implement tailor-made courses based on the training needs mentioned above.
4) MARITIME INDUSTRY DEVELOPMENT (INTERNATIONAL):

The fourth stage of development of this center will be to extend its area of action to cover all the Latin American Countries. At this stage of development, the center would have the required capabilities and facilities to undertake such a commitment. Practically, the objectives to achieve will be the same as the ones mentioned above in paragraphs 1, 2, and 3, but this time the courses should be restructured in a way that allows the standarization of the practices in the maritime industry in all Latin American Countries.

4.4.2 ORGANIZATION AND ACTIVITIES

It is suggested in the last section that the Advanced Educational Maritime Center should be established in four stages of development. By following the same approach, the organization and activities of the Center should also be established in four steps.

1) EDUCATIONAL STAFF DEVELOPMENT:
- The infrastructure of one of the three maritime colleges should be utilized as the Center.
- Most of the personnel working in that college could be utilized to begin the primary functions of the Center.
- It will be necessary to establish a wellorganized Library with enough publications in the fields of education and maritime industry.
- The experience of those Mexicans graduated from the WMU could be utilized to design, structure, and organize most of the courses to be taught.
- External consultants could be utilized to design those courses which cannot be designed internally.
- The months of May and June could be utilized to design training courses based on training needs.
- The months of July and August (summer holidays) could be utilized to implement the courses.

2) MARITIME EDUCATION DEVELOPMENT:
- The Center could be the focus of current knowledge and research on all aspects of maritime education in Mexico.
- Seminars and workshops could be implemented with the advise of I.M.O. not only at the national level but at the international level as well.
- The Center could also work upon the design of booklets, manuals and handouts to be used in each of the lectures or subjects of the curriculum for deck and engineering courses.
- The liaison with external training and educational institutions in order to become the organization's link with other national and international establishments should be made in this Center.
- All these activities should be organized along the school year and with enough time to achieve the different goals.
- The personnel graduated from the WMU should be in charge of that planning.

3) MARITIME INDUSTRY DEVELOPMENT (NATIONAL):
- The personnel required to conduct updating and upgrading courses is available at present. Most of these courses are imparted in the three maritime colleges.
- The centralization of these activities in combination with the implementation of compensation programs (chapter 3, sections 3.5.1 and 3.5.2) will allow the
organization to select the best personnel among the three colleges.

- Furthermore, with the establishment of courses for faculty development (paragraph 1), the personnel should have even better qualifications.

- In addition to the courses being currently conducted, more courses could be implemented to increase the development of the Mexican maritime industry.

- It will be easier for the organization to purchase new equipment because instead of buying the same equipment for the three colleges, it will be necessary to buy only one set.

4) MARITIME INDUSTRY DEVELOPMENT (INTERNATIONAL):

- The organization of courses should be made in a similar way as that established in the WMU, that is, lectures, seminars, field-trips, etc.

- The courses could be shortened from two to one year. At present, several subjects being taught at the WMU are currently studied in most of the maritime colleges in Latin-America.

- The project work should be separated from the regular courses. Students who are commissioned by their colleges or governments to carry out a research project could also attend some of the lectures in which they are interested, or that they need to complete some areas of their research.

- The resident faculty should be selected from graduates of the WMU from Latin American Countries. They should also be appointed by their respective governments.

- Visiting professors should be holding important positions in establishments related to the maritime industry in different Latin American Countries.

- The financing of the Center should be made by all
Latin American Countries and with the aid of the UNDP and the IMO.

- Taking in consideration the standards of living and income per capita in most of the Latin American Countries, the Center could be maintained with an annual budget much smaller than the one needed by the WMU.

4.4.3 INTER-ORGANIZATIONAL VALIDITY

In addition to the considerations made in the last section, there are some other factors that should be taken into account. For instance, the courses which have been mentioned to develop the maritime education and in general the maritime industry in Mexico, should also be integrated with the national system of education.

As described in chapter 2, section 2.1, the system of maritime education in Mexico is incorporated to the Secretariat of Public Education; therefore, it will be necessary to consider the inclusion of personnel of that governmental agency so that they can verify the fulfillment of the national regulations in the newly implemented courses.

Moreover, in the case of a multinational establishment, the problems are not as easy as they might be within the national context. In order to obtain international validity and support, it will be necessary to revert to international organizations such as UNDP, IMO and ROCRAM which is the Operative Network of Cooperation between Maritime Authorities for Latin America (i.e. Red Operativa de Cooperación entre Autoridades Marítimas).

Two considerations can be pointed out with regard to this issue:

1) The support and approval by the governments of Latin
American Countries can be obtained via the representatives of ROCRAM in their respective countries.

2) The support and approval of other international educational institutions (such as the WMU) to the courses should be obtained via the international organizations such as the IMO and UNDP.

4.5 CONCLUSION

The underlying idea which has been emphasized throughout this chapter is that of bringing together the training and development function with the overall plans of the organizational system of maritime education in Mexico. In order to consider training as a sub-system, it is necessary to unify the training objectives, policies and strategies in pursuit of the organization's goals.

A successful training and development function has to be built on teamwork, in which everyone is aware of the goals to be accomplished, and recognizing that each one has a part to play. The whole organization (from top to bottom) should be fully committed to making training policies work.

This is a key factor if the Advanced Educational Maritime Center, suggested herein, is to be truly effective in terms of carrying out its purpose of improving systematically not only the organization's performance but the maritime industry as well.
CHAPTER 5

STRATEGIC EDUCATIONAL PLANNING

The essence of strategic planning is to allocate resources to those areas that have the greatest future potential.

5.1 INTRODUCTION

The objective of this chapter is to propose the basic terms of reference to establish a systematic procedure in the management of maritime colleges within the context of the organizational system of maritime education in Mexico. The steps taken to develop this scheme are based on similar procedures found in the literature available concerning management by objectives, and strategic planning for the private sector.

Strategic educational planning contemplates maritime colleges to be focused as a complete system. Furthermore, direction and allocation of resources can be determined so that weaknesses can be reduced, and at the same time, the greatest potentials of the system, present and future, can...
be enhanced. In addition, the use of strategic planning models to administer maritime colleges in Mexico will help to improve the understanding and quality of strategic thinking at more levels than the system currently in use does.

Figure 5.1 shows a model of the structure and process of systematic organizational strategic planning; at the same time the framework provides a term of reference to illustrate the contents and organization of the present chapter.

5.2 INFORMATION ANALYSIS

When developing and planning future directions, any organization should revert to information analysis as a first step. Strategic analysis is best carried out by the organization's own personnel, if one is to believe the results of the data analysis.

One way to analyse data so that objectives can be assessed as attainable and a strategic plan adopted to achieve them, is by means of the SWOT UP approach. SWOT UP, the acronym of strengths, weaknesses, opportunities and threats of the underlying plan, is a summing up of the factors affecting strategic analysis.

Strengths and weaknesses are organizational or internal characteristics, while opportunities and threats are environmental or external characteristics. Therefore, each organization should identify those elements which are most significant to its improvement, and development and concentrate thought and effort on understanding them.
FIG. 5.1 SYSTEMATIC STRATEGIC PLANNING PROCESS.
5.2.1 ORGANIZATIONAL CHARACTERISTICS

Organizational characteristics have a potential impact on the formulation and implementation of strategies. Strengths represent the essence on which success can be built, whereas weaknesses reveal the areas which need the allocation of resources.

In order to make the appropriate decisions when formulating and implementing strategies, the following internal characteristics should be analysed:

1) policies, structure and relationships,
2) key personnel, their skills, training and attitudes,
3) project team personnel,
4) human resources, their skills, training and attitudes,
5) delegation responsibilities,
6) communication flows,
7) communication systems ( formal/informal ),
8) financial support ( budget ),
9) facilities and equipment,
10) services which are being offered, and
11) areas which need the allocation of resources.

5.2.2 ENVIRONMENTAL CHARACTERISTICS

The second objective of the information analysis system will be to identify and analyse the key trends, and forces in the environment of the organization that will have a profound impact on the strategies to implement. Opportunities should be sought, recognized and grasped as they arise, whereas threats should be acknowledged so that appropriate steps can be taken to deal with them.

Taking in consideration the character of the maritime col-
leges in Mexico, the following external characteristics should be analysed:

1) the international shipping market, its growth, routes, and vessel characteristics,
2) the national shipping market, its growth, routes, and vessel characteristics (type and number),
3) positions/posts being held by graduates,
4) the policies adopted by the government via the General Directorate of Merchant Marine in relation to maritime education,
5) the policies adopted by the shipping companies in relation to maritime education,
6) the possible future trends in the shipping industry (technology, systems and procedures), and
7) the maritime educational schemes being followed in other maritime colleges from industrialized countries, and their possible future trends.

5.3 DEVELOPMENT OF STRATEGIES

On the basis of the strategic analysis of information, the formulation of strategies can be done. Fundamentally there are two different ways to formulate strategic plans for the future:

a) they are conceived as the entrepreneurial insight of one individual (intuitive planning), or
b) they are developed on the basis of a set of procedures (formal systematic planning).

Even though strategic planning is of commanding significance, it is worth mentioning that unless managers at all levels inject their judgements and intuition into the plan-
ning process, this cannot be effective.

Strategic planning can be defined in five different ways:

a) it looks at the chain of cause and effect consequences over time of an intended decision,
b) it also looks at the alternative courses of action that are open in the future,
c) it is a process that begins with the setting of aims, objectives, and policies to further define strategies, and develop detailed plans to achieve the ends sought,
d) it is an attitude that needs dedication to plan constantly and systematically as an integral part of the organization and its personnel, and
e) it is the systematic link between the three major types of plans: long-range plans, medium-range programs, and short-range budgets and operating plans.

5.3.1 MASTER STRATEGIES

In section 5.2, the major environmental (internal and external) concerns for maritime educational establishments were identified; however, the identification of environmental interactions is only a first step in the strategic planning process.

The second step is the development of strategies to implement. Master strategies are defined as the aims, objectives, and policies sought by the organization.

Taking into account the strategic analysis (SWOT UP), the formulation of master strategies is a logical and rational process, with the following basic steps:

1) ESTABLISHING STRATEGIC OBJECTIVES:
They are set at an appropriate level of generality, based on the kind of services in which the educational institution is engaged, and deciding on the services in which the organization or department should engage. An objective should be:

- suitable,
- understandable,
- feasible,
- acceptable,
- flexible,
- motivating,
- measurable over time,
- linked to basic purposes, and
- based on people participation.

2) SETTING SUB-OBJECTIVES:
Sub-objectives are established in order to achieve targets shorter in time range, or narrower in scope than the objectives. Sub-objectives are designed specifically in order to make operational plans for implementing strategies. Objectives and sub-objectives are closely related, and, depending upon where one objective starts, these objectives might become the sub-objective of each other.

3) DEVELOPING POLICIES:
Policies are developed and established in order to guide the performance of all major activities when implementing master strategies, and in accordance with the organization philosophy. The widening gap between what is planned and what actually takes place is rather a common feature which indeed points to a failure of development policies.
There are basically two kinds of policies:
the policies concerned with the organization's mission, purpose, thrust, and ways of doing business. They are broad, and usually they are identified as synonymous to strategies.

- the policies concerned with the actual implementation of strategies, namely program policies, are those which phase into procedures, standard operating plans, and rules.

5.3.2 TACTICAL STRATEGIES

Once the organization has developed overall objectives, sub-objectives, and policies, there is the need to develop tactical strategies. Without an organized planning program, it is more difficult for department managers to make decisions in a direction determined by top management.

In order to develop an integrated planning framework so that master strategies can pay off positively, the following points should be taken into account:

a) characteristics of the plan objectives/sub-objectives;
b) conflicts between objectives/sub-objectives,
c) insufficiency of the data-base for plan design, control/monitoring, and evaluations,
d) lack of qualified personnel to design and carry out plans,
e) lack of communication between planning department, day-to-day decision-makers and those effected by those decisions, and
f) lack of organizational will to implement the plan.
Tactical strategies are all those moves made within the framework provided by master strategies. The following are some of the basic terms of reference to develop tactical strategies:

1) PLANNING THE ORGANIZATIONAL STRUCTURE:
The development of organizational plans helps people to pull together in performing activities in accordance with strategy, philosophy, and policies. Key personnel such as decision-makers and project teams are appointed to fill the positions provided for in the organizational plan.

2) PLANNING THE STRATEGY:
The development of ideas, schedules, and plans to achieve objectives/sub-objectives successfully is made in this context. Key considerations are made to evaluate the SWOT UP, and their possible trade-offs as well.

3) ESTABLISHING PROCEDURES:
These procedures are meant to determine, and prescribe how all important and recurrent activities should be performed.

4) SETTING STANDARDS:
Performance standards in addition to schedules are established to measure the different stages of implementation of long-term objectives so that they can be accomplished successfully.

5) OPERATIONAL PROGRAMS:
These programs are developed govern the different activities which are implied by the master strategies, as well as the use of resources (capital, facilities, and
personnel), in order to carry them out in accordance with established policies, strategies, procedures, and standards.

6) CONTROL INFORMATION:
Tactical strategies comprise supplying facts and figures too, so that people in the organization can follow the strategy, policies, procedures, and programs. In addition, providing control information can help to measure personnel's performance against established plans, programs, and standards.

7) EVALUATION PROCEDURES:
Evaluation procedures are useful in determining whether or not the master strategy has produced the desired results. At every stage of the operational programs there should be a continual process of monitoring and feedback from one stage to another. Should the results not be satisfactory, amendments to the original plan can be made, or else options can be considered.

5.3.3 PLANNING MANUALS
Planning manuals provide the basic guidelines for the proper implementation of strategies. They comprise the sequence of steps described for both master and tactical strategies (section 5.3.1 and 5.3.2).
Planning manuals are written when there is reasonable agreement and understanding among top management and key personnel (i.e. project team, department managers, etc.).

Planning manuals vary in size and content from one organization to another. Nevertheless, the author has adapted from
the literature available, the following format which could be used within the context of maritime education in Mexico:

a) INTRODUCTION:
- Introductory statement by the Secretary-General of the Trusteeship about the main purposes of the present year.

b) BACKGROUND INFORMATION:
- Organization's mission statements,
- organization's philosophy about strategic planning,
- organizational charts,
- function and role of the different departments in the organization,
- major issues of concern to the Trusteeship,
- evaluation of the maritime environment,
- changes from last year,
- planning assumptions.

c) MASTER STRATEGIES:
- Summary of total plan (description/diagram),
- principal objectives (schedule),
- sub-objectives (schedule),
- policies.

d) TACTICAL STRATEGIES:
- Organizational structure (project team, key personnel),
- description of procedures (data flow),
- description of standards,
- operational programs,
- control systems,
- evaluation procedures.
e) Glossary of terms.

Due to the fact that strategic planning calls for essential data about such matters as objectives, strategies, and tactical programs, as described previously, that information should be handled in a very special way, as appropriate and as desired by top management.

5.4 STRATEGIES IMPLEMENTATION

The next stage in the process of strategic planning is the translation of strategic plans into current decisions. This process can only be started when the following actions have been completed:

1) Planning manuals are readily available for all persons involved in the strategy planning, namely top management, the project team, and key personnel such as: heads of department, and decision-makers.

2) Long-range planning objectives, medium-range functional programs and short-range tactical plans, as comprised in the planning manuals, as well as the key tasks and sequences of steps to be performed to implement plans are totally clear to and understood by all persons referred to above.

3) Those responsible for specific tasks are identified, and formally briefed on what they are supposed to do, and that these personnel have a thorough understanding of the job.

4) There is assurance that facilities, capital and human
resources will be available when needed to facilitate implementation of plans.

5) Appropriate systems and personnel to coordinate efforts and guide individual activity are available so that individual performance is in line with plans.

6) There is confidence in the entire information system of the organization so that top management and heads of departments have access to facts and figures, when desired, in order to evaluate the fulfillment of programs.

7) There is sufficient confidence in the control techniques to ensure that the standards set for each specific task can be compared with the actual performance, and consequently corrective actions can be taken when this performance differs from plans.

5.5 EVALUATION OF STRATEGIES

Throughout the series of activities comprised by the strategic planning process, there must be a continual process of feedback and monitoring from one stage to another. When the strategic analysis (SWOT UP) is elaborated, when the strategies (master and tactical) are developed, and when those strategies (long, medium, and short-range) are implemented, there must be an examination of the feasibility of these different plans and programs and, consequently, a means of evaluating them.

When a strategy is adopted and implemented, there should be continual feedback on the effectiveness of the programs so that decisions can be taken to amend the strategy, be they
partial or radical.
When evaluating performance of implemented plans, the adopted control systems come to play a vital role. The control system seeks to ensure that performance conforms to plans and programs. The process involves three basic steps:
- setting standards,
- evaluation of performance in light of standards, and
- correcting deviations from standards.

The establishment of standards for performance should always be considered when formulating tactical strategies (section 5.3.2); not only the different stages of development of the programs against the schedules, but the allocation of resources (capital and personnel) should be considered as well.

The evaluation of performance against standards relies heavily upon the king of reporting and information system utilized by the organization (section 5.3.2). The information may be collected through computer, or reports, or through both of them, to be later on, measured and compared with standards in the meetings.

Before taking corrective action, top management should establish the parameters or warning signals in which such adjustments should be made. When it is necessary to correct deviations from standards, managers can correct them by reorganizing team groups, by retraining present workers, by setting new standards, by better motivating employees, or even by revision of strategies, plans and programs. Reaching this last stage implies that the entire process of strategic planning should be contemplated all over again.
5.6 CONCLUSIONS

Educational establishments can be studied from different perspectives: taking in consideration their political, economic or social functions. The focus adopted in the present chapter is that of contemplating educational institutions as a whole, as complex units in which different groups of elements interact.

The management of human resources was considered in chapter three, whereas the training and development function was contemplated in chapter four. In both of the chapters, the importance of the human element was analysed and emphasized. Moreover, different schemes were presented in order to obtain a stable, and a highly qualified and motivated personnel.

It is only within the context of strategic planning that the above-mentioned schemes can be developed and implemented. Nevertheless, the organizational system of maritime education in Mexico will not benefit from its personnel unless they are linked to the overall functioning of the organization by means of effective strategic planning programs. Therefore, the processes described in this chapter should be included in the day-to-day routines of the maritime colleges so that more personnel are involved in the different stages of the educational strategic planning.

To summarize, the following can be specified:
1) The aims, goals, and objectives of the entire organization must be in satisfactory harmony with the relevant needs of both the majority of its staff members and of the shipping companies served by it.
2) The specific tasks considered in the planning programs should be established in such a way that the personnel assigned to perform them are highly motivated and committed to achieve them.

3) The methods and procedures adopted to achieve the agreed-upon objectives should be developed in such a way that staff members are highly motivated and committed to use them to their maximum potential.

4) Before the strategic plans and programs are translated into specific current decisions, planning manuals containing descriptions of strategies, procedures, information systems, operational programs, performance standards, control systems, and evaluation procedures should be readily available.

5) Finally, the personnel working within the organizational system of maritime education in Mexico should feel that the compensation programs and the reward systems used by the organization yield them equitable pay-off for their efforts and contributions.
The consistency of maritime colleges to adapt their strategies, structures, and policies to new circumstances within the maritime environment is the key to their long-term success.

6.1 INTRODUCTION

The objective of this chapter is to analyse the influences affecting the performance of seafarers within the maritime environment, and consequently to determine the possible ways of action to adapt the organizational system of maritime education in Mexico by means of improving the quality and efficiency of both the undergraduate program and the upgrading courses.

Basically, when a major marine casualty occurs experts all around the world begin to study and analyse the causes involved in such a disaster. Most of the time human error appears to be the cause, and consequently discussions focusing on the avoidance of future marine casualties begin.
Some experts suggest the introduction of the teamwork approach in order to minimize marine casualties, while some others support the practical training approach against what it is called the "theoretical clap-trap" of the training schemes, and so on.

Nevertheless, the approach taken by the author to analyse mariner performance in order to develop better training programs, is that of the ergonomics' point of view. With this approach, optimizing the safety and efficiency of the vessel and the seafarer are not only questions of providing better training and equipment, but of integrating those elements in what is called the man/machine system.

6.2 MARITIME EDUCATION AND ITS ENVIRONMENT

The primary purpose of any maritime educational and training scheme is to ensure that vessels are operated safely and efficiently.

However, the international nature of the maritime industry has resulted in many different interpretations of the above mentioned statement.

Among the different parties involved in the shipping industry, there are national governments, maritime authorities, educational systems, shipowners, mariners' unions, international organizations, classification societies, shipyards, manufacturers, and so on.

At different stages in the undergraduate program or in the upgrading courses, the influence of each one of those organizations appears sooner or later and to a certain extent.
Notwithstanding the fact that maritime colleges deal with a number of influences from the maritime environment, those influences can be grouped into three main sectors, namely:

1) society,
2) maritime administration, and
3) shipping companies.

Figure 6.1 shows these three elements and their relationship to maritime education.

6.2.1 THE SOCIETY

It is easy to understand the influences exerted by the society on maritime education and the reasons for these influences.

By means of the learning process a person obtains the knowledge, skills and attitudes accumulated for centuries by earlier generations.

It is within the framework of the society that the transfer of knowledge and experience is made possible. Civilization and culture are inherent to society, and it is the society which assumes responsibility for preserving and transmitting this knowledge.

Maritime colleges are part of the society; they were established bearing in mind the thoughts expressed above. And it is the status given by the society to these institutions which determines the initial behaviour and desire of students to become part of them.

One of the social functions of maritime colleges is to transfer knowledge, skills and attitudes to the students in order
FIG. 6.1 MARITIME EDUCATION: ITS ENVIRONMENT AND RELATIONSHIPS.
to transform them into officers, and eventually into Masters and Chief Engineers.

Another aspect considered as a part of the social functions of educational establishments is that of contributing to satisfy the needs of the students as human beings (section 3.5) such as the need for acceptance and recognition by the society in which they live.

As it was established in chapter two (section 2.1), the organizational system of maritime education in Mexico is an integral part of the Secretariat of Public Education (S.E.P.). Moreover, since 1956, students finishing the undergraduate program are awarded a Bachelor of Science degree, satisfying with this their own social needs, and the social needs of their families as well.

In addition, the maritime colleges comply with a socio-political function which is to educate and train students in order to improve their capabilities, and as a consequence to improve the educational and cultural level in the country.

6.2.2 THE MARITIME ADMINISTRATION

Being the maritime administration ultimately responsible for the safe navigation of ships and the protection of the marine environment, it is obvious that this dependency exerts a lot of influences on the development of and modifications to undergraduate programs in the maritime colleges.

Furthermore, with the adoption and coming into force of the STCW-78 convention, and Mexico being a member country of the I.M.O., The General Directorate of the Merchant Marine (i.e. D.G.M.M.) has been actively working on the compliance with
this convention by the organizational system of maritime edu-
cation in Mexico (chapter 2, section 2.2).

In addition to the requirements of maritime education and
training, the standards for certification, and up-grading
courses, and a set of recommendations which expand upon the
regulations themselves by giving more details, are estab-
lished in the I.M.O. STCW-78 convention.

Moreover, the influences of the maritime administrations on
the maritime colleges are not only limited to international
requirements; they extend to national requirements and regu-
lations as well.

The close relationship between the General Directorate of the
Merchant Marine and the organizational system of maritime
education in Mexico has allowed the maritime colleges to con-
sider, and include each one of the new national and interna-
tional requirements into the educational and training schemes
for seafarers step by step since 1979.

As a result of this cooperation with the maritime administra-
tion, the undergraduate programs at the maritime colleges ex-
ceed international standards as described by the STCW-78 con-
vention, as it was confirmed and established by the I.M.O.
consultants E. Moat, G.R. Hodge, and E. Cruz-Iturzaeta, dur-
ing their visit to Mexico from the 3rd to the 14th of Septem-
ber 1984, and in their report of the 5th December 1984.

6.2.3 THE SHIPPING COMPANIES

The third sector influencing maritime education is that of
the shipping companies; and those companies being the custom-
ers to the services provided by the maritime colleges, it is logical to expect influences from them.

Basically the pressures posed to maritime colleges by the shipping companies are those of developing cost-effective schemes of education and training to supply them with competent personnel in a short-time to man their ships.

Another influence made by shipping companies is related to the high turnover rates (attrition) of seafarers. In this context, the shipping companies argue that the academic/theoretical subjects included in the undergraduate programs allow the seafarer to leave the sea and find shore-based jobs within the maritime industry, increasing the current turnover rates aboard ships.

In addition, the introduction of automatization and computers aboard has made the shipping companies, that are seeking to reduce personnel on board, and consequently the manning cost of the vessels, demand for new educational schemes.

Having in mind those demands, the Federal Government acquired a brand new, specially designed and fully equipped training ship in 1981 (chapter 2, section 2.4). The incorporation of the T/S "Nauticas México" to the organizational system of maritime education in Mexico made possible the development and implementation of an educational scheme with the following characteristics:

1) The new scheme is shorter in time than the previous one.

2) Because the training ship is operated on a commercial basis, students receive instructional training directly on the job, enhancing with this their understanding of
3) The high sophistication of the vessel (navigational electronic aids, engine room, and cargo gear) allows students to enhance their skills in the operation of equipment currently carried in modern vessels.

4) In addition, the new scheme of education and training complies with the requirements of the society (section 6.2.1), and with the requirements of the maritime administration, namely the General Directorate of the Merchant Marine (section 6.2.2).

In relation to the turnover rates, a decision was taken in the organizational system of maritime education in Mexico to withhold the issuance of Bachelor of Science degree to graduates until they comply with the requirements of certification for Masters and Chief Engineers of sea-going vessels. With this measure, the new graduates are forced to remain at sea for more years.

On the other hand, in order to maintain up-to-date undergraduate programs and up-grading courses, the General-Director of the Trusteeship gave the pertinent orders for yearly evaluation of and, if necessary, modification of those schemes.

Finally, the new educational schemes (bi-valent officer or maritime officer) are not considered suitable in Mexico at the present time for the simple reason that the average age of the Mexican fleet is about ten years.

6.3 MAN/MACHINE SYSTEM
The organizational system of maritime education in Mexico has developed and undergraduate program for officers which takes into account the different needs of the three main sectors influencing the maritime industry, as explained earlier. However, marine casualties within the national context are still present.

Therefore, in order to provide constructive criticism about the quality and efficiency of the undergraduate program currently being used, it is necessary to analyse deeper the behaviour of officers aboard, and its implications on marine casualties. Figure 6.2 is utilized in this context to show the sequence of this analysis.

Marine casualties may be considered as the result of the relationship between the expected performance of the man/machine system, and its inability to achieve this performance.

In order to identify the mechanisms which generate marine casualties, it is essential to reappraise both the job of running a ship (work aboard), as well as the sociological perspectives found there (life aboard).

6.3.1 WORK ABOARD

The broad task descriptions which come under the category of the term "work aboard" impose some apparent limitations to this reappraisal.

Therefore, in order to define more specifically this term, the author has focused this analysis on the work carried out by a bridge officer during a sea passage (watch duties).

The following five groups of bridge tasks are distinguished:
FIG. 6.2. HUMAN PERFORMANCE ABOARD: CAUSE RELATIONSHIP OF THE MAN/MACHINE INTERFACE.
1) navigation (position fixing, collision avoidance),
2) steering (course keeping or altering),
3) monitoring cargo condition (smoke detector),
4) monitoring vessel's condition (pitching, rolling), and
5) communication (inter-com, VHF).

The analysis of the work carried out by the bridge officer can be made by considering three aspects:
1) working environment,
2) ambient environment, and
3) social environment.

6.3.1.1 WORKING ENVIRONMENT

The different variables contained by the working environment which affect the performance of the officer, are, among others:
1) job interactions,
2) work space,
3) working equipment, and
4) working procedures.

It is important that these variables should be analysed and evaluated as a first step in the design of any training program.

For example, if the vessel is sailing in the middle of the ocean, the tasks distinguished in section 6.3.1 are reduced to low levels; as a result, the watchkeeping officer is condemned to perform routine tasks, mainly monitoring navigational aids, during the four-hour period watch.

On the other hand, if the vessel is navigating through congested waters, the same tasks will impose a very heavy work-
load on the officer during the watch.

In this context, the following observations can be made:

1) The periods of inactivity during the watch on long ocean-passages reduce the skills of the officer. He is likely to react slowly when needed, and these periods of boredom affect his attitudes towards the job.

2) Bridge lay-out and accuracy of navigational aids affect the performance of the officer. The readiness and exactness of information is essential to meet safety standards of navigational performance, specially in congested areas.

Even though the example presented above is focused on the work carried out by the bridge officer, the two different scenarios change radically the needs in skills required by the watchkeeping officer so that he can perform his duties safely.

Bridge procedures, being part of the working environment, should be analysed thoroughly so that the factors negatively influencing the officer's performance can be identified and evaluated.

Once formulated, reliable bridge procedure manuals can be utilized as:

1) directives for the watchkeeping officer on how to conduct a safe navigational watch, taking into account the different tasks interactions during the different stages of the voyage.

2) a reference in the design of bridge lay-out, and in the
design of navigational equipment so that the information required is available in the right place and at the right moment.

3) a means of evaluation of training syllabi, so that maritime colleges can modify their educational and training schemes.

4) a term of reference in marine casualty investigation in order to evaluate bridge officer behaviour.

6.3.1.2 AMBIENT ENVIRONMENT

Ambient environment is a term related to the physical surroundings which might affect the performance of the officer. In the particular case of bridge work, several influences can be observed regarding ambient environment:

1) PERCEPTION:
Generally arcs of horizon are less than 180°. Windows are small, and additional obstructions such as masts, derricks, and cranes reduce even more the available horizon.

2) EXECUTION:
The design of navigational aids is confusing and inconsistent. The different types of panels, the positioning and shape of displays and control knobs, the different symbols and labelling, and inadequate lighting levels of the equipment being used aboard, constrain the execution of actions.

Some other influences on performance by ambient environment
are: extreme temperatures, unsuitable ventilation, high noise levels, vibrations, slippery decks, etc.

Even though these influences do not affect the performance of the bridge officer, they are found in the other jobs aboard, consequently they should also be considered.

6.3.1.3 SOCIAL ENVIRONMENT

Social environment includes the influences exerted by the people surrounding a seafarer in his job. Features as communications, responsibilities, information flows, and contact with other people also present problems.

Basically, the persons who are in contact with the bridge officer are: helmsmen, look-outs, masters, other bridge officers, engine-room officers and pilots.

Not so much has been studied about the sociological perspectives of the work aboard. The influence of the social environment on the performance of the bridge officer depends upon the following:

1) PERSONALITY:
   The attitudes adopted by the watchkeeping officer will influence his performance. Some variables which affect his attitudes are: character, experience, confidence, adaptability, and motivation.

2) JOB DESCRIPTIONS:
   By providing clear job descriptions (responsibilities, lines of communications, information flows), and bridge procedure manuals, the bridge officer is likely to interact better with the people who are in contact with him.
3) SEAFARING CULTURE:

The pattern of culture represents the sum total of behaviour, attitudes and values within the seafaring community. The hierarchy of authority, and the class structure (officers, ratings) aboard have a strong influence on the efficiency of the officer. As a result, the watchkeeper is likely to evaluate situations, and to take decisions and actions by himself.

6.3.2 LIFE ABOARD

The routine system of watchkeeping aboard governs not only times of work but also all the aspects of life aboard such as meals, relaxation and leisure time, and possible social relationships and contacts.

Life aboard is a 24-hour-a-day society in which all its aspects are lived out within the narrow physical confines of the vessel.

Anecdotally, some vessels are described as "HAPPY", while others are not. The factors contributing to these situations are not easy to explain; but some of them depend upon the type of ship, the route in which she is engaged, company's policies (salaries, leaves, etc.), her master, and so on.

6.3.2.1 PERMEABILITY ABOARD

The ship's crew constitutes a selected group of individuals, the majority of whom are unknown to each other. When the vessel leaves port, these individuals are cut off from the wider society ashore, and are encapsulated by their shipboard environment.
Permeability is the term used, in this context, to evaluate the tensions experienced by the ship's crew when the ship is at sea.

Permeability is an indicator of the influence exerted upon the seafaring community by those existing outside; the higher the level of permeability, the greater the similarity of the vessel's community to the external society.

The different levels of permeability depend upon the following factors:

- length of sea-passage (e.g.: 1 hour, 4 days, 2 weeks),
- stay in port (e.g.: 2 hours, 10 hours, 3 days),
- dock terminal position (e.g.: within the town, 5 miles away),
- type of ship (e.g.: VLCC, dry cargo, passenger liner),
- itinerary (e.g.: liner, tramp, cross-trade).

As a result, VLCC and LPG/LNG carriers are characterized by their low levels of permeability. Their long sea passages together with their short stays in port afford little opportunity for social interaction between crew and local populations. Moreover, tanker terminals are usually situated in remote places or even in the deep sea due to safety requirements.

On the other hand, ferry-boats and passenger liners are characterized by their high levels of permeability; and their social systems are, in many respects, a small part of the external society.

6.3.2.2 DEPRIVATIONS ABOARD

The different levels of permeability might influence the seafarer's performance to a certain extent due to the depriva-
tions that are brought upon them. Furthermore, deprivations can also be caused by the nature of the ship herself, and in particular to the division of labour and hierarchical structure. The following are some specific deprivations that are found aboard:

1) RELATIONSHIPS:
Relationships of seafarers are restricted to the crew only. The social distance between officers and ratings, their separate mess rooms, and accommodation areas further reduces the possibilities of interaction.

2) SOCIETY:
The social structure of the ship does not have the potential richness of relations of the larger social environment available to the shore worker. In this context, the seafarer is lacking the stimuli provided by family relations, wives, children and friends. Family circumstances cannot be influenced due to the lack of information and communication facilities besides the physical barriers. In addition, the ship's environment cuts off many other social contacts and the possibility of taking part in many shore activities. It also lessens the opportunity of maintaining meaningful social relations. Social stimuli in the form of newspapers and television will also be restricted on the ship.

3) BLOCK CARRIER PERSPECTIVE:
In spite of the skills, experience, and capabilities obtained aboard by the seafarers, they see themselves remaining at sea until they retire. The short leaves, short stays in port, and the natural barrier imposed by the
sea, constrains the possibilities of career development. Block career perspective is the result of the absence of a policy of systematic resettlement of seafarers in order to make good use of the potential valuable source of skilled manpower for shore-based industries and services.

6.3.3 HUMAN PERFORMANCE

A seafarer is a person on board a ship doing a demanding job which is occasionally both difficult and dangerous. So far the author has described in the last sections some of the consequences of being a seafarer, that is, his job (navigating officer, for example), and his life. It was also established that different variables influence the performance of the seafarer on board ships. However, for reasons not to be considered in this paper, there are individuals who seek out environments of low permeability and obtain satisfaction from living and working there. The fact is that the different processes and influences being described in this chapter are common to all ranks and departments aboard, and, in whatever capacity and individual goes to sea, he is likely to experience them.

Traditionally, the degree of the impact of maritime education and training on the performance of seafarers has been a question of major concern among the three main elements involved in shipping, namely society, maritime administration, and shipping companies. The assumption is that educational and training programs are not effectively designed, and, as a consequence, performance aboard cannot to improved.

The author's belief, in this context, is that the maritime
educational and training schemes in Mexico are satisfactory, and that the sociological and working conditions prevailing on board do hamper the effective use of knowledge and skills learned at the maritime colleges.

Maritime casualties cannot be avoided solely on the basis of the modifications made to the undergraduate programs. In the absence of favourable environmental conditions, all that has been learned at the maritime colleges in fact often cannot be applied in practice. Moreover, this situation might be dangerous because it frustrates the individual, when he gets no opportunity to use his skills. His confidence in any further training course (i.e. up-grading courses) is therefore considerably diminished.

Before evaluations are made about training schemes, seafaring life should be studied and analysed so that sources of pressures affecting seafarer performance can be acknowledged in order to deal with them. The more closely seafaring life is studied, the greater the understanding of cause relationships of marine casualties will be.

6.4 MARINE CASUALTIES

Marine casualties are considered as accidents involving the loss of or damage to life, property (ship/cargo), and environment (fisheries/resort places). Generally the most common marine casualties are collisions and groundings.

Furthermore, statistics show that in about 80% of these accidents, the cause is stated to be "HUMAN ERROR", that is, caused by the ship's crew.
However, the author's point of view is that all marine accidents are caused by humans, and that a thorough investigation should be made in this field so that marine casualties are reduced by means of:

1) creating a working climate in which seafarers are motivated to work with pleasure (Q.W.L.= quality of work life),
2) supplying the seafarers with aids to extend their own skills, and consequently ensuring the safety of their lives, of the ship and cargo, and of the marine environment, and
3) on the basis of above, modifying the educational and training programs to achieve more efficient and economic operations on board.

The following is a basic description of cause relationships of marine casualties:

1) TECHNICAL FAILURE:
The main reasons for a technical failure to happen are:
- Quality of equipment (design and components). The parties involved in designing and manufacturing marine equipment are: classification societies and maritime administrations (setting of standards), and manufacturers (materials, parts, assembling).
- Maintenance procedures. The parties involved in maintenance are: the ship personnel (knowledge, skills, and procedures), and the shipping companies (quality of equipment, availability of tools and personnel, and tasks' allocation by means of job descriptions).

2) NEGLIGENCE:
The main causes of negligence or lack of responsibility

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aboard are:

- social factors.- The lack of stimuli provided by family and society (section 6.3.3) are enough reason to create a feeling of uneasiness and apathy among the seafarers which will subsequently affect their performance.

- motivation.- The provision of incentives (salaries, leaves), and of a reasonable working environment (section 6.3.1.1), are factors that also affect the morale of the seafarer, and as a consequence, his attitudes towards the job.

3) IMPROPER OPERATION:

The main reasons for improper operation of equipment aboard are:

- ergonomics.- The skills of seafarers are affected by the poor design of ships (section 6.3.1). The parties involved in the design of ships are: maritime administrations and classification societies (setting of standards), shipyards (design, construction), and shipping companies (acceptance of designs when ordering ships).

- physiological factors.- Factors such as age, fatigue, fitness, food, inadequate temperature and noise levels, and work loads, impose limitations to control working activities.

- experience.- The parties involved in providing the necessary means of achieving the required experience to seafarers, are: maritime colleges (transfer of knowledge and skills), maritime administrations (sea service control), and shipping companies (provision of instructions, operation manuals and job specifications).

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4) FAULTY DECISION:

The main causes when taking faulty decisions are:

- Information procedures.- Decisions should not be taken on the assumption of a scanty of information. However, in emergency cases, decisions are taken relying on available information. The availability of suitable information depends upon: ship's personnel (skills), the ship's designer (lay-out of equipment, design of panels and displays), and shipping companies (availability of equipment, accuracy of instruments, provisions of directives and procedures).

- Education/training.- Educational and training schemes are developed and adopted within the maritime colleges. However, all parties concerned (section 6.2) should have to pay attention first and foremost to the maritime environment in order to modify educational and training programs.

- Experience.- As described in paragraph three.

6.5 MARITIME EDUCATION AND ITS IMPROVEMENT

Maritime education can only be improved by analysing the underlying causes behind marine casualties.

In the last section, a basic description of cause relationships of marine casualties was presented. It was also shown in that description that, behind the ultimate decisions taken by masters and officers manning and operating ships, there are a number of persons and organizations with certain involvement in those decisions.

One classic example in this context is the introduction of traffic separation schemes. In the IMO "Collision Statistics
and Analysis of the Causes of Collisions", 26th Session of
the Sub-committe on Safety of Navigation, 1981, it was con­
clu ded that, in some cases, the introduction of traffic sepa­
ration schemes had reduced considerably the proportion of
collisions.
In this case, the introduction of traffic separation schemes
was a approach to the problem from a "seafarer-centered",
rather than the "casualty-centered point of view taken by the
IMO in the formulation of other regulations.
Reduction of real risks and of accidents at sea can also be
achieved by considering the seafaring career from other dif­
ferent angles. The abilities and limitations of the seafarer
should be assessed in relation to the tasks he has to per­
form, to the environment in which he has to work, and to the
kind of life to which he is exposed, in order to modify, e­
ventually, educational and training schemes on these bases.
Therefore, in order to improve maritime education and train­
ing, maritime colleges require the participation of the par­
ties involved in the maritime industry to provide as input
more objective criteria in the modification of educational
programs.

6.5.1 THE ROLE OF MARITIME
ADMINISTRATION

Maritime administrations are in a unique position in the mar­
itime industry to formulate global maritime policies on a na­
tional basis.
Generally, maritime administrations are in direct contact
with their national governments ( i.e. different governmental
agencies ), international organizations ( i.e. IMO, ILO ),
port authorities, classification societies, national shipping
companies, national shipyards, seafarers' unions, and, obvi­ously maritime colleges.

Regarding maritime education, the maritime administration in Mexico (i.e. D.G.M.M.) has given continuous support to the Trusteeship in charge of the maritime colleges, in matters related to the modification of educational and training schemes, and to financial aid support by the Federal Govern­ment to better equip the colleges.

On the other hand, as described in sections 6.3 and 6.4, the performance of seafarers is affected by the environment. Marine casualties are of great concern to all maritime admin­istrations in the world. Therefore, it is essential that the applicable policies are formulated within the context of the General Directoraté of the Merchant Marine to modify pos­itively the seafarer's environment.

The following are some of the research areas in which the in­tervention of the maritime administration is necessary:

1) ERGONOMICS:
Research is already being made in this area by other or­ganizations such as the Institute for Perception TNO, Netherlands, the U.S. Maritime Administration, and Det Norske Veritas. Their results can be utilized as input to expedite Mexican investigations in this field.

2) SOCIOLOGICAL ASPECTS:
Some of the investigations in this area were made by Tav­istock Institute of Human Relations, the Central Labora­tory of Marine Psychology and Sociology in Gdynia, and the University of Wales Institute of Science and Technol­ogy. Some of their findings are presented in this paper.
3) TRAFFIC SEPARATION SCHEMES:
The pertinent investigations to establish traffic separation schemes should be made by the personnel of the D.G.M.M. in order to reduce the number of collisions in the port areas and off-shore exploitation zones.

4) MAIN AND BACK-UP SYSTEMS:
It is necessary that the D.G.M.M. carries out research in the field of marine equipment in order to evaluate their reliability. Knowledge of the reliability of marine equipment will allow the maritime administration to establish regulations setting minimum standards on the installation of main and back-up systems on board national ships in order to enhance the safety of shipboard operations.

5) RESETTLEMENT OF SEAFARERS:
There is a need for a policy of systematic resettlement of seafarers throughout the maritime industry. Any measures taken to improve living conditions aboard (however justified), are unlikely to alter the fact that most men going to sea will want to leave it sooner or later.
In this context, the author's point of view is that the seafaring career should be limited to fifteen years of sea-service, and that the ship-shore bi-valence concept should be introduced to make good use of the potential valuable source of skilled manpower for shore-based jobs in the maritime industry.

6) ADVANCED EDUCATIONAL MARITIME CENTER:
The participation in planning and support by the D.G.M.M. of the advanced educational maritime center, as suggested in chapter 4, section 4.4., is essential.
The establishment of this center will provide the country
with the required education and training to up-date and up-grade systematically the personnel working at the maritime colleges, and in the maritime industry as well.

6.5.2 THE ROLE OF SHIPPING COMPANIES

Maritime education is essentially a part of the overall investment by shipping companies. Unless shipowners make use of the knowledge and skills learned by seafarers at maritime colleges, they will be wasting resources.

In this context, it can be noticed that while students are taught the regulations to prevent collisions at sea in the maritime colleges, shipping company management is putting pressure on their masters and officers so that they do not reduce speed, for instance, in fog conditions when the ship is navigating in congested areas.

Shipping companies play an important role in the improvement of maritime education and training. Firstly, they have the day-to-day experience of the operating constraints, practices and opportunities of merchant ships. Secondly, based on their experience, maritime colleges can obtain objective feedback so that modifications to educational and training schemes can lead to improvements in the performance of seafarers.

Unfortunately, shipping companies instead of using their experience to increase their participation in maritime education, have been encouraging dissatisfaction among seafarers, eventually creating attitudes of uneasiness and apathy in their work.
As a result, evaluations made to undergraduate programs which take into consideration seafarers' performance, are generally based on wrong criteria.

The description of cause relationships of marine casualties, made in section 6.4, shows by itself some of the factors which are not considered by shipping companies to criticize educational and training programs.

Therefore, it is the belief of the author that the participation by shipping companies in the improvement of maritime education should be directed mainly at creating an environment aboard which is far more sensitive and aware of the psychological and sociological needs of the man at sea.

The following are some of the measures which should be taken to reduce dissatisfaction aboard, and eventually to improve performance:

1) WORKING ENVIRONMENT:
   - To increase participation and concern in the design of ships, bridge and engine-room lay-outs, and so on, by introducing principles of ergonomics.
   - To analyse the accuracy and reliability of the equipment and instruments currently being used aboard so that back-up systems can be introduced.
   - To provide personnel with the time and tools required to carry out preventive and corrective maintenance.
   - To encourage ship-shore communication concerning day-to-day operations by introducing the teamwork approach so that seafarers are not condemned solely to the less satisfying role of watching over the ship and the cargo.
   - To carry out job analysis aboard so that job descriptions/specifications can be formulated; thereafter,
they can be used to define responsibilities, procedures, and consequently, to design training schemes.

- On the basis of the above, to formulate procedure manuals and schedules for preventive maintenance of the equipment.

2) SOCIOLOGICAL PERSPECTIVES:

- To establish and respect rosters and predictable shore leaves for the personnel.

- To allow seafarers, if possible, to select vessel and route so that they can enjoy their stay on board. This philosophy can create and encourage formation of working groups aboard and establishment of meaningful social relationships among seafarers.

- To make provisions aboard so that wives can accompany their husbands during one or two trips a year.

- To make provisions aboard so that recreation areas such as a gymnasium, a sauna-bath, and a video-room, are available to all personnel.

- To formulate policies for systematic resettlement of seafarers. In this context, seafarers are motivated to stay with the company because their career perspectives are enhanced. The ship-shore bi-valence concept encourages loyalty to the company and allows the good use of skillful personnel found aboard.

- On the basis of the above, to schedule the participation of ship's personnel in the different up-dating and up-grading courses offered at the maritime colleges so that their transfer to shore-based jobs is satisfactory.

- To examine patterns of initial contact and of adaptation problems associated with the shipboard environment so that they can be analysed and evaluated. These evaluations can lead to improvement of the working and
social environments aboard, and eventually to the re-
duction of the attrition rates.

6.6 CONCLUSION

Generally, when a marine casualty happens, the blame is put
on the last man in the chain of events which has contributed
to the accident. Nevertheless, it has been shown throughout
this chapter that reactions of the seafarer cannot be judged
solely on the basis of what happens at work aboard ships.

Marine casualty investigations overlook several of the causes
leading to an accident; therefore, their findings tend to be
focused on unsatisfactory or inadequate performance. As a re-
sult, maritime educational and training programs are said to
be designed improperly or not efficiently.

It is the author’s belief that the cause relationship of mar-
itime accidents should be analysed deeper in order to reduce
them. The different factors considered in sections 6.3 and
6.4 are but a few of the causes contributing to maritime cas-
ualties.

In this context, the active participation and involvement not
only of maritime colleges, but of maritime administrations,
and shipping companies as well, is necessary. Only by means of thoroughly studying marine casualties can
reliable information be obtained to improve maritime educa-
tional and training programs.

The close co-operation between the Federal Government, the
General Directorate of the Merchant Marine, and the organiza-
tional system of maritime education in Mexico has made possi-
ble the acquisition of the T/S "Náuticas México" which is the most sophisticated vessel in the national merchant fleet. An additional outcome of this co-operation is the participation to date of eight officers of the maritime colleges in courses at the WMU in Malmö, Sweden.

Now what is needed is more active co-operation and participation of the national shipping companies in the improvement of the maritime educational and training programs in Mexico.
SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

It has been recognized that as sophistication advances, as shipping becomes more complex or automated, so the human element in shipping has become not less but more important.....

-H.E. C.P. SRIVASTAVA

7.1 THE HUMAN RESOURCES

In Chapter 3, a systematic and simplified procedure for human resource management to be applied to the maritime educational system of Mexico was provided. The intent of this chapter was also to provide a general background for the subsequent chapters of this paper on the various aspects of personnel management.

In this context, the organizational system of maritime education in Mexico is facing two main problems:

a) obtaining a suitable manpower supply, and
b) maintaining this employee workforce.

The approach suggested by the author in an effort to seek so-
olutions to the above mentioned problems involves:

1) defining by means of job descriptions the characteristics of the jobs carried out in the organization,

2) defining by means of job specifications the characteristics of the people required to perform those jobs,

3) establishing a manpower planning system in order to identify short-range and long-range needs of human resources,

4) considering the above steps as well as the graduates' history records at the maritime colleges, and their professional experience within the maritime industry in order to seek out the best prospects,

5) establishing a more objective selection procedure so that the most suitable applicant is hired,

6) adopting orientation programs in order to help new employees familiarize themselves with the workplace,

7) modifying compensations programs by including individual plans so that employees are oriented toward loyalty, learning, growth, and development,

8) adopting reward systems within the context of the organization in order to motivate people to perform better, and

9) establishing a communication policy so that regular and open interaction among the staff of the different departments and institutions is achieved.

In the different sections of Chapter 3, the author outlined
the main ideas behind each one of the aforementioned steps. Basic checklists/guidelines were also provided to aid in the achievement of possible solutions. It is worth mentioning that no one of those solutions is absolute; on the contrary, each one of them requires top management in Mexico City to establish clearly its attitudes, and policy towards its workforce.

7.2 STAFF DEVELOPMENT

In Chapter 4, a systematic process in the management of training and development of personnel to be used within the context of maritime education in Mexico was proposed. The proposal is intended to make better use of the economic resources of the organization by means of:

a) improved identification of training needs, and
b) improved design of training programs.

These two statements involve a series of steps which can only be implemented by considering training as a Sub-system. Firstly, training needs are acknowledged by means of manpower planning and job analysis (human resource management); secondly, well designed training programs help individuals to perform better, and consequently help the organization by standardizing working practices and procedures (strategic planning).

The approach suggested by the author for bringing together the training and development function in the overall functioning of the maritime educational system in Mexico consist of the following measures:

1) to take advantage of the human resource management system
proposed in chapter 3 in order to indentify training needs, both qualitatively and quantitatively.

2) to formulate the required training policy so that training programs are supported by top management,

3) to design training programs properly so that the learning process is enhanced,

4) to establish a center for educational staff development which is the organization's focus of current knowledge and research on all aspects of maritime education, and

5) to further develop this center so that all the maritime industry can benefit by it.

The ideas behind these proposals is that the effectiveness of undergraduate programs and up-grading courses depends upon:

a) the way in which they are designed, and

b) the abilities of the professors to promote a transfer of learning.

Furthermore, these two statements can be condensed into one due to the fact that lecturers and instructors within the maritime colleges in Mexico are assigned to design and/or modify the programs they have to teach.

Therefore, by focusing only on the training needs of the faculty, the undergraduate programs and up-grading courses could be improved, and eventually graduates from the maritime colleges would be better qualified.
7.3 STRATEGIC EDUCATIONAL PLANNING

In Chapter 5, a scheme based on strategic planning to be applied in the management of maritime colleges in Mexico was proposed. The basic idea was to consider maritime colleges as a unified system which would improve understanding and the quality of strategic thinking at different levels in the organization's structure.

The approach taken by the author to develop such a simplified scheme was the following:

1) to carry out strategic analysis by means of the SWOT UP approach: at this step the characteristics of the organization and those of the environment are evaluated,

2) based on strategic analysis, to develop master strategies; that is, long-range objectives, medium-range functional programs and short-range budgets,

3) to establish tactical strategies, such as organizational structure, schedules, procedures, standards, and evaluation procedures,

4) to formulate planning manuals when there is reasonable agreement and understanding among top management and key personnel,

5) to implement strategies when there is assurance that facilities, capital, and human resources will be available when needed to facilitate implementation of plans, and

6) to evaluate implemented plans against schedules regularly
so that corrective actions can be taken.

Throughout the various sections of Chapter 5, the complete strategic planning process was presented in a very condensed and simplified way. Therefore, paragraphs presented herein above are only the basic ideas of each one of the stages in this process.

Finally, the complete chapter is by itself a recommendation to the organizational system of maritime education in Mexico. The concepts presented there can be applied to the day-to-day routines of the maritime colleges.

7.4 EVALUATING MARITIME EDUCATION

In Chapter 6, the influences affecting the performance of seafarers within the maritime environment was analysed in order to determine ways of action to improve the quality and efficiency of undergraduate programs and up-grading courses as well.

The first stage in this study was to evaluate the influences exerted by the main sectors involved in the maritime industry and the measures taken by the system of maritime education in Mexico to deal with these influences.

The second stage of this study was to analyse the behaviour of seafarers aboard, and its implications on marine casualties. In this context, two main elements were studied: work aboard and life aboard.

The study revealed that even though education and training are key factors in evaluating human performance, seafarers
are affected by many more influences than workers ashore, namely sociological influences.

On the other hand, evaluation made of marine casualties has revealed that in addition to the sociological influences found aboard ships, the seafarer is unable to perform properly due to the poor design of ships, the quality of the equipment, and to the lack of provision for procedure manuals, and job descriptions/specifications.

The recommendations made by the author are basically directed to improving the working conditions, and the sociological perspectives prevailing aboard ships nowadays. Only by means of:

a) creating a working climate in which seafarers are motivated to work with pleasure, and

b) supplying the seafarers with aids to extend their own skills, and abilities.

can undergraduate programs be modified to achieve the safest, most efficient and most economic operation of ships which the nature of the human being permits.
CHAPTER 2


CHAPTER 3


2) Block, Alberto et al. DESARROLLO DE CAPACIDADES ADMINIS-
CHAPTER 4


CHAPTER 5


CHAPTER 6


5) THE FIRST INTERNATIONAL BRIDGE DESIGN AND OPERATIONS FO-