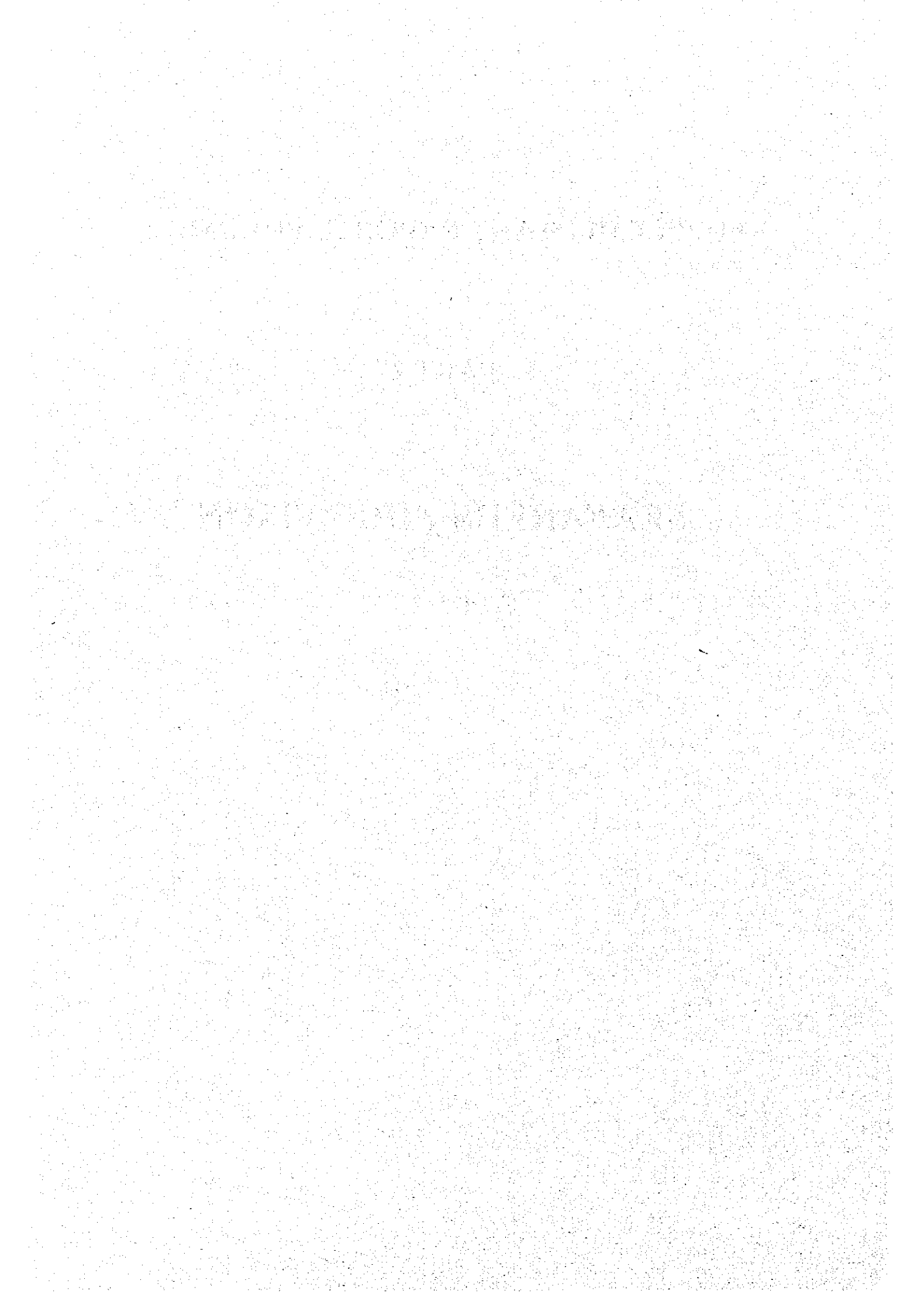


SUPPLEMENTARY REPORTS VOLUME 2

PART 2

SEAFARERS EDUCATION



PART 2 SEAFARERS EDUCATION

Chapter 1 Present Condition of Seafarers Education in Vietnam

1.1 General Education and Seafarers Education in Vietnam

(a) General Education in Vietnam

The government of Vietnam has adopted an important policy in developing its human resources "The Human Resource Strategy" (Resolution of 7th Congress of Vietnam Communist Party), and has given priority to the State's Plan of "Upgrading the Quality of Higher Education to Meet the Demand of Country's Industrialization and Modernization 1996-2000".

In April 1991, the National Assembly of the Socialist Republic of Vietnam passed the Law of Universal Primary Education, which is the first law on Education in Vietnam. According to the New Constitution (1992), a realistic and efficient education improvement through a well-coordinated education development strategy is given priority. The new educational system in Vietnam was introduced (Figure 1.1.1) consisting of 12 years. The primary education for Vietnamese starts at the age of 6 years old. In general, Vietnamese have a high standard of education, with a literacy rate of 93 % for male and 84% for female. The number of schools and students in Vietnam are shown in Tables 1.1.1 and 1.1.2.

Table 1.1.1 NUMBER OF SCHOOLS
(1992-1993)

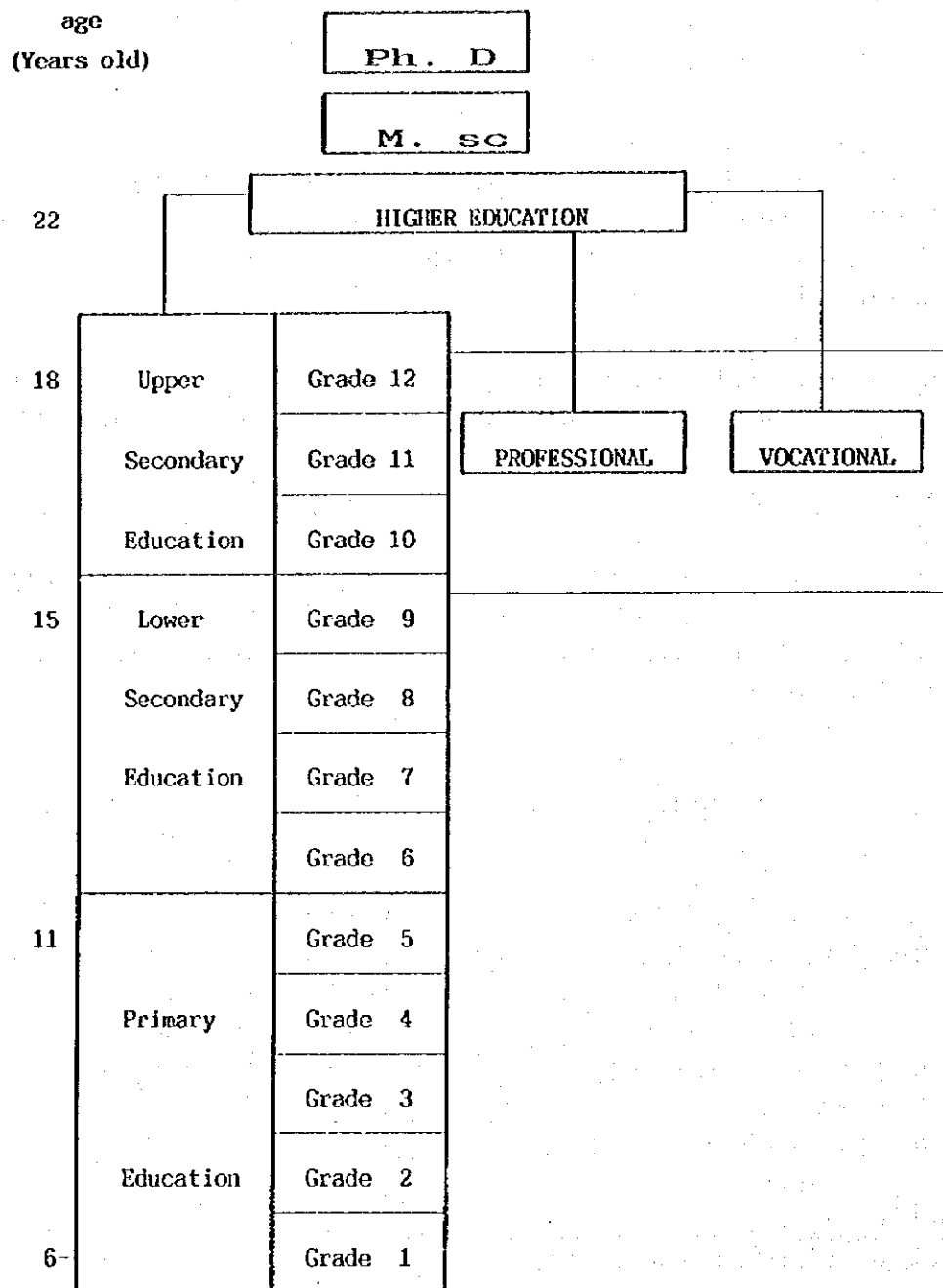
Primary School(Grade 1-5)	8,743
Basic School (Grade 1-9)	4,434
Lower Secondary School (Grade 6-9)	3,984
Secondary School (6-12)	436
Upper Secondary School (Grade 9-12)	778
Vocational School	242
Professional School	262
Higher Education	105
(University)	(63)

Table 1.1.2 NUMBER OF STUDENTS
(1992-1993)

Primary	9,476,441
Lower Secondary	2,813,992
Upper Secondary	576,732
Vocational Education	80,000
Professional Education	98,710
Higher Education	94,575

Source: Ministry of Education and Training, S.R. Vietnam

Figure 1.1.1
EDUCATION SYSTEM IN VIETNAM



(b) Seafarers Education

1) Seafarers Education System

The National Maritime Education System in Vietnam has 2 main structures such as university education and vocational/technical education systems, which are presented in Table 1.1.3.

Table 1.1.3
THE NATIONAL MARITIME EDUCATION SYSTEM IN VIETNAM

Type	Number of Schools	Number of Students	School Year
1. Institution	0	-	-
2. Rating School	2	1,100	1.5/3
3. University	1	5,000	5/3

2) Administration

Schools for general education and most universities, vocational schools and professional schools are under the jurisdiction of the Ministry of Education and Training. However, seafarers educational schools are operated by the Ministry of Transport (MOT) which presently supervises various transport-related agencies such as Vietnam National Maritime Bureau (VINAMARINE) and Vietnam Maritime University (VIMARU). Refer to Figure 1-1-2, Organization Chart of Ministry of Transport.

The largest maritime education institutions is Vietnam Maritime University (VIMARU) which is under the direct control of MOT. It is a specialized university that offers higher education and training not only to maritime officers and engineers but to all fields of technical specialization related to maritime and shipping industries.

There are 7 departments that offer 5 years and 3 years of educational training. Further, there is a Maritime Training Center within the university for the upgrading of officers and engineers.

Vietnam National Maritime Bureau (VINAMARINE) is responsible for all aspects of shipping and coastal transport and concentrates on maritime administration. It administers various shipping related matters which include seafarers, marine safety, port management, etc.

Under the control of VINAMARINE, Maritime Technical and Training School No. 1 and Ho Chi Minh City Maritime Technical and Training School (formerly called the Maritime Technical and Training School No.2) supply the ratings, maritime officers and engineers in classes 3 and 4 to the shipping industry.

3) Need for Database System on Seafarers

VINAMARINE administers various activities of seafarers: education and training, issuance of seaman passport, registration card and certificate of competency.

However, an accurate data on seafarers is not yet available due to the lack of systematic updating of the database system. In order to fully understand the current situation and formulate the necessary development plan of seafarers in the future a database system on seafarers must be established and linked with the database development of VINAMARINE, which include the following:

Shipping Company Data

- Name of Company and Location of Head quarter
- Operating vessels (Name/GRT/DWT/Manning Scale/Trade Area)
- Number of Seafarers(By Rank/Certificate/Duty/Period of employment)

Maritime School Data

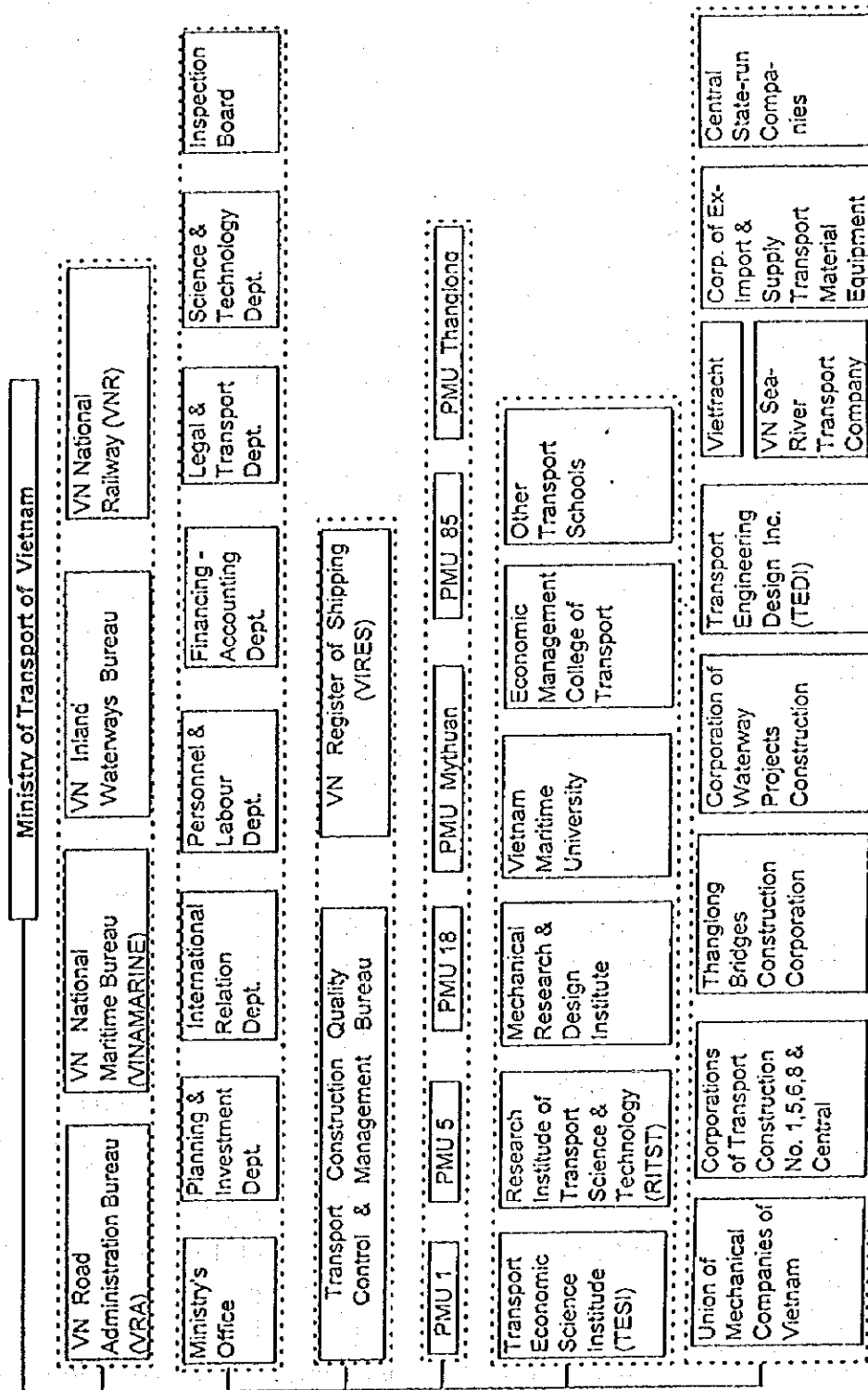
- Name of School and Location
- Capacity of Class Room/Dormitory
- Number of Enrollment and Graduates by Course
- Number of Full-time Instructors With Their Profession

License and Certification for STCW Compliance Data by VINAMARINE

- Number of Licenses and Certificates By Rank and Kind

It is essential to update the data every reporting period annually to have ready information on the exact number of seafarers at any given time.

Figure 1.1.2
ORGANIZATIONAL CHART OF MINISTRY OF TRANSPORT



Note : PMU = Planning Management Unit
 Source : Ministry of Transport (MOT)

1.2 Maritime Regulations and International Conventions

(a) Domestic Regulations

The legal basis for activities and working conditions of Vietnamese Seafarers is defined in State Council Decree No. 45-LCT/HDNN8 dated 12 July 1990, which is the Maritime Code. The code prescribes regulations on seafarers' working conditions, and are as follows:

- Article 40; The crew working on-board Vietnamese seagoing ships should have the required certificates of health and certificate of competency provided by the Ministry of Transport.
- Article 41; The crew working on board Vietnamese seagoing ships should be bound to carry out their duties within their rank.
- Article 42; Labor regulations, duties and rights of Vietnamese crew working on board Vietnamese seagoing ships are subject to the labor laws enforced in Vietnam. Labor regulations on obligations and interests of the Vietnamese crew working on board the foreign seagoing ships, and of foreign crew on board Vietnamese seagoing ships are defined on the basis of recruitment agreement.

Detailed regulations of ship crew members' functions while on-board Vietnamese ships are defined in Decision 174/QD-PCVT dated 05/02/94. Working condition are defined as follows:

- Crew working hours; not more than 44 hours of regular work a week
- Overtime shall include work performed on;
 - a) Sunday : 8 hours
 - b) Saturday : 4 hours
 - c) Holiday including Vietnamese national days: 8 hours per day
- Overtime shall be determined and prescribed by the Master of the ship.
- Total over time mentioned above all in all shall not exceed 80 hours per month.

(b) Participation in International Conventions

It is noted that although Vietnam is the 126th member of the International Maritime Organization (IMO) for 12 years, Vietnam officially participated in only 6 out of 78 IMO conventions.

In two conventions, the Vietnam Maritime University (VIMARU), Vietnam Register of Shipping (VIREs) and two organizations made important contributions in the implementation of agreements in Vietnam. Following the six conventions in international requirement for safety, security of property at sea and protection of marine environment the government of Vietnam ratified amendments:

1) International convention for the safety of life at sea (1960,1974,Protocol 1978, with amendments in 1981-1983,1994)

SOLAS 60	26 May 1965
SOLAS 74	18 March 1991
SOLAS Protocol 78	12 January 1993

The conventions made specific regulations on technical safety conditions related to ship structure, equipment and operations.

2) International Conventions on Standards of Training Certification and Watchkeeping for Seafarers, 1978

STCW 1978	18 December, 1991
STCW 1995	1 February, 1997

Through the uniform standards of training (issuing certificates to seafarers who work in different functions on-board ships), and the conventions mention the safety of people, equipment and property in maritime operations.

3) International Regulations for Preventing Collision at Sea, 1972

COLREG 1972	18 December, 1990
--------------------	--------------------------

The convention provides regulations for preventing collisions at sea and the surrounding area, as well as on navigation and equipment for the safety of sea transportation. It is the first international convention agreement that Vietnam has implemented nationwide as contained in the two decisions of the Minister of Transport (decision NO. 771/QD-PC dated 08/04/88 and Decision No. 1533/QD/PC dated 06/08/91)

4) International Conventions for the Prevention of Pollution from Ships 1973 as Modified by Protocol,

MARPOL 1973/1978	; 29 August 1991
-------------------------	-------------------------

The convention stipulates standards on ship structure, equipment and oil transfer operations to prevent pollution from oil and other toxic chemicals, as well as wastes from vessels. The convention aims to limit pollution in the marine ecosystem and these are contained in five appendices. Only the first and second appendices on oil-spill prevention and pollution control from the transport of toxic elements, respectively, were approved by the Vietnam government.

5) International Convention on Load Lines of Ships, 1966

LOADLINES 1966	; 18 March 1991
-----------------------	------------------------

The purpose of the conventions is to provide a uniform international standard of limitations on cargo transportation based on the season and area of ship operations to guarantee safety of life and property.

6) International Convention on Tonnage Measurement of ships, 1969

TONNAGE 1969 ; 18 March 1991

Aside from the IMO convention, Vietnam participated in another multilateral convention related to the maritime sector, United Nations Law of Sea, 1982 (UNLOS/1982)

(c) International Convention Related To Seafarers Education

SOLAS /60 Recommendation 39 advocates that the Contracting Government should take all practical steps, in cooperation with other Governments, to ensure the education and training of seafarers with respect to the use of aids to navigation, of life saving devices designed for the prevention of casualty incidents at sea. This shall be supplemented by a refresher course, that deals with modern technological developments in this field.

To comply with this Recommendation:

- Adequate facilities should be provided for the training of seafarers in the operation and maintenance of aids to navigation and other devices that ensure safety of life at sea.
- There should be an exchange of information on modern methods and technological advances among those concerned in the shipping industry.
- In the formulation and review of training schemes, ship owners' and seafarers' organizations must be consulted and represented.
- Satisfactory completion of appropriate training course should be among the qualifications required for the grant of appropriate certificates.

The International Conventions on Standards of Training Certification and Watchkeeping for Seafarers, 1978 (STCW-78) was introduced and enforced on 28th April, 1984. Training and certification standards should be included in training programs of the International Conventions STCW-78.

The curricula for training ship officers should include the requirements of the International Conventions for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto (MARPOL) 73/78)

The Training of Search and Rescue of deck officers should be included in the curricula which include knowledge of the contents and guidelines in using the IMO Merchant Ship Search and Rescue Manual (MERSAR).

The international conventions STCW-78 is the principal international treaty regulating seafarers' training, certification and watchkeeping arrangements, and shall form the basis of national standards worldwide. Even with high acceptance when it was adopted in 1978 it was still regarded as a compromise between those countries which need high standards and those which are concerned about their ability to implement such measures. In recent years, three particular concerns about the existing Convention were identified, which the 1995 amendment addresses:

- A set of precise standards of competence needed to perform shipboard functions safely and effectively and not only minimum knowledge of the requirements for the issuance of certificates.
- Neither the process by which countries have ratified the Convention, nor the provision of the Convention itself, are sufficient guarantees to ensure that STCW requirements are implemented worldwide or sufficiently enforced. Consequently, there has been a loss of confidence in the reliability of STCW certificates issued by some countries as an indicator of seafarers' competence.
- In order to meet the industry's future needs in the 21st Century, modern techniques in training and shipboard organization must be developed.

A comprehensive review of The STCW Convention led to its revision in July 1995. The STCW-1995 to be enforced is as follows:

- 1 February 1997; The 1995 amendments to the STCW Convention will be enforced;
- 1 August 1998; New training participants will be required to adhere to the new standards. Government will have to submit documentary evidence of IMO compliance required as per the revised Convention.
- 1 February 2002; All other transitory provisions will cease to be implemented.

1.3 The Certification System for Vietnamese Seafarers

(a) General

It is required that the crew working on-board Vietnamese seagoing ships shall obtain certificates of health and competency from the MOT (Vietnamese Maritime Code, Chapter III Ships' Crew, Article 40, Decree No. 42-LTC/HDNN8 dated 12/7/1990).

In view of the importance of maritime safety, the International Convention on Standard of Training, Certification and Watchkeeping for Seafarers (STCW) was ratified by Vietnamese Government and the convention was entered into force for Vietnam since 18th March 1991. In accordance with the STCW-78 the certification system in Vietnam was revised and stipulated the following rules and regulations.

- Rules on Examination, Certification and Rank assignment for seafarers working on-board Vietnamese ships (Issued along with the Decision No. 1299/QD-TCCB-LD dated 29/6/1993 by MOT).
- Regulations on duties of ships' crew working on-board Vietnamese ships (Issued along with Decision No. 174/QD-PCVT dated 5/2/1994 by MOT)

(b) Certification Systems

1) Certification System for Maritime Officers and Crew of Merchant Ships

The certification of merchant ships' officers and crew is governed by the "Rules on Examination, Certification and Rank assignment for seafarers working on-board Vietnamese Ships".

The certificates are classified into four classes from 1st class to 4th class, and the classes for each rank is shown in Table 1.3.1.

Table 1.3.1
OFFICERS' CLASSES REQUIRED BY RANK

Rank	1st Class	2nd Class	3rd Class	4th Class
Master	Yes	Yes	Yes	Yes
Chief Officer	Yes	Yes	Yes	Yes
2nd Officer	Yes	Yes	Yes	
3rd Officer	Yes	Yes	Yes	
Chief Engineer	Yes	Yes	Yes	Yes
1st Engineer	Yes	Yes	Yes	Yes
2nd Engineer	Yes	Yes	Yes	
3rd Engineer	Yes	Yes	Yes	

Master and Navigation Officer

Based on the gross registered tonnage (GRT) of the vessel and assigned navigation areas, ship master and navigational officers are defined, and the rank assignment is shown in Tables 1.3.2 and 1.3.3.

Table 1.3.2
CLASSIFICATION AND RANK ASSIGNMENT FOR SHIP MASTER

Tonnage(GRT)	Navigation Area		
	Ocean	Near Sea	Coastal
More than 1,600	1st Class	1st Class	2nd Class
201 - 1,600	1st Class	2nd Class	3rd Class
50 - 200		3rd Class	3rd Class
less than 50			4th Class

Table 1.3.3
CLASSIFICATION AND RANK ASSIGNMENT FOR
NAVIGATIONAL OFFICER

Tonnage (GRT)	Navigation Area								
	Ocean			Near Sea			Coastal		
	Officer			Officer			Officer		
	Chief	2nd	3rd	Chief	2nd	3rd	Chief	2nd	3rd
More than 1,600	1st	1st	1st	1st	1st	1st	2nd	2nd	2nd
201 - 1,600	1st	1st	1st	2nd	2nd	2nd	3rd	3rd	3rd
50 - 200				3rd	3rd	3rd	3rd	3rd	
less than 50							4th		

Navigation areas are defined as follows:

- Ocean; unlimited navigable waters in the world
Near sea-navigable waters limited by these lines:
latitude; 45° North and 12° South
longitude; 146° East and 70° East
- Coastal navigable water areas within 50 miles from the coastal line

Engineers

Based on the main engine output and assigned navigation areas the classification of Engineer is defined and the rank assignment are shown in Tables 1.3.4 and 1.3.5.

Table 1.3.4
CLASSIFICATION AND RANK ASSIGNMENT FOR CHIEF ENGINEER

Main Engine Output (kw)	Navigation Area		
	Ocean	Near Sea	Coastal
More than 3,000	1st Class	1st Class	2nd Class
751 - 3,000	1st Class	2nd Class	3rd Class
75 - 750		3rd Class	3rd Class
Less than 75			4th Class

Table 1.3.5
CLASSIFICATION AND RANK ASSIGNMENT FOR ENGINE OFFICER

Main Engine Output (km)	Navigation Area								
	Ocean			Near Sea			Coastal		
	Engineer			Engineer			Engineer		
	Chief	2nd	3rd	Chief	2nd	3rd	Chief	2nd	3rd
More than 1,600	1st	1st	1st	1st	1st	1st	2nd	2nd	2nd
201 - 1,600	1st	1st	1st	2nd	2nd	2nd	3rd	3rd	3rd
50 - 200				3rd	3rd	3rd	3rd	3rd	
Less than 50							4th		

Electrical Officer

Electrical Officer's license system is defined as follows:

- 1st Class - More than 1,000 KW of generator's total output
More than 600 KW of automatic control system of Generator's total output
- 2nd Class - 600 to 1,000 KW of generator's total output
301 to 600 KW of automatic control system of Generator's total output
- 3rd Class - 150 to 600 KW of generator's total output
100 to 300 KW of automatic control system of Generator's total output

Radio Officer

Radio Officer's License system is defined as follows:

- 1st Class - Ocean-going ship
- 2nd Class - Near-sea going ship
- Special Class - Coastal ship

2) General Qualifications for Obtaining a Certificate of Competency

Article 3 of the "Rules on Examination, Certification and Rank Assignment for Seafarers Working On-board Vietnamese Ships" call for a mandatory qualification to which all applicants have to satisfy the following:

- Shipboard title of applicant should match the respective specialization in which he was educated.
- Applicant should have graduated from any of the maritime university or maritime schools.
- If the applicant has graduated from another maritime-related university, college or school in a field of specialization close to or similar to that of merchant ship's

seafarers course, he must obtain additional education and training from the specialized maritime university, college or school, respectively.

- The applicant must satisfy all relevant requirements on the "sea service experience" record of the Vietnam National Maritime Bureau.
- The applicant must satisfy the National Maritime Examination for Seafarer's Certificate of Competency in the corresponding class and title of the certificate for which he is applying.
- The certificate of application must contain favorable endorsement from his company authorities on his job performance, career aspirations, etc.
- The applicant must have certificate for health fitness, professional education and sea service records.

3) Certification System for Pilot

There are three pilotage systems in Vietnam:

Pilotage Association of First Zone; (in the South of Vietnam)

- with head office in Ho Chi Minh city
- river/harbor pilot service for the Sai Gon port waters
- (Vung Tau anchorage-Long Tau river-Sai Gon port)
- river pilot service for Cambodian transit water ways
- deep sea pilot for the SPM terminals of offshore oil fields

Pilotage Association of Second Zone; (Central Part of Vietnam)

The Pilotage Association of Third Zone ; (North of Vietnam)

- with head office in Haiphong city
- harbor pilot service for the port Haiphong
- sea pilot service for the port of Hong Gai

For the other small ports and harbors, pilotage is controlled by the Port Authorities. At present, there is no specific educational training dedicated for pilots, but each pilot association has its own on-the-job training system. The new pilots are selected from Marine Masters, Navigational officers or graduates of Vietnam Maritime University's Navigation Department or from equivalent institutions.

The Pilot's certificate can be categorized in to four classes namely: Third Class, Second Class, First Class, and Senior Pilot Class.

They start their career as training pilots for a minimum period of 12 months to 24 months and maximum of 36 months depending on the qualification of the applicant. Once the training is completed, a training pilot can apply for a third class pilot's certificate by attending a higher course and he then takes the examination administered by the Vietnam National Maritime Bureau.

1.4 National Examination System for Ship's Officer

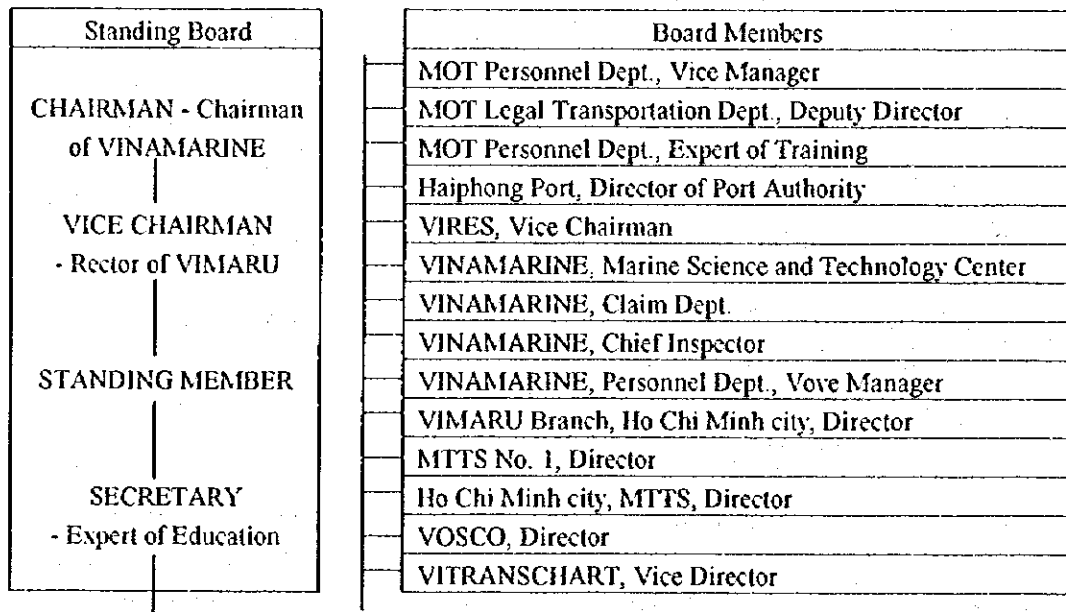
(a) Organization

Articles 24, 25 and 26 of the "Rules on Examination, Certification and Rank Assignment for Seafarers Working On-board Vietnamese Ships" stipulate the general rules and regulations of the National Examination for maritime certification.

The national examination for maritime certification is administered by the National Maritime Examination Board. The National Maritime Examination Board (VINAMARINE) is chaired by the Chairman of the VINAMARINE and the Vice Chairman who is the Director of the Vietnam National Maritime University (VIMARU), and the Organization of the National Maritime Examination Board is presented in Figure 1.4.1.

Figure 1.4.1

NATIONAL MARITIME EXAMINATION BOARD (AS OF AUGUST 1996)



(b) The National Examination for Ship's Officers

The national examination for the license of ship master and chief engineer is held only once a year, while the national examination for the license of other officers and engineers is conducted on a regular basis; 12 times a year.

Based on the examination results of the applicant, the Chairman of VINAMARINE will issue the Certificate of Competency to applicants who attended the skills upgrading courses and passed the final examinations. The number of seafarers who passed the examination for the past two years is shown in Table 1.4.1.

Table 1.4.1
NUMBER OF SEAFARERS WHO PASSED
THE NATIONAL MARITIME EXAMINATION

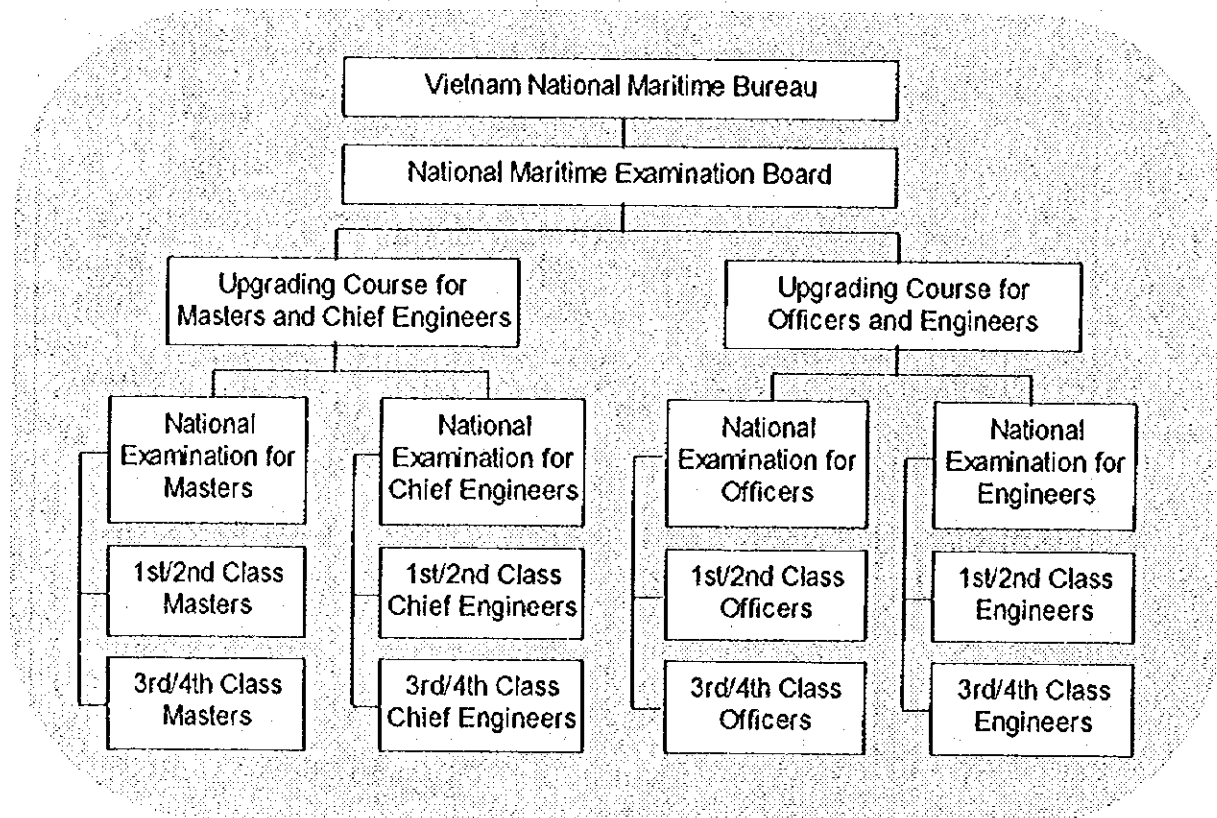
Rank	Class	1994	1995	Total
Ship Master	1	23	37	60
	2	12	9	21
	3	67	13	8
	4	115	87	202
	Total	217	146	363
Chief Engineer	1	15	28	43
	2	8	6	14
	3	6	4	10
	4	71	48	119
	Total	100	86	186
Electrician	1	7	0	7
	2	12	0	12
	Total	19	0	19
Other Officers	Officer	331	377	708
	Engineer	217	284	501
	Total	548	661	1,209
Grand Total		884	893	1,777

Source: Report by the National Maritime Examination Board

(c) Skills Upgrading Courses for the National Maritime Examination

Before the applicants can take the National Maritime Examination in Vietnam they must have attended skill upgrading courses and must have the appropriate maritime certification. The skills upgrading courses for the examination are approved by the MOT, and are held at VIMARU and MTTTS. The system for the upgrading courses are shown in Figure 1.4.2.

Figure 1.4.2
SYSTEM OF SKILLS UPGRADING COURSES FOR MARITIME CERTIFICATION



(d) The National Maritime Examination for Electrical Officers, Electricians and Radio Officers

The National Maritime Examination Board likewise administers the examination for the certification of Electrical Officers and Electricians regularly. These examinations are taken either together with Engineers or separate.

For the certificates of Radio Officers, the Department General of Post and Telecommunications is authorized to organize the examinations and issue the Certificates with the cooperation of the Vietnam National Maritime Bureau.

(e) Career Required for Maritime Certification After Graduation

After Graduation from Maritime Schools, the applicants for the national maritime examination are required to complete sea service on-board ships which is stipulated in the "Rules on Examination, Certification and Rank assignment for seafarers working on-board Vietnamese Ships".

The minimum requirement of on-board services and the process of upgrading maritime licenses are shown in Figure 1.4.3 for class 2, and Figure 1.4.4 for class 3.

The minimum requirement of sea service experience-on-board ships will be assessed according to ship's category and trade area. The minimum period required for the service record can be reduced to one-third upon consideration of the performance level and high marks of the applicant concerned. A graduate from VIMARU can become a ship master or chief engineer of class 1 with a minimum sea service experience of 8 years.

Figure 1.4.3
REQUIRED CAREER FOR MARITIME CERTIFICATION (CLASS 1 AND 2)

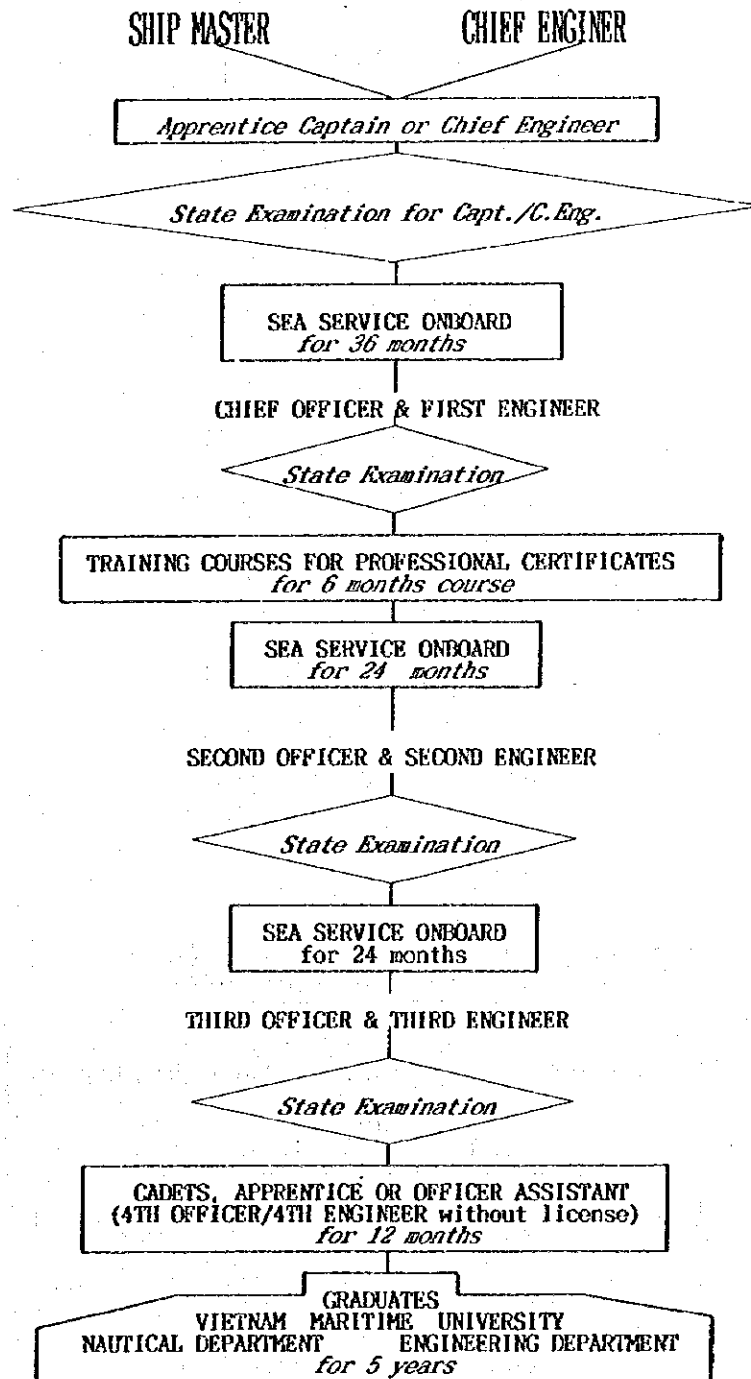
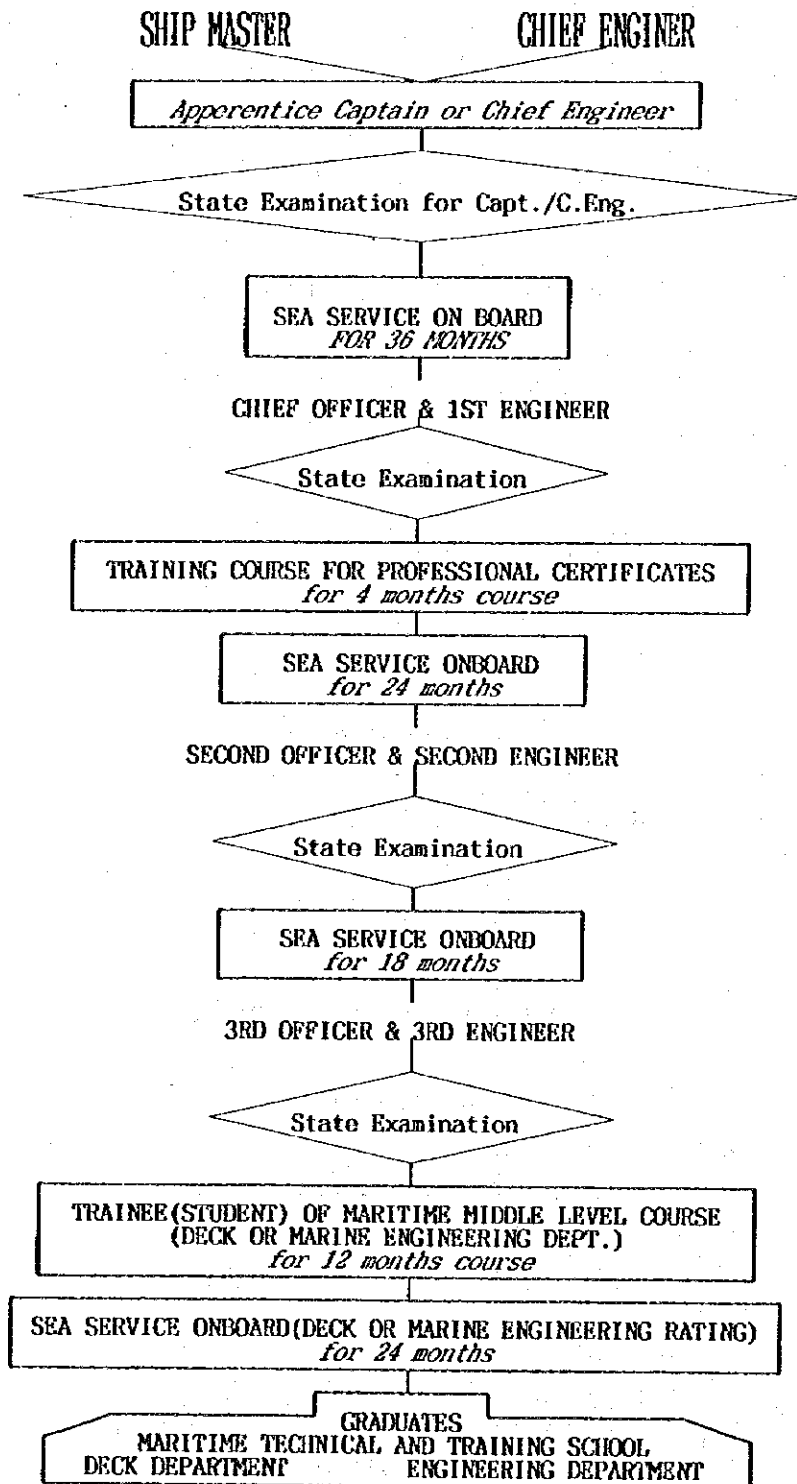


Figure 1.4.4
 REQUIRED CAREER FOR MARITIME CERTIFICATION (CLASS 3 LICENSE)



1.5 Special Qualification Certificates

(a) General

The International Conventions STCW-78 and amendments STCW-95 stipulate not only the qualifications of ships officer but of all seafarers including their ratings. All seafarers working on-board ship must have the following certificates of specialized training and qualification.

- Radar simulation (for Ship Master and Navigational Officers)
- Tanker safety familiarization (for officers and ratings involved with tanker operations)
- First aid and medical care (for designated officers and ratings)
- Fire fighting /advanced fire fighting (for designated officers and ratings)
- Personal survival and life saving (for all officers and ratings)
- Ability to handle engine malfunction.

(b) The Special Qualification Course

The International Convention STCW-78 was implemented on 28 April 1984. The government of Vietnam ratified the STCW-78 which became valid from 18 March 1991 and VIMARU was authorized MOT to provide the necessary education and training to ensure the competence of ship masters, officers and ratings for safer and efficient operations of all seagoing ships.

In order to comply with the requirement of the International Convention STCW-78, VIMARU implemented IMO model courses on their curricula in 1993.

In addition to the maritime education and training of freshmen of the university, the Marine Training Center was established in VIMARU with the following objectives:

- Provide training courses with certificates of competence;
- Proficiency and upgrading courses for senior officers for specific functions;
- Specialized Courses designed to improve technical knowledge; and awareness of technological developments in the maritime industry.

VIMARU has the following special courses for seafarers:

- Radar Simulation
- Tanker Safety familiarization
- First Aid
- Fire Fighting
- Survival and Life Saving

The Maritime Technical and Training Schools likewise organized the following special courses for seafarers:

- Radar operations and plotting
- Survival craft
- First aid
- Fire fighting
- Watchkeeping

Further, the Maritime Promotion Upgrading Center (MAPROCEN) together with different shipping and crew manning companies organized the Special Qualification Courses which provide the special qualification certificates to seafarers concerned. However, most of the instructors for these courses will come from maritime schools.

(3) Problems on Special Training Courses

Following are the problems on special training courses;

- A large gap exist between the quality of training equipment used those required based on standards by the STCW-78/95 and SOLAS conventions,
- There is no adequate number of instructors qualified to teach the training courses,
- To open many training centers with the lack of proper equipment and shortage of qualified instructors, will result to substandard levels of qualification.

1.6 Maritime Schools

1.6.1 Structure of Maritime Education and Training

There are two levels of maritime education and training system in Vietnam: vocational and university education.

The university education and training of seafarers are carried out at Vietnam Maritime University (VIMARU) Haiphong and its branch in Ho Chi Minh City. VIMARU, Haiphong and Ho Chi Minh City Branch is under the jurisdiction of MOT and the highest maritime educational institution not only for ship's officers but for all maritime personnel in Vietnam.

The Maritime Technical and Training School (MTTS) No. 1, Haiphong and Ho Chi Minh City, Maritime Technical and Training School (formerly the Maritime Technical and Training School No. 2, Ho Chi Minh City) are under the jurisdiction of VINAMARINE. The MTTSs are the training schools for coastal officers and ratings for the maritime sector.

In addition to the above maritime schools, under the jurisdiction of Inland Waterway Bureau there are some schools for officers and crew of inland waterway ship. These schools include:

- The Riverway Technical School No. 1, Hai Hung,
- Inland Navigation Training Center, Ho Chi Minh City (formerly Technical and Professional Navigation Center No.2); and
- Technical Worker Waterway School, Haiphong.

1.6.2 VIMARU , Haiphong and the Branch in Ho Chi Minh City

(a) A brief history of the establishment of Vietnam Maritime University is as follows:

- 1956: it was founded as the Institute of Navigation in Haiphong;
- 1957: it was named as Vietnam Nautical School;
- 1976: the establishment of Vietnam Maritime University;
- 1984: Completion of Vietnam Maritime University's establishment.

(b) Function and Assignment

As the highest maritime educational institution in Vietnam, VIMARU Haiphong and Ho Chi Minh City Branch have produced several graduates who became actively involved and assumed important position in the maritime sector of the country.

At present, enrollees are not limited to local students but include students from foreign countries such as Cambodia, Myanmar and Laos.

The University provide education and training to freshmen (three-year course), Bachelor of Science degree (five-year course) and Bachelor of Science (five years including practicum). In addition, within the academic curriculum there are upgrading courses for obtaining the higher rank of certificate of competency (maritime licenses) , and refresher courses for international requirements and for acquiring qualification and certification. The number of graduates of the university is shown in Table 1.6.1.

Table 1.6.1
NUMBER OF GRADUATES OF VIMARU

Field of Education	Entrants	Upgrading	Refreshers
VIMARU in Haiphong			
1) Navigation	5,540	570	6,000
2) Marine Engineering	5,000	390	5,500
3) Marine Electric, Electronic Radio Communication	1,078	170	915
4) Sea Transport Economic	2,850		
5) Naval Architecture	2,988		
6) Port-Hydro-Engineering and Navigational Safety	620		
Branch in Ho Chi Minh city			
1) Navigation	328		3,200
2) Marine Engineering	205		2,880
3) Sea Transport Economic	289		
Total	18,278	1,130	18,495

(c) Branches of the University

VIMARU's main department is located in Haiphong and its branch in HCM City. The number of students and graduates in these branches are shown in Table 1.6.2.

Its teaching staff consists of a director, 4 vice-directors and 575 lecturers in VIMARU Haiphong, and a director, a vice director and 265 lectures in the HCM Branch.

Table 1.6.2
NUMBER OF STUDENTS AND GRADUATES OF VIMARU

5/3 years education	Freshmen		2nd		3rd		4th	5th	Graduates
	5	3	5	3	5	3	5	5	1995/1996
VIMARU in Haiphong									
1) Navigation	121	78	84	126	58	111	28	48	50
2) Marine Engineering	100	82	96	68	55	19	8	25	35
3) Marine Electric, Electronic Radio Communication	61	0	37	0	29	0	6	18	13
4) Sea Transport Economic	91	66	117	163	97	58	28	63	52
5) Naval Architecture	174	0	113	0	156	0	40	47	42
6) Port-Hydro-Engineering and Navigational Safety	60	0	18	0	36	0	14	19	11
Sub-Total	607	226	465	357	431	188	124	220	203
Branch in HO Chi Minh city									
1) Navigation	110	136	105	124	60	54	54	30	48
2) Marine Engineering	105	128	64	60	28	27	38	23	37
3) Marine Electric, Electronic Radio Communication	51	0	0	0	0	0	0	0	0
4) Sea Transport Economic	95	150	110	254	107	202	123	75	99
Sub-Total	361	414	279	438	195	283	215	128	184
Grand Total	968	640	744	795	626	471	339	346	387

Source: VIMARU

(d) Education and Training for Seafarers

There are two courses comprising 5 and 3 years each in Navigation and Marine Engineering and 5-year course in Marine electric, electronic and communication.

In accordance with the new IMO courses, VIMARU revised the curricula in 1993. The curricula for seafarers for each department such as Navigation/ Marine Engineering/ Marine Electric, Electronic and radio communication are shown in Figures 1.6.1, 1.6.2, 1.6.3. The other curricula are presented in Appendix 1.

The basic course takes place in the first four semesters followed by training related to the specific field of study. For a 5-year educational course, the shipboard training is scheduled on the 5th semester and 42 weeks of practicum until the 10th semester. If the student is able to complete all the courses, he then completes a term paper and must pass the state examination before he earns a Bachelor of Science degree in Navigation or Marine Engineering.

(e) Training of Seafarers and Other Maritime Personnel

Skills Upgrading Courses are also held to enhance the skills and knowledge of seafarers. These courses are conducted at “the Maritime Training Center” in VIMARU Haiphong and “South Seafarers’ Training and Employment Center” in VIMARU branch in Ho Chi Minh City. Following are the courses conducted at the Training Centers:

- Competency Course
- Proficiency and skills upgrading courses for senior officers
- Specialized courses to improve the technical skills and updates on modern technological developments in the maritime sector.

The training courses are designed according to the needs of ship owners and maritime-related industries. These programs comply with international requirements and Vietnamese regulations, and are taught by VIMARU instructors and shipping experts from shipping companies. The Center provides the following skills upgrading for the following:

- First class master,
- Second class master,
- Third class master ,
- Fourth class master,
- First class chief engineer,
- Second class chief engineer,
- Third class chief engineer, and
- Fourth class chief engineer

Other Courses include:

- Radar Simulation
- Use of Automatic Radar Plotting Aids
- MARPOL 73/78 ANNEX I
- MARPOL 73/78 ANNEX II
- Medical Emergency Basic Training
- Personal Survival
- Basic Fire Fighting
- Oil Tanker Familiarization
- Advanced Training on Oil Tanker Operation
- Maritime Search and Rescue Co-ordination
- Engine Room Simulation
- Survey of Machinery Installation
- Survey of Electrical Installation
- Port Operation
- Marine Accident and Investigation
- Maritime Search and Rescue Administration

- Maritime Search and Rescue Mission
- Fleet Maintenance and Protection

Figure 1.6.1
CURRICULUM OF NAVIGATION DEPARTMENT (VIMARU)

No.	Subjects	Class Hours	No.	Subjects	Class Hours
1	Philosophy	90	19	Marine Electronics	90
2	Economics	90	20	Fundamentals of Seamanship	60
3	History	60	21	Ship Structure and Maintenance	186
4	Geography	50	22	Ship Automation	84
5	Maritime English	510	23	Meteorology and Maintenance	84
6	Physical Training	120	24	Maritime Safety	90
7	Advanced Mathematics	300	25	Magnetic Compass	56
8	Applied Mathematics	105	26	Sea-Transport Economics	153
9	Physics	210	27	Ship Maneuvering and Collision Avoidance	117
10	Chemistry	75	28	Maritime Law and Insurance	109
11	Descriptive Geometry	60	29	Cargo Work	88
12	Technical Drawings	30	30	Terrestrial Navigation	219
13	Theoretical Mechanics	120	31	Celestial Navigation	146
14	Fluid Mechanics	70	32	Electronic Navigation System	269
15	Thermal Technology	60	33	Ship Propulsion Plants	78
16	Information and Computer Science	75			
17	Strength of Materials	90			
18	Electrical Technology and Marine Electricity	146			
				Total	4,090

- Note: 1) Training duration (5 years)
Lecture: 119 weeks, Training Job: 42 weeks, Graduation paper and Examination : 16 weeks
- 2) Graduation Requirement:
Graduation Paper/Examination in English/Navigation Subjects/ Electronic Navigation System

Figure 1.6.2
MARITIME ENGINEERING DEPARTMENT CURRICULUM

No.	Subjects	Class Hours
1	Philosophy	90
2	Economics	90
3	History	90
4	Maritime English	460
5	Physical Education	120
6	Advanced Mathematics	300
7	Applied Mathematics	60
8	Physics	210
9	Chemistry	90
10	Descriptive Geometry	60
11	Technical Drawings	90
12	Theoretical Mechanics	110
13	Marine Electrotechnology	90
14	Marine Electronic Technology	60
15	Information and Computer Science	75
16	Strength of Materials	120
17	Metallography and Metal Processing	105
18	Mechanics of Machines	75
19	Machinery Details	90
20	Techniques of Measuring	45
21	Pneumatics - Hydraulics	60
22	Technical Chemistry	45
23	Ship Structure, Strength and Stability	75
24	Fundamentals of Seamanship	60
25	Theory of Automation	75
26	Marine Steam Plants	105
27	Technical Thermology and Heat Transmission	110
28	Ship Auxiliary Machinery	120
29	Diesel Engine and Marine Gas Turbin	150
30	Marine Electricity	90
31	Operation of Marine Diesel Engine Plant	100
32	Maintenance and Repair Techniques	105
33	Safety and Maritime Law	78
34	Refrigeration, air conditioning and heat- Exchange Equipment	75
35	Automatical Systems of Ship	66
Total		3,804

- Note: 1) Training duration (5 years)
- | | |
|----------------------------------|-----------|
| Lecture | 119 weeks |
| Training Job | 34 weeks |
| Graduation paper and Examination | 16 weeks |
- 2) Graduation Requirement Graduation Paper/Examination in English/Professional Subjects

Figure 1.6.3
**ELECTRIC/ ELECTRONIC (RADIO OPERATORS)
 DEPARTMENT CURRICULUM**

SUBJECT	CLASS HOURS
1. Philosophy	90
2. Economics	90
3. History	60
4. Geography	50
5. English	432
6. Physical education	90
7. Mathematics	360
8. Physics	180
9. Principles of computer science	110
10. Naval architecture	16
11. Theory of electrical circuits and signal	304
12. Electronic meteorology	128
13. Electronic equipment technology	64
14. Elements of electronic devices	112
15. Electromagnetic field theory and microwave technique	96
16. Analogue systems	384
17. Digital systems	208
18. Fundamentals of telecommunication	96
19. Control theory and systems	64
20. Marine transmission technique	124
21. Marine receiving technique	224
22. Ship antennae	48
23. Marine communication systems	92
24. Ship T.V. Systems and equipment	64
25. Radio navigational systems and equipment	158
26. Electro navigational equipments	48
27. Ship communication equipment operation and diagnostics	112
28. International radio regulations	60
29. Maritime safety	60
Total	3,864

Training duration: 5 years

Lecture: 131 weeks

Practice: 36 weeks

Graduation thesis and graduation examinations: 12 weeks

+ Shipboard practice 36 weeks divided into:

- Radio operator's practice: 17 weeks

- Graduation practice: 19 weeks

+ Graduation examination:

- English exam

- Interview on graduation thesis.

+The student study five days a week and six hours a day.

1.6.3 Maritime Technical and Training School No. 1, Haiphong

The Maritime Technical and Training School (MTTS) No. 1 was founded in 1972, and is located at the south-eastern part of Haiphong City with an area of 3.2 has. Its building has an area of 5,000 meters and has 15 classrooms, and 1,000 sq. m. of work shop.

MTTS No. 1 started as a vocational school for education and training of ship ratings. At present, the supply ratings of coastal and international shipping and coastal officers of class 3 and class 4 are based on the following courses:

• Maritime Rating Course for Seamen	18 months
• Maritime Rating Course for Motormen	18 months
• Middle Ranking Course (for Class 3)	12 months
• Master, Chief Engineer Course (for Class 4)	4 months
• Boatswain Course	4 months
• Donkey Course	4 months

Since its establishment in 1972, it was reported that the school had trained the following seafarers and maritime personnel:

- 2, 996 Deck ratings
- 2, 755 Engine ratings
- 1, 122 Ship Masters and navigational officers
- 890 Chief engineers
- 139 Ship electricians
- 60 Radio operators
- 69 Stewards
- 75 Tallymen
- 320 Boatswains
- 1,219 Skilled seamen
- 105 Engine fitters, welders and engine repair workers
- 500 Skilled motormen
- 550 Engine trainees
- 75 Additional secondary school pupils
- 50 High school skilled trainees

Graduates of MTTS No. 1 have been working on-board sea going vessels or coastal vessels, in the maritime sector in Vietnam. IT is required that they have finished secondary school and must be between 17-25 years old. The educational equipment and training ships that are being used in training are obsolete and below the international standards.

The teaching staff of the school comprised of 34 engineers, 30 technicians, 25 Captains and Chief Engineers.

1.6.4 Ho Chi Minh City, Maritime Technical and Training School (HCM MTTS)

This training school is located in the south-eastern part of Ho Chi Minh City. Since its establishment in 1976, the school has trained the following under each course:

- Long term courses - over 3,000 trainees
- Refresher and upgrading courses - over 800 trainees

The graduates of the school are now employed in the maritime sector, provincial shipping companies and other shipping-related companies.

Ho Chi Minh City MTTS offers the following courses:

- Maritime Rating Course for Seamen - 18 months
- Maritime Rating Course for Motormen - 18 months
- Vocational High School Course - 36 months
- Middle Ranking Course (for class 3) - 12 months
- Master, Chief engineer Course (for class 4) - 4 months
- Boatswain Course - 4 months
- Donkey Course - 4 months

HCM-MTTS has 105 officials including 65 teachers and teaching staff consisting of:

- University graduates - 22
- College graduates - 31
- Skilled workers - 12

Applicants for the maritime rating courses must be graduates of upper secondary education (12th grade). Since the start of the Vocational High School Course in 1996, graduates from lower secondary education 9th grade can take up the course for a period of 36 months.

The enrollment and number of graduates in the past 3 years are presented in Table 1.6.2.

Table 1.6.3
NUMBER OF ENROLLMENT AND GRADUATES OF HCM-MTTS

Year	Enrollment	Graduates
1993	245	241
1994	230	225
1995	240	237

The curricula is shown in Table 1.6.3 for:

- Maritime Rating Course for Seamen
- Boatswain Course
- Maritime Rating Course for Motormen
- Donkeyman Course

Figure 1.6.4 presents the following courses:

- Deck Department Middle Ranking Course
- Marine Engineering Middle Ranking Course
- Master Course (for classes 3 and 4)
- Chief Engineer Course (for classes 3 and 4)

Table 1.6.4
CURRICULUM OF MARITIME RATING COURSES/BOATSWAIN
COURSE/MARITIME RATING COURSE FOR
MOTORMEN/DONKEYMAN COURSE IN HCM MTTS

Curriculum	Deck Rating	Bosun	Maritime Engineering Rating	Donkeymen
1. Ship Construction	X	X	X	
2. Cargo Works	X	X		
3. Maritime Law (Navigation Rules & Law)	X			
4. Ship Handling	X			
5. Seamanship	X	X		
6. Seaman Regulation	X	X	X	
7. Labor Safety	X	X	X	X
8. Sea Transport Economics	X		X	
9. English	X		X	
10. Politics	X		X	
11. Military	X		X	
12. Maritime Geography	X			
13. Life-boat Maneuvering		X		
14. Maritime Diesel Engine	X		X	X
15. Maritime Electricity	X		X	X
16. Technical Mechanics	X		X	X
17. Technical Drawing			X	X
18. Metal Material and Metal Technology			X	X
19. Machinery Installation			X	X
20. Marine Engine Repair Technology			X	X
21. Marine Auxiliary Engine			X	X
22. Lathering Theory				X
23. Metal Cutting Theory				X
24. Welding Theory				X

Table 1.6.5

**CURRICULUM OF DECK DEPARTMENT MARINE ENGINEERING/ MASTER COURSE
(FOR CLASSES 3 AND 4)/ CHIEF ENGINEER COURSE
(FOR CLASSES 3 AND 4) IN HCM MTS**

Curriculum	Deck Dep. Middle- level	Marine Engineering Middle level	Master Class 3,4	Chief Engineering Class 3,4
1. Ship Construction	X	X	X	X
2. Mathematics	X	X		
3. Politics	X	X		
4. Navigation	X		X	
5. Electronic Navigation	X		X	
6. Material Strength	X	X		
7. Theoretical Mechanics	X	X		
8. Technical Drawing	X	X		
9. Celestial Navigation	X	X		
10. Maritime Law	X		X	
11. Meteorology and Hydrography	X			
12. Cargo Marketing	X			
13. Sea Transport Economics	X	X		
14. Ship Maneuvering	X			
15. Outline of Marine Power Plant	X		X	
16. Operation of Marine Power Plant		X		X
17. Marine Diesel Engine		X		X
18. Marine Auxiliary Engine		X		X
19. Marine Electric System		X		X
20. Marine Engine Repair		X		X
21. Labor Safety	X	X		
22. Seaman Regulations	X	X		
23. Engine Operation				
24. Engine Disorders				
25. Fuel Oil-Lubrication Environmental Protection				
26. Cargo Works			X	
27. Shipping Business			X	
28. Communication at Sea			X	
29. Emergency Situation Treatment			X	
30. Chief Engineer Qualification				X
31. Marine Insurance	X		X	
32. Technical Thermology		X		
33. Machinery Principles and Details		X		
34. Material, Metallurgy		X		
35. Machinery Installation Technical Measurement		X		
36. English	X	X	X	X
37. Ship Maneuvering/ Steering			X	

Chapter 2. Future Demand for Seafarers

2.1 Aspects of Future Demand

2.1.1 Technical Aspect

(a) Modernization of Maritime Technology

Maritime technology developed at a slow pace until the end of the 1960s when the remote control system was used on-board ships. This technological development made it possible to control, check, verify and monitor the operation systems of the ship from the control rooms, without any personnel to man the engine room.

Further, technological developments were introduced in navigational equipment such as electronic and satellite navigational systems, radiotelegraphy and communication systems. Since then, modern technology's adoption in shipping industry was at a rapid pace resulting to ships becoming larger and more sophisticated.

(2) Requirements of Safe and Efficient Operation of the Ships

Since the ships became larger and equipped with modern equipment accident has seldom happened. If a huge tanker encounters serious trouble, this incident not only results to a substantial damage to the ship itself but causes pollution and extreme damage to marine environment. It was reported, that in most cases the common cause of marine accident is human error.

The International Maritime Organization (IMO) has recognized that the most important way to prevent maritime accident and marine pollution is to design, construct, equip and maintain ships and to operate them safely with properly trained crew.

The International Convention STCW-78, and the amended STCW-95 stipulate the technical standards, rules, regulations and codes of practice and minimum standards of competency for worldwide seafarers to ensure the safe operation of different ship types and prevention of marine pollution.

The convention incorporates measures designed to help ensure the contracting governments to actually implement STCW-78/95 requirement, and the certificates are issued only to seafarers that meet the minimum competency standards.

The convention contains a wide range of other provisions most significant of which is the use of simulators in training, and the qualification of training of instructors.

2.1.2 Manpower

(a) Manning Requirements of Vietnamese Ships

The minimum manning requirements for each type of Vietnamese ship is not indicated but the present manning pattern indicate that there are more seafarers on-board Vietnamese shipping vessels as compared to international standards on manning. Refer to Table 2.1.1.

Table 2.1.1
STANDARD MANNING OF VIETNAMESE SHIPS BY CATEGORY

Seafarers' Rank	Category 1 Worldwide	Category 2 Limited Sea	Category 3 Coastal	Category 4 Near Coastal
Deck Officers	5	4	3	2
Engine Officers	5	4	3	2
Radio Officers	2	1	1	0
Deck Ratings	8	7	5	3
Engine Ratings	5	5	4	3
Catering Dept.	4	2	2	0
Total	29	23	18	10

Manning requirements must be based on a reasonable number of each officer type or rating that required for any ship. Following are the criteria on manning:

- Trade area, tonnage, type and number of main engine and watchkeeping arrangements;
- Construction, technical equipment and special requirements of the ship including age and condition of ship;
- Safety requirements to cope with on-board emergency equipment and assistance to other ships in distress;
- Responsibilities following the need for environmental protection;
- Working hours, peak workload situation, human endurance and health factor;
- Maintenance and manual control of equipment and repair of malfunctioning automatic and remote control equipment.

With the modernization of Vietnamese fleet, there's a need to review the manning of Vietnamese ships. The Study team assessed that it is possible to operate a modern ship with only about 50 to 80 % of the present standard manning.

(b) Electrical Personnel

The Electrical engineer is in-charge of the electrical systems. In international shipping, the task of electrical engineer is performed by marine engineers.

VIMARU has a plan to implement a maritime education and training system for marine engineers in two areas, maritime electronic technology and shipboard electrical system in order for the marine engineers to undertake the electric engineer's function on-board. This training program was implemented in 1990. It is essential to educate and train qualified seafarers who have the ability to work on multiple tasks in the future.

(c) Radio Operator's Function and GMDSS Radio Personnel

To prepare for the full introduction of GMDSS schedule in the year 1999, the conventional ships (all passenger and cargo ships of 300 GRT and above that are in engaged international navigation) shall be mandatorily required to be provided with SOLAS equipment in compliance with the 1988 amendment to the SOLAS Convention. It is essential for the contracting countries to establish an international system to ensure the complete introduction of the GMDSS.

The number of radio operators holding internationally recognized certificates has increased in connection with the installation of GMDSS equipment on-board. Under the GMDSS system the operation of automated communication apparatus has been simplified to enable any person to handle them easily, but their maintenance has become essential. Moreover, it is indispensable for those who are in-charge of emergency communication covering distress call at sea, to know the details of the operations manual.

The amended International Convention STCW-95 defines the qualifications required to operate the equipment, while the Radio Regulation stipulates the requirements for the certification of radio operators.

In the future, there will be greater need for education and training of radio personnel who are qualified to use the GMDSS equipment as well as for the establishment of a complete certification system.

Since the holder of the GOC can operate at sea, the navigational officers are authorized to act as radio operators with GOC Certificate in lieu of specialized radio personnel. Exempted are the ship for maintenance service at sea and passenger ships.

Table 2.1.2. shows the certification system for GMDSS radio personnel.

Table 2.1.2
THE CERTIFICATION SYSTEM OF GMDSS RADIO PERSONNEL

Qualification	Authorized Work Area
1st Class Radio Electronic Certificate (1st REC)	Operation and full-scale maintenance work of equipment
2nd Class Radio Electronic Certificate (2nd REC)	Operation and limited maintenance (replacing parts) of equipment
General Operator's Certificate (GOC)	Operation of equipment only
Restricted Operator's Certificate (ROC)	Operation of equipment at sea area 25 miles from coastal station

(d) Dual-Function Seafarers

There are modern ships with modern watchkeeping system, so much so that a navigational officer or engineer will have the dual-function license for watchkeeping at deck or engine control room during navigation at sea.

In order to prepare for the introduction of such watchkeeping system on either Vietnamese fleet or foreign ships with Vietnamese seafarers on-board, VIMARU shall design a training program that will educate and train dual-function seafarers in the year 2000. Over the period 1994 - 1999 the academic programs for navigation and marine engineering will have similar maritime subjects for about 30% of the respective curriculum and after the year 2000 the syllabus shall be come a dual-purpose training program.

Thus, the certification system for Vietnamese seafarers must be amended for the implementation of the dual-function licenses.

2.2 Proposed Practical Training and Training Equipment in the Maritime Schools

2.2.1 Importance of Practical Training

(a) General

In addition to education, there is a needed for practical training (both in class room and on-board) to enhance maritime technical ability in compliance with the minimum requirements for certification of maritime officers.

The objectives of practical training are to:

- gain experience in shipboard activities as they occur on-board the ship,
- test the knowledge acquired in education and training courses with actual practice,
- achieve the standards of competence required by the STWC-95, and
- prepare for a future position of responsibility on-board the vessel.

(b) Required Practical Training for Certification

Training must be undertaken in accordance with the approved training program. Candidates for certification of maritime officers are required to have certified seagoing service experience of not less than three years. The period for training to obtain the initial maritime officer certification is shortened from three years to one year if the on-board training record is accepted and proven that:

- the training and service experience undertaken are under the supervision and monitoring of qualified officers, and
- adequately documented in the Training Record Book.

Candidates for the certification of maritime officers are required to have basic training and education in:

- Radar observation and plotting;
- Radar and ARPA simulation training;
- Basic training in fire fighting/advanced training in fire fighting;
- First aid medical care;
- Personal survival and life-saving, search and rescue; and
- Tanker operations and prevention of marine pollution.

2.2.2 Provision of Simulator-Assisted Training

(a) Simulator-Assisted Training As Regulated in STCW Convention

In view of the importance of practical training to gain maritime technical ability, and on-board experience, the use of simulators was regulated in the amended convention STCW-95. The objectives of simulator-based training are defined within the overall training program and that specific training objectives and tasks shall relate to shipboard tasks and practices.

Based on the amended convention STCW-95, the Automatic Radar Plotting Aid (ARPA) simulation was regulated as a mandatory simulator-based training for certification of ships, master and navigational officers. There is a transitional provision that until February, 2001, the party may continue to issue, recognize and endorse certificates in accordance with the provisions of the Convention which became effective prior to 1 February 1997. With respect to seafarers who have previous seagoing service, they may be granted an approved education and training program before 1 August 1998. It is therefore strongly recommended to implement the simulator-based training on Radar and ARPA training.

(b) Other Simulator-Based Training

In addition to the simulator-based training on Radar and ARPA training, it is recommended that the simulator-based training shall apply to:

1) GMDSS and Radio Communication

GMDSS will be introduced starting 1 February 1999. It is essential to establish an international system for GMDSS, radio operations, GMDSS personnel must be educated and trained effectively using GMDSS and Radio Communication training simulator.

2) Tanker Familiarization and Oil Transfer Operation

Considering the country's increasing demand for personnel in tanker operation, oil refinery and processing industries in the future, it is important to establish a simulator-based training for familiarization with tanker operations and oil transfer operations.

3) Training of Engineers in the Operation and Handling of Machine and Equipment in the Engine Room

Due to the lack of opportunity for the training of Vietnamese engineers and seafarers, it is necessary to train them using the simulation system.

4) Training of Masters, Navigational Officers and Pilot by Ship Maneuvering

For the training of Masters, Navigational officers and pilot on maneuvering of various types of ships, it is recommended to use Ship maneuvering simulator.

2.2.3 Problems of Vietnamese Maritime Schools

(a) Lack of Equipment for Training and Education

There is a large gap between the quality of education, and training equipment maritime schools in Vietnam and the requirements under the STCW-78 and STWC-95 convention.

Vietnam maritime schools encounter difficulty in supplying seafarers who have actually completed the requirements of the STWC-78 and the New Code of the amended convention STWC-95 which took effect on 1 February 1997.

Maritime schools likewise have difficulties in supplying seafarers qualified for a modern vessels. The present education and training programs being undertaken in maritime schools have not reflected the technology adopted in modern ships because they lack the necessary modern training equipment.

The educational curriculum and training equipment of maritime schools in Vietnam do not provide adequate training skills to seafarers in order for them to be qualified to undertake efficient ship operations using equipment of international standards.

Table 2.2.1. presents the list of existing training equipment in VIMARU Haiphong.

The same is true for other maritime schools where the training equipment of MTTs are considered sub-standard and obsolete in some cases.

Table 2.2.1
LIST OF CURRENT TRAINING EQUIPMENT IN VIMARU, HAIPHONG

Item	Model	Quantity
1. NAVIGATION DEPARTMENT		
1-1 Radar room		
1-1-1 Donex	(U.S.S.R.)1965	2
1-1-2 Don	(U.S.S.R.)1969	1
1-1-3 Decca tm909	(England) old	1
1-1-4 Jma 510	(Japan) 1978	2
1-1-5 Furino 1940	(Japan) 1978	2
1-2 Navigation room		
1-2-1 Kodex navigation satellite system	Kodex old	1
1-2-2 Omega receiver jla-140	jrc 1981	1
1-2-3 Loran receiver jna-760	jrc 1981	1
1-2-4 Radio direction finder	kodex old	2
1-2-5 Kodex ks541	(Germany) old	1
1-2-6 Vef fg340	old	1
1-2-7 All wave receiver	(China) old	1
1-3 Electric equipment		
1-3-1 Echo sounder h715	(U.S.S.R.) 1965	2
1-3-2 Rft	(Germany) 1964	1
1-3-3 Speed log lgr 25	(U.S.S.R.) 1962	2
1-3-4 Auto pilot	(U.S.S.R.) 1965	1
1-3-5 Repeater compass	(U.S.S.R.) 1965	6
1-3-6 Magnetic compass	(U.S.S.R.) 1965	5
1-3-7 Gyro compass kypc 4	(U.S.S.R.) 1966	2
1-4 Communication		
1-4-1 Radio transceiver	(Poland) old	1
1-4-2 Facsimile receiver sax-229	(Japan) 1981	1
1-4-3 Vhf jhv-229	(Japan) 1981	1
1-4-4 Auto alarm receiver		1
1-4-5 Transceiver icom 700 ty	(Japan) 1987	2
1-5 Measuring equipment		
1-5-1 Oscilloscope 2 trace kikusui leader	(Japan) 1986	1
	(Japan) 1986	4
1-5-2 Frequency counter leader	(Japan) 1986	1
1-5-3 A.c. voltmeter	(Japan) 1986	1
1-5-4 C.c. ammeter	(Japan) 1986	1
1-5-5 Electronic voltmeter	(Japan) 1986	1
1-5-6 Am/fm standard generator	(Japan) 1986	1
1-5-7 Distortion meter	(Japan) 1986	1
1-5-8 Wow and flutter	(Japan) 1986	1
1-6 Practice of navigation and aid to navigation		
1-6-1 Sextant	(China) old	40
1-6-2 Chart	(U.S.S.R.) old	300
1-6-3 Navigation channel map	(U.S.S.R.) old	10
1-6-4 Nautical book	(U.S.S.R.) old	10
1-6-5 Chronometer	(U.S.S.R.) old	3
1-6-6 celestial globe model	(U.S.S.R.) old	1
1-7 Meteorology and international code signals		
1-7-1 Barometer (marine)	(U.S.S.R.) 1966	2
1-7-2 Hygrometer	(U.S.S.R.) 1966	1
1-7-3 Weather facsimile receiver	(Japan) 1981	1
1-7-4 Thermometer	(U.S.S.R.) old	1

	Item	Model	Quantity
	1-7-5 Hand signal flag		35
	1-7-6 Daylight signal light		2
	1-7-7 International signal flag with code and pole		3
1-8	Fire preventing and fire fighting appliance		
	1-8-1 Water pump	(U.S.S.R.) old	2
	1-8-2 Hose and nozzle	(U.S.S.R.) old	2
	1-8-3 Portable fire extinguisher	(U.S.S.R.) old	
	1-8-4 Protective clothing	(U.S.S.R.) old	2
1-9	Life saving apparatus		
	1-9-1 Life boat (40 persons)	-out of order-	
	1-9-2 Life jacket with lamp	(U.S.S.R.) old	20
	1-9-3 Life buoy	old	2
1-10	Training ship for maneuvering and handling		
2.	MARINE ENGINEERING DEPARTMENT		
	2-1-1 Diesel engine 6nyd-26	(Germany) 1968	1
	2-1-2 H.p. test apparatus	old	1
	2-1-3 Electric welding machine	(Poland) old	1
	2-1-4 Centrifugal pump (model)	(U.S.S.R.) old	3
	2-1-5 Piston pump (model)	(Germany) old	4
	2-1-6 Fuel injection valve tester	(U.S.S.R.) old	1
	2-1-7 Hand tachometer	(Germany) old	1
	2-1-8 Apparatus for power measure	(Germany) old	1
	2-1-9 Gear pump (model)		4
	2-1-10 Air compressor	(China) old	1
	2-1-11 Diesel engine (cut away model)	(U.S.S.R.) old	1
	2-1-12 Air reservoirs		2
	2-1-13 Turning machine	(Vietnam) old	2
	2-1-14 Driller (vertical)		1
	2-1-15 Reducing	(U.S.S.R.) old	2
	2-1-16 Diesel engine for overhauling	(Mitsubishi) old	1
3.	MARINE ELECTRIC, ELECTRONIC RADIO COMMUNICATION DEPARTMENT		
	3-1-1 Electric voltmeter, bm-310	1973	1
	3-1-2 Frequency generator, f341	1970	1
	3-1-3 Safety transformer	1973	1
	3-1-4 Electronic voltmeter	(Germany) 1972	1
	3-1-5 Resistance bridge, p316t	1970	1
	3-1-6 Milli-voltmeter	(Germany) 1972	1
	3-1-7 Anti (counter)-resistor	(U.S.S.R.) 1967	5
	3-1-8 Voltage stabilizer	(Japan) 1984	2
	3-1-9 Oscilloscope, lb510	1975	4
	3-1-10 Stand autopilot	(U.S.S.R.) 1970	1
	3-1-11 Electric motor (all kinds)	old	25
	3-1-12 Amplifier	(U.S.S.R.) 1972	5
	3-1-13 Magnetic starter	(U.S.S.R.) 1972	5
	3-1-14 AC generator	(Germany) 1970	2
	3-1-15 Electronic invector	(U.S.S.R.) 1972	2
	3-1-16 D.c. machine	(U.S.S.R.) 1970	2
	3-1-17 Voltmeter	(U.S.S.R.) 1968	2
	3-1-18 Ampere meter	(U.S.S.R.) 1966	5
	3-1-19 Frequency meter	(U.S.S.R.) 1972	5
	3-1-20 Three-phase transformer	(China) 1981	3
	3-1-21 Universal bridge	(Czech) 1970	2
	3-1-22 Megger	(Japan) 1983	2
	3-1-23 Auto-transformer	(China) 1970	5

(b) Measures To Be Taken

1) Replacement of educational and training equipment and machines and curriculum design of maritime schools in Vietnam

The present condition of equipment and machines of maritime schools in Vietnam do not meet the standards required under the SOLAS and STCW-78 and amended STCW-95 convention. Further, there is a lack of qualified seafarers suitable for modern ships with the present poor condition of equipment.

The study team recommends the replacement of educational and training equipment and machines used by of the maritime schools, which do not reflect the modern technology according to international standards. It also recommends implementation of a new curriculum, education and training program which actually adhere to standards based on the IMO course.

The school building and facilities of maritime schools (except for HCM MTTTS) are completely reconstructed, and installed with new equipment and machines for education and training. Replacement of the old and dilapidated equipment is important. For HCM MTTTS, considering the scheduled transfer of campus facilities in the near future, it is recommended that new equipment and machines must be installed upon completion of the construction of the new school building.

2) Upgrading of Skills of Instructors in Maritime Schools

It is essential that the education and practical training be supervised by fully qualified instructors who have adequate experience and appropriate qualifications for particular levels of training and education. However, only few of the staff in VIMARU were trained in the World Maritime University and related organizations in advanced countries. The study team recommends that maritime technical training courses be taken by instructors in more advanced countries to obtain adequate and advance maritime knowledge and technical skills.

2.3 Analysis of Supply of Seafarers

2.3.1 Definition of Competent Seafarers

(a) Qualification

In accordance with the international conventions, such as SOLAS, STCW-78/95 and MARPOL, and Vietnamese Maritime Code and other rules and regulations related to Vietnamese seafarers, the following qualification standards are prescribed:

- **Certificate of health**

- Certificate of Competency (Maritime Officer's Licenses or Qualification Certificate of Specialized Subject for Officers and Ratings)
- Documentary Evidence of Completion of Specialized Training Courses

(b) Technical Ability

Vietnamese shipping industry needs the following competent seafarers who have sufficient ability to operate modern ships equipped with advanced machineries and equipment as automatic and remote control system.

(c) Multi-Purpose Seafarers

The shipping industry's demand for seafarers with advanced technical knowledge to operate various types of ships (such as conventional ships, container ships, crude oil tankers, chemical tankers, and other specialized ships) is expected to increase in the future. These seafarers should be familiar with ships' manning scheme such as introduction of unmanned engine room system, dual function seafarers system, integrated navigation systems, among other. Some officers are requested to have dual-function licenses as qualified engineers and navigational officers. Some navigational officers are required to function as GMDSS radio personnel with the skill of General Operators Certificate (GOC). In order to upgrade Vietnamese seafarers, specialized courses can be organized in maritime schools in the future.

2.3.2 Demand Forecast

(a) Demand for Qualified Seafarers

The demand for seafarers must be analyzed to take account of the following:

- magnitude of fleet development in the country, both domestic and international,
- manning scale per ship with standard and minimum requirement, and
- reserve seafarers including seafarers scheduled for skills upgrading, training and re-education.

Further, it is essential to consider the following in estimating the demand for seafarers:

- 1) The seafarers should be able to engage in domestic, international and overseas shipping in work areas restricted by their own licenses and qualification certificates.

The ISM 1995 study noted that "The worldwide demand for and supply of seafarers," indicate a shortage of officers in 1995 of some 18,000 seafarers or about 4 %, and an annual number of 35,000 new seafarers should thus be trained to narrow the gap between the demand and supply of employment of seafarers up to year 2000. On the other hand, the total number of seafarers trained per year in the world is estimated to be about 25,000 seafarers.

- 2) Vietnamese seafarers share special arrangements such as lifetime employment with major shipping companies, and part-time employment with crew manning agents.

(b) Estimation of Demand for Seafarers

1) Estimated Number of Vietnamese Seafarers

Accurate data for Vietnamese seafarers is not available at present but VINAMARINE reported the number of seafarers in Vietnam in 1996 to be:

- 8,000 seafarers in Vietnam.
- number of officers including Master and Chief engineers is estimated at 1,800 engineers, and
- number of ratings is estimated at 6,200 seafarers/engineers.

The National Maritime Examination Board reported that the exact number of seafarers who passed the national maritime examination by rank and class are:

- 884 in year 1994 and
- 893 in year 1995.

They are entitled to obtain the designated certificate of competence either for initial maritime licenses or for skills upgrading. According to VIRES registry of sea going vessels in year 1996, the total number of registered ships is 591 which include cargo ships, oil tankers, passenger ships, and likewise ships for fishing, tug, patrol, barge, etc. Vietnamese seafarers can be categorized into four according to their maritime certificate. The number of seafarer registered ships for each category is shown in Table 2.3.1.

Table 2.3.1
CATEGORY OF SEAFARERS AND NUMBER OF REGISTERED SHIPS
(VIRES in 1996)

		Category 1	Category 2	Category 3	Category 4
Voyage area		World wide	Limited sea going	Coastal	Near coastal
Ship size		Over 1,600 GRT	201 - 1,600 GRT	50 - 200 GRT	Below 50 GRT
Main Propulsion Machinery		Over 3,000 KW	751 - 3,000 KW	75 - 750 KW	Below 75 KW
Certificate of officers		Class 1	Class 2	Class 3	Class 4
Number of ships registered		58	334	192	7
Standard manning scale	Officers	12	9	7	4
	Ratings	17	14	11	6
	Total	29	23	18	10

Due to the lack of statistical data for seafarers administration in the country, the Study Team estimated the present number of Vietnamese seafarers based on the number of VIRES registered ships as shown in Table 2.3.1 above. With a standard manning

requirement for each ship category, the total number of Vietnamese seafarers is as follows:

- total number is 12,890 employed in fishing, tug, barge and other types of ships,
- total number of Vietnamese seafarers is 13,500 which include reserved seafarers

a) Shipping industry, international:	4,000
domestic:	4,000
overseas employers:	1,000
total:	9,000
b) fishing, tug, barge and other ships:	4,500

2) Future Demand for Vietnamese Seafarers Required by the Shipping Industry

According to the maritime transport development policy prepared by MOT, the present maritime fleet of 800,000 DWT will be increased to 2 million DWT by the year 2000, and 11 M - 20 MDWT by the year 2010 - 2020. An annual demand for Vietnamese seafarers is estimated and presented in Tables 2.3.2 and 2.3.3

Table 2.3.2
ANNUAL DEMAND FOR VIETNAMESE SEAFARERS IN YEAR 2000

Ships Category/ Seafarers		Officers				Ratings	
		Class 1	Class 2	Class 3	Class 4	Deck/Eng	Catering
Ship category 1	under 10 years	720				780	240
	over 10 years	825				894	275
	foreign	80				500	40
Ship category 2	under 10 years		281			375	63
	over 10 years		1,046			1,395	233
	foreign		320			500	40
Ship category 3	under 10 years			189		243	51
	over 10 years			476		612	136
	foreign			-		-	-
Ship category 4	under 10 years				332	498	0
	over 10 years				816	1,224	0
	foreign				-	-	-
Total	Group A	800	601	189		2,398	
	Group B	825	1,046	476	1,148	4,623	1,078
	Total	1,625	1,647	665	1,148	7,021	1,078

Table 2.3.3
ANNUAL DEMAND FOR VIETNAMESE SEAFARERS IN YEAR 2005

Ships Category/ Seafarers		Officers				Ratings	
		Class 1	Class 2	Class 3	Class 4	Deck/Eng	Catering
Ship category 1	under 10 years	1,335				1,446	445
	over 10 years	750				813	250
	foreign	100				800	60
Ship category 2	under 10 years		1,046			1,395	233
	over 10 years		878			1,170	195
	foreign		500			800	60
Ship category 3	under 10 years			411		567	126
	over 10 years			399		513	114
	foreign					-	-
Ship category 4	under 10 years				516	774	0
	over 10 years				668	1,002	0
	foreign				-	-	-
Total	Group A	1,435	1,546	441	0	5,008	0
	Group B	750	878	399	1,184	4,272	1,483
	Total	2,185	2,424	840	1,184	9,280	1,483

Remarks: Group A: Total number of seafarers for ship categories 1, 2 and 3 under 10 years in year 2000 and under 15 years in year 2005 and for foreign ships;
Group B: Total number of seafarers for other ships

Furthermore, the annual growth of demand for Vietnamese seafarers is presented in Tables 2.3.4 and 2.3.5.

Table 2.3.4
ANNUAL GROWTH OF DEMAND FOR VIETNAMESE
SEAFARERS IN YEAR 2000

Annual Demand/ Seafarers		Officers				Ratings	
		Class 1	Class 2	Class 3	Class 4	Deck/Eng	Catering
Annual growth of demand	Group A	127	189	50	0	522	0
	Group B	-15	-34	-15	7	-70	81
Annual replacement (8%)	Group A	64	48	15	0	192	0
	Group B	66	84	38	92	370	86
Annual demand	Group A	191	237	65	0	714	0
	Group B	51	50	23	99	300	167
Demand in 2000	Total	242	287	88	99	1,014	167

Table 2.3.5
ANNUAL GROWTH OF DEMAND FOR VIETNAMESE
SEAFARERS IN YEAR 2005

Annual Demand/ Seafarers		Officers				Ratings		
		Class 1	Class 2	Class 3	Class 4	Deck/Eng	Catering	
Annual growth of demand	Group A	127	189	50	0	522	0	
	Group B	-15	-34	-15	7	-70	81	
Annual replacement (8%)	Group A	115	124	35	0	401	0	
	Group B	60	70	32	95	342	119	
Annual demand	Group A	242	313	85	0	923	0	
	Group B	45	36	17	102	272	199	
Demand in 2000		Total	287	349	102	102	1,195	199

Remarks: Group A: Total number of seafarers for ship categories 1,2 and 3 under 10 years in year 2000 and under 15 years in year 2005 and for foreign ships
Group B: Total number of seafarers for other ships

Future demand for Vietnamese seafarers in terms of their number in the years 2000 and 2005 is estimated in Table 2.3.6.

Table 2.3.6
FUTURE DEMAND FOR VIETNAMESE SEAFARERS IN YEARS 2000-2005

		Officers					Ratings			Grand Total
		Class 1	Class 2	Class 3	Class 4	Total	Deck/Eng	Catering	Total	
Year 2000	Group A	800	601	189		1,590	2,398		2,398	3,988
	Group B	825	1,046	476	1,148	3,495	4,623	1,078	5,701	9,196
	Total	1,625	1,647	665	1,148	5,085	7,021	1,078	8,099	13,184
Growth of demand in year 2000	Group A	191	237	65	0	493	714	0	714	1,207
	Group B	51	50	23	99	223	300	167	467	690
	Total	242	287	88	99	716	1,014	167	1,181	1,897
Year 2005	Group A	1,435	1,546	441	0	3,422	5,008	0	5,008	8,430
	Group B	750	878	399	1,184	3,211	4,272	1,483	5,755	8,966
	Total	2,185	2,424	840	1,184	6,633	9,280	1,483	10,763	17,396
Growth of demand in year 2005	Group A	242	313	85	0	640	923	0	923	1,563
	Group B	45	36	17	102	200	272	199	471	671
	Total	287	349	102	102	840	1,195	199	1,394	2,234

2.3.3 Supply of Seafarers

(a) Annual Supply of Vietnamese Seafarers

The annual supply of Vietnamese seafarers in terms of the number who graduated from Vietnamese maritime schools is shown in Table 2.3.7.

Table 2.3.7
ANNUAL SUPPLY OF VIETNAMESE SEAFARERS

Maritime Schools/ License		Officers				Ratings	
		Class 1	Class 2	Class 3	Class 4	Deck/Eng	Catering
VIMARU (Haiphong)	Pre-sea *a	100	200			(300)	
	Upgrade *b	100	(-100)				
	Upgrade *b		100	(-100)			
	Refresher *c	(40)	(100)			(400)	
VIMARU (H.C.M. City)	Pre-sea *a	30	70			(200)	
	Upgrade *b	50	(-50)				
	Upgrade *b		(50)	(-50)			
	Refresher *c	(40)	(40)			(280)	
MTTS No. 1 (Haiphong)	Pre-sea					400	70
	Upgrade *b			70	(-70)		
	Upgrade *b				165	(-165)	
	Refresher			(100)	(120)	(500)	(150)
H.C.M. City MTTS (H.C.M. City)	Pre-sea					300	60
	Upgrade *b			30	(-30)		
	Upgrade *b				55	(-55)	
	Refresher *c			(50)	(60)	(350)	(120)
Total annual supply		280	270	-50	120	480	130

Remarks:

- *a: Graduates from pre-on board training at VIMARU will start to work as ratings or cadets in order to have the required sea service experience upgrading to obtain maritime licenses (they are classified as class 1 and class 2 officers).
- *b: Trainees of skills upgrading course will increase the number of officers but will not increase the number of seafarers.
- *c: Refresher training course will improve the seamen's skills but will not increase the number of seafarers.

As indicated in Table 2.3.7, the annual average supply of Vietnamese seafarers is around 620 officers and 610 ratings.

VIMARU and MTTSs both have courses on basic training, skills upgrading, and refresher training. The basic (pre-apprentice) training courses will increase the number of seafarers, but the skills upgrading training and refresher training courses will only

educate existing seafarers to prepare them for higher position but will not increase the total number of seafarers.

(b) Analysis of Demand and Supply Gap

Based on the comparison of projected annual demand and the supply of Vietnamese seafarers, as presented in Tables 2.3.6 and 2.3.7., the gap on the number of Vietnamese seafarers by officer type is analyzed as follows:

1) Class 1 Officers

The demand and supply will be equal in terms of the total number of officers for Class 1. However, the number of seafarers in Group B who are suited for old ships but not suited for modern ships will exceed the demand while in group A (i.e. those who are suited for modern and foreign ships) will have shortage in supply.

2) Class 2 Officers

The demand and supply will be equal in terms of total number until the year 2000, but there will be a shortage after. Group B will have an over supply, while there will be shortage of seafarers belonging to Group A (i.e. those who are suited to modern and foreign vessels).

3) Class 3 Officers

It is expected that there will be a shortage in the supply in the total number of seafarers for all groups.

4) Class 4 Officers

The demand and supply will remain equal in terms of the total number in the years 2000 and 2005.

5) Ratings

There is a shortage of supply in the total number of ratings, particularly the seafarers suited for modern and foreign vessels.

(c) "Supply Plan" of Seafarers for Shipping Industry

1) Supply of Seafarers

The existing maritime schools, VIMARU Haiphong and the branch in Ho Chi Minh City, MTTTS No. 1 Haiphong and HCM MTTTS have the capability to supply the number of seafarers to meet the demand of up to 13,184 seafarers in year 2000 and 17,396 seafarers in year 2005.

2) Supply of Competent Seafarers

The Vietnamese shipping industry shall expand its present fleet to meet the cargo transport demand efficiently. With the replacement of old ships by newly built or

purchased from foreign countries, the demand for seafarers who can operate these modern ships safely and efficiently will increase.

In order to supply competent seafarers for the Vietnamese shipping industry, it is essential to implement the following countermeasures the soonest possible time:

- Improvement and upgrading of equipment and machines for education and training at maritime schools.
- Upgrading of skills of instructors of maritime schools in the use of modern equipment and machines.
- Improvement of practical training program using simulator-based training in maritime schools.
- Students and new graduates of maritime schools can obtain advanced maritime technology from on-board practical training course. The Study Team recommends that the training cadets take OJT on-board modern ships equipped with advanced technologies under the close supervision of qualified officers on-board.
- New graduates of maritime schools shall get specialized maritime technical abilities with OJT on-board foreign ships such as the Very Large Crude Oil Carrier, Chemical Tanker, Liquefied Gas Carrier before being employed by the national shipping industry.

Chapter 3 Proposed Improvements

3.1 Improvement of Seafarers' Education and Training

Seafarers education and training must be developed to meet both national and international requirements. The proposed plan to improve seafarers education and training are based on the Study Team's objectives for developing of the Coastal Shipping Master Plan, which are summarized as follows:

- Supply of competent seafarers in accordance with the demand of both coastal and overseas shipping,
- Promotion of safety of life at sea and property, and the protection of the marine environment,
- Fulfillment of the requirements provided in the international conventions such as SOLAS, MARPOL and STCW-78/95, and
- Development of maritime human resources which comprise not only of seafarers but also the maritime personnel presently employed in shipping industries and maritime related activities.

The above objectives are in accordance with the government's policy, "The Human Resource Strategy" for national success and "Upgrading the Quality of Education" to meet the demand of the country's industrialization and modernization programs.

3.1.1 Improvement Plan of VIMARU

(a) Upgrading Equipment for Maritime Education and Training

In order to comply with the requirements of the international conventions, the old equipment for maritime education and training at VIMARU must be replaced with modern equipment which fully comply with international performance standards. Further, education and training at VIMARU must be designed according to technical demands required by both national and foreign shipping companies so that the graduates of VIMARU can become qualified seafarers.

- 1) The proposed equipment for education and training by VIMARU, Haiphong is shown in Figure 3.1.1.

Figure 3.1.1
**LIST OF PROPOSED EQUIPMENT FOR EDUCATION AND TRAINING BY
VIETNAM MARITIME UNIVERSITY (VIMARU)**

<ITEM>	<QUANTITY>
Navigation Department	
1. Radar simulator with automatic radar plotting aid (ARPA-RADAR)	1 set
2. Practice of navigation (Celestial Observation)	
2-1 Astronomical calculation set	30
2-2 Mini planetarium with dome	1
3. Gyro compass training set	1
4. Fire prevention and fire fighting appliances	
4-1 Fire fighting equipment for practical training (water pump, hose and nozzle, portable fire extinguisher, etc.)	1 set
4-2 Fire detecting and alarm system	
4-3 Fireman's outfit consisting of self-contained breathing apparatus, protective clothing, etc.	5 sets
4-4 Sprinkler head (automatic and manual type)	3 each
4-5 Oxygen monitor	3
4-6 Combustible gas detector	2
4-7 CO monitor	1
4-8 Tank scope gas detector	1
4-9 Multi gas detector	1
5. Life saving apparatus	
5-1 Life raft with container without gas re-charge device	2
5-2 Life jacket with lamp	30
5-3 Buoyant apparatus	1
5-4 Life buoy with life line (30m) and self-ignite light	6
5-5 Life line throwing appliance	2
6. Loading calculator for stability training	1
Marine Engineering Department	
7. Diesel engine plant	1 set
8. Bilge separation mini-process model (with oil detection method)	1
9. Electrical and electronic equipment and installations	
9-1 DC stabilizer power supply	2
9-2 Various types of motors	1 set
9-3 Voltage regulator	3
9-4 Bridge (Wheat stone bridge)	2
9-5 Electronics experimental equipment	1
10. Work shop machinery	
10-1 Universal machine (combined with lathe, shaper, milling and drilling)	1 set
10-2 Gas welder (with cutter)	1 set
10-3 Lathe machine (center distance: abt. 1.400 mm)	1

10-4	Milling machine (working surface: abt. 1,100 x 250 mm)	1
10-5	Cutting machine (cutter dia.: abt. 400 mm)	1
10-6	Grinding machine (stone dia.: abt. 250 mm)	1
10-7	Lapping machine (for exhaust valve)	1
10-8	Electric grinder (portable)	1
10-9	Electric drill	1
11.	Testing and measuring equipment (Engine department)	
11-1	Hardness testing machine (4 kinds)	1 set
11-2	Gear tester	1
11-3	Surface roughness tester	1
11-4	Non destructive tester	1
11-5	Water calorimeter	1
11-6	Boiler water test kit (2 kinds)	1 set
11-7	Gas analyzer (2 kinds)	1 set
11-8	Fuel oil analyzing kit (11 kinds)	1 set
11-9	Micrometer	1 set
11-10	Dial gauge with magnet base	2
11-11	Flow meter (2 kinds)	1 set
11-12	Vibration meter (portable type)	1
11-13	Sound level meter (portable type)	1
11-14	Fuel injection valve tester	1
11-15	M/E combustion analyzer (portable type)	1
11-16	Torsion meter	1
Electric, Electronic Radio Communication Department		
12.	Testing and measuring equipment	
12-1	Circuit tester	10
12-2	Watt meter	5
12-3	Frequency meter	5
12-4	Galvanometer	2
12-5	Gauss meter	5
12-6	Oscilloscope (2-input, 2-phenomena logical type)	5
12-7	Power factor meter	2
12-8	Stroboscope	2
12-9	Tachometer (photo-electric)	2
12-10	Hand tachometer	2
12-11	Illuminometer	2
12-12	Digital frequency meter	2
12-13	Dial type (bimetal) thermometer	2
12-14	Thermometer with electric contact	2
12-15	Indicating Thermometer	2
13	Offset printing machine	2
14.	Radio communication and GMDSS Trainer	1 set
	<Instructor's position>	
14-1	MF/HF radio training unit (simulator)	
	1- MF/HF controller	
	1- Data terminal	
	1- Printer	
14-2	VHF radio training unit	1 set
	1- VHF radio telephone	
	1- DSC watch receiver	
	1- Printer	
	1- Dummy antenna	
14-3	Inmarsat-B signal generator	1 set
14-4	Inmarsat-C signal generator	1 set
14-5	Two-way VHF radiotelephone	1 set
14-6	Cassette type recorder for NAVTEX	1 set

14-7	Chair, table and locker <Student's position No. 1>	I set each
14-8	MF/HF controller 1- MF/HF controller 1- Data terminal 1- Printer	

In accordance with the requirements of international convention STCW-78/95, it is urgently required to install the equipment at VIMARU, as presented in Figure 3.1.2.

Figure 3.1.2
LIST OF PROPOSED PRIORITY EQUIPMENT AT VIMARU

- | | |
|----|---|
| 1. | RADAR ARPA Simulator (4 own ship cubicles = at least 2 own ship cubicles) including supporting equipment such as XY plotter for assessment
*Each own ship must have the following parts: |
| 1) | Radar ARPA display |
| 2) | Gyro compass repeater |
| 3) | Rudder angle and Rate turn indicator |
| 4) | Speed Log Indicator |
| 5) | Engine control telegraph |
| 6) | Main engine RPM indicator |
| 7) | Ship's time display |
| 8) | Wind (Speed and direction) indicator |
| 9) | Depth of water (Echo sounder) indicator |
| 2. | GMDSS Simulator |
| 1) | VHF Radio |
| 2) | SART (Search and Rescue Transponders) |
| 3) | NAVTEX Receiver |
| 4) | IMMARSAT EGC Receiver |
| 5) | 406 Mhz / 16 Ghz EPIRB |
| 6) | 2182 Khz Watch Keeping Receiver |
| 3. | Diesel Engine Plant with Auxiliary Machines or Engine room Simulator System |
| 4. | Testing Equipment |
| 1) | Plate Thickness Testing Machine |
| 2) | Material Tension Testing Machine |
| 3) | Weld Checking Machine |
| 5. | Software aids for ship designing |

- 2) The proposed equipment for education and training by VIMARU, Ho Chi Minh City is shown in Fig. 3.1.3.

Figure 3.1.3

**LIST OF PROPOSED EQUIPMENT FOR EDUCATION AND TRAINING
BY VIMARU BRANCH, HO CHI MINH BRANCH**

1.	Radar navigation	
1-1	Radar simulator, with Automatic Radar Plotting Aid (ARPA)	1 set
2.	Electronic systems of fixing position, echo sounders and communication	
2-1	Electronic Navigation Aides Simulator including LORAN-C receiver DECCA navigation NASS GPS Navigation Radio direction finder Echo sounder	1 set
2-2	GMDSS and Radio Communication Training Unit including INMARSAT system	1 set
3.	Diesel Engine Plant with Auxiliary Machines or Engine Room Simulator System	1 set
4.	Compasses - magnetic and gyro	1 set
4-1	Magnetic compass training set	1 set
4-2	Gyro compass training set	1 set
4-3	Gyro scope	
5.	Oil and gas laboratory	1 unit

(b) Technical Cooperation by an Advanced Country

The International Convention STCW-78 stipulates the promotion of Technical Cooperation by advanced with the assistance of the International Maritime Organization (IMO), to support for those countries which request for technical assistance in the following:

- training of administrative and technical personnel;
- establishment of institutions for the training of seafarers;
- supply of equipment and facilities for training institutions;
- development of adequate training programs, including practical training on-board seagoing ships; and
- facilitation of measures to enhance technical capability of seafarers.

For example, the Japanese government and the organizations concerned have undertaken the following technical assistance programs in Vietnam.

- Group training of administrative and technical personnel; and
- Seafarers training including practical training on-board seagoing ships

In addition to the above-mentioned technical assistance, VIMARU has requested the following assistance:

- A Technical Cooperation by providing a Navigational expert and a Marine Engineering expert to survey the present status and condition of VIMARU and examine the Development Plan of VIMARU;
- Upgrading of facilities at VIMARU Haiphong thru a grant of a foreign country with an advanced maritime sector;
- Technical cooperation to VIMARU Branch in Ho Chi Minh City.

The study team therefore recommends that a Navigational expert and a Marine Engineering expert be provided to survey the present condition of VIMARU and its Branch in Ho Chi Minh City. Further, they shall examine the Development Plan prepared by VIMARU to formulate an effective assistance scheme to the university as soon as possible.

3.1.2 Improvement Plan of MTTS No. 1 and HCM City MTTS

(a) Supply of Equipment

Those Maritime Technical and Training Schools have difficulties in supplying qualified seafarers to meet the requirements of the International Convention STCW-78 and Revised Convention STCW-95 because of the poor condition of equipment and facilities compared with the required performance standards. It is also very difficult to supply seafarers suitable for modern ships, who are properly educated and trained with modern equipment.

In order to educate and train seafarers at least to international standard levels as required by the International Convention STCW-78 and Revised Convention STCW-95 to supply seafarers to ships with modern technical equipment, a project proposal for a grant by an advanced country to fund the urgent improvement of MTTS No. 1 and HCM, and the provision of required equipment.

The Study Team recommends to study the required equipment, the education system and the present training program and the curricula by a maritime education expert, and prepare a priority list of required equipment considering the following:

- The present curricula was introduced in 1992 and must be amended according to what the international conventions prescribed.
- The training program must be reviewed considering the recommendation of the international convention STCW-78 and revised STCW-95 for the use of various simulation systems, and the effective use of modern equipment and machines.

The list of proposed equipment for education and training by MTTs No. 1 and HCM, MTTs is shown in Figure 3.1.4.

Figure 3.1.4
**LIST OF PROPOSED EQUIPMENT FOR EDUCATION AND TRAINING
BY MARITIME TECHNICAL AND TRAINING SCHOOL**

		MTTS No. 1	HCM-MTTS
I.	Navigation Aid Equipment		
1-1	Steering Trainer	1 set	1 set
1-2	Gyro Compass Trainer	1	1
1-3	Magnetic Compass Trainer	1	1
1-4	Radar Simulator	1	1
1-5	Engine Telegraph	1	1
1-6	Communication Equipment		
	1) MF/HF Radio Trainer (1 instructor stn. with 5 student stn.)	1	1
	2) VHF Radiotelephone trainer (1 instructor stn. with 1 student stn.)	3	3
	3) VHF 2-way radiotelephone with battery charger	3	3
	4) NAVTEX receiver	1	1
1-7	Meteorology Equipment		
	1) Marine Aneroid Barometer	1	1
	2) Thermometer	1	1
	3) Hydrometer	1	1
	4) Water temperature meter	1	1
	5) Weather facsimile receiver	1	1
	6) Current distribution chart	1	1
	7) Cloud and meteorological symbols	1	1
	8) Wind vane anemometer	1	1
1-8	Others		
	1) Radar plotting	5	5
	2) Stop watch	5	5
	3) Chronometer	1	1
	4) Sextant	5	5
	5) Catalogue of chart and hydrographic publications 1		1
	6) Wall Chart		
	a. Auto pilot system	1	1
	b. Electro-magnetic speed log	1	1
	c. Magnetic compass	1	1

	d. Gyro compass	1	1
	e. Echo sounder	1	1
	f. Doppler log	1	1
	g. Radar	1	1
	h. Loran C	1	1
	i. GPS (Global Position System)	1	1
	j. Radio direction finder	1	1
	k. Navigation aids	1	1
2.	Survival Training Equipment		
2-1	Inflatable Life raft		
	1) Life raft (6 persons)	1	1
	2) Life raft (10 persons)	1	1
	3) Blower for air extraction	1	1
2-2	Life Boat and Davit		
	1) Life boat (open type)	1	1
	2) Life boat (davit)	1	1
2-3	Life Jacket		
	1) Ordinary type	20	20
	2) Inflatable type	20	20
2-4	Life buoy	1	1
2-5	Distress Communication Equipment		
	1) Satellite EPIRB	1	1
	2) Radar transponder	1	1
2-6	First Aid		
	1) Stretcher	1	1
	2) Basket stretcher	1	1
	3) Resuscitation demonstration kit	1	1
3.	Fire Fighting Equipment		
3-1	Fire Fighting Equipment		
	1) Portable fire pump	1	1
	2) Breathing apparatus	5	5
	3) Protective clothing	5	5
	4) Fire hose		
	a. Coated canvas hose 1.5"	10	10
	b. Coated canvas hose 2.5"	2	2
	5) Nozzle		
	a. Nozzle 1.5"	2	2
	b. Nozzle 2.5"	2	2
	6) Wall chart		
	a. Fixed gas fire extinguishing system	1	1
	b. Fixed foam fire extinguishing system	1	1
	c. Fixed water-spray fire extinguishing system	1	1
	d. Automatic sprinkler	1	1
	7) Portable fire extinguisher		
	a. Foam type	6	6
	b. Co type	6	6

	c. Dry type	2	2
	8) Fireman's outfits	2	2
	9) Air compressor for breathing apparatus	1	1
4.	Deck Department Equipment		
4-1	Ship chandler		
	1) Cremona	Various	Various
	2) Steel wire rope	Various	Various
	3) Vinyl on Canvas	Various	Various
	4) Signal light (Portable type daylight)	2 sets	2sets
	5) Lantern	Various	Various
	6) International signal		
	a. International signal flag	1	1
	b. Hand signal flag	1	1
	7) Various kinds of shackles and other rigging equipment	1	1
	8) Rope work apparatus	1	1
4-2	Pilot ladder and Side ladder	1	1
		set each	set each
5.	Engine Department Equipment		
5-1	Diesel Generating plant		
	1) Diesel generating engine	2	2
	2) Electric generator	2	2
	3) Electric switchboard	1	1
5-2	Refrigerating Unit	1	1
5-3	Workshop Equipment		
	1) Lathe (550 mm)	3	3
	2) Universal machine (1,000 mm)	1	1
	3) DC arc welder (engine driven 170 A)	1	1
	4) Tool grinder	1	1
	5) Electric AC welder	2	2
	6) Gas welder/citter with appurtenance	2	2
	7) Drilling machine (fixed/portable type)	1	1
	8) Hack saw machine	1	1
	9) Disk sander	1	1
	10) Blower	1	1
	11) Portable steel screens	5	5
	12) Welder's outfit	1	1
5-4	Testing and Measuring Equipment (Machinery part)		
	1) Pressure gauge for air, oil and hydraulic	1	1
	2) Dial gauge	1	1
	3) Micrometer	1	1
	4) Block gauge	1	1
	(Electric part)		
	1) Circuit tester	1	1

	2) Volt and ammeter	Various kinds	1	1
	3) Hand tachometer		1	1
	4) Electric experimental tool		1	1
	5) Sample of electric cable		1	1
	6) Main engine remote control trainer		1	1
	7) Wall chart for control valve cross section		Various	Various
5-7	Electric Training Equipment			
	1) Basic electric/electronic Circuit		1	1
	2) Measuring equipment			
	a. Oscilloscope		5	5
	b. Digital circuit tester		5	5
	c. DC ammeter (3 kinds of full scale range)	5		5
	d. AC voltmeter		5	5
	e. Electronic voltmeter		5	5
	f. Single generator		5	5
5-8	Engine part Cut-Away Model			
	1) Cut-way model			
	a. Reciprocating pump		1	1
	b. Centrifugal pump		1	1
	c. Gear pump		1	1
	d. Screw pump		1	1
6.	Other Equipment			
6-1	Audio-visual Instruction Aids			
	1) Television set		1	1
	2) V.C.R. (VHS)		1	1
	3) Video Program (VHS English)		1	1
	4) OHP		1	1
	5) Blank sheet		100	100
			sheets	sheets
	6) Slide Projector		1 set	1 set
6-2	Language Laboratory		1	1
6-3	Computer			
	1) Personal Computer with application software of word processor		1	1
	2) Printer		1	1
6-4	Others			
	1) Mini bus (12-seatch)		1	1
	2) Pick-up truck (2 tons)		1	1

(b) Technical Cooperation Grant by an Advanced Country

Considering that the instructors of MTTSS have no opportunity to be trained in the World Maritime University or other organizations in advanced countries, it is very difficult for them :

- to harmonize with the international standards of maritime education and training;
- to develop adequate training programs, including practical training on-board seagoing ship; and
- to facilitate measures and arrangements to enhance the qualifications of seafarers.

The Study Team recommends the following technical cooperation to the MTTSSs.

- 1) The instructors of MTTSSs in both deck and engine departments should attend training course and visit maritime institutions in any advanced country to study:
 - maritime education and training management,
 - curriculum design, and training program based on the international convention requirements,
 - implementation of various simulation systems for practical training, and
 - use of the simulators and modern equipment for effective maritime education and training.
- 2) The navigation expert and marine engineering expert of a maritime advanced country should study further:
 - the present condition and status of facilities and equipment,
 - the curricula and training program,
 - actual practice and class lectures
 - capability of the instructors and the experts to study and implement the development plan of MTTSSs.

3.2 Proposed Improvement of Seafarers Administration

3.2.1 Certification System

(a) Classification on Certificate of Competency and Rank Assignment

Vietnamese certificates of competency for navigational officers and marine engineers are classified into four ranks such as Master, chief officer, second officer and third officer for navigational officer; and chief engineer, first engineer, second engineer and third engineer for marine engineer (in the first class, second class and third class) as well as any position on-board the ship. The fourth class certificate of competency is classified into two ranks: Master and chief officer for navigational officer; and chief engineer and first engineer for marine engineer as well as any position on-board the ship. Vietnamese classification on certificate of competency and rank assignment is shown in Tables 3.2.1 and 3.2.2.

Table 3.2.1
CLASSIFICATION ON VIETNAMESE CERTIFICATE OF COMPETENCY AND
RANK ASSIGNMENT IN GRADE FIRST/SECOND/THIRD CLASS

Certificate of competency	Rank assignment on board
Master/chief engineer	Master/chief engineer
chief officer/first engineer	chief officer/first engineer
second officer/second engineer	second officer/second engineer
third officer/third engineer	third officer/third engineer

Table 3.2.2
CLASSIFICATION OF VIETNAMESE CERTIFICATE OF COMPETENCY AND
RANK ASSIGNMENT IN GRADE FOURTH CLASS

Certificate of competency	Rank assignment on board
Master/chief engineer	Master/chief engineer
chief officer/first engineer	chief officer/first engineer

The International Convention STCW-95 stipulates the classification of the certificate of competency in Chapter 2 for Master and Deck Department, and Chapter 3 for Engine Department that:

For Masters and Navigational Officers

- Master and chief officer on ships of 3,000 gross tonnage or more
- Master and chief officer on ships between 500 and 3,000 gross tonnage
- Masters and officers in charge of a navigational watch on ships of less than 500 gross tonnage
- Officer in charge a navigational watch serving on a seagoing ship of 500 gross tonnage or more

For Maritime Engineers

- Officers in charge of an engineering team in a manned engine room or designated duty engineers on a periodic basis in unmanned engine room
- Chief engineer officers and second engineer officers of ships powered by main propulsion machinery of 3,000 kw or more propulsion power
- Chief engineer officers and second engineer officers of ships powered by main propulsion machinery between 750 kw and 3,000 kw propulsion power

Further, based on the regulation of the amended STCW-95, mandatory minimum requirements of ratings form part of manning an engine room or designated to perform duties in a periodic manner (if engine rood is unmanned). Thus, mandatory minimum

requirements of rating that should form part of a navigational watch must be introduced in the certification system in Vietnam.

Likewise, based on international classification standards the certificate of competency is classified into three ranks and the rank assignment is classified into four ranks. Therefore, the third grade of the certificate of competency must be qualified for the position on-board as second officer and third officer for navigational officer, and second engineer and third engineer for marine engineer. The international standard of classification of certificate of competency and rank assignment is shown in Table 3.2.3

**Table 3.2.3
INTERNATIONAL STANDARD OF CLASSIFICATION ON CERTIFICATE OF
COMPETENCY AND RANK ASSIGNMENT**

Certificate of competency	Rank assignment on board
first grade	Master/chief engineer
second grade	chief officer/first engineer
third grade	second officer and third officer/ third engineer and third engineer

Vietnamese seafarers are obliged to have longer period of training required to upgrade the maritime certificate of competency compared to other countries. The Study Team recommends to amend the classification of certificate of competency and rank assignment as shown in Table 3.2.4.

**Table 3.2.4
RECOMMENDED CLASSIFICATION ON CERTIFICATE OF
COMPETENCY AND RANK ASSIGNMENT**

Certificate of competency	Rank assignment on board
Master/chief engineer (or first grade)	Master/chief engineer
Senior officer (or second grade)	Chief officer/first engineer
Junior officer (or third grade)	Second officer/second engineer third officer/third engineer

With the amendment of certification system in Vietnam, the national maritime examination for second officer and third officer for navigational officers, and second engineer and third engineer for marine engineer will be combined with the national maritime examination for junior navigational officer and junior marine engineer (or third grade of officer and engineer).

(b) Required Career for Maritime Certification

1) Importance of Career for Maritime Certification

The required career for maritime certification is regulated in the "Rules on Examination, Certification and Rank Assignment for Seafarers Working On-board Vietnamese Ships." The practical training is essential to have maritime technical ability and it is required to get practical training on-board to comply with the mandatory minimum requirements for the certification of maritime officers.

The international convention STCW-78/95 stipulates that the practical training be undertaken in accordance with approved training program. The candidates for certification of maritime officers are required to have approved seagoing service experience of not less than three years.

2) Systematic Practical Training

The international convention STCW-78/95 also stipulates that the required period of practical training for the initial maritime officer's certificate is shortened from three years to one year if on-board training experience is found to be adequate and candidates receive :

- systematic practical training and experiences which are closely supervised and monitored by qualified officers, and
- adequate documents in an approved Training Record Book
- required career for maritime certification

The "Rules on Examination, Certification and Rank Assignment for Seafarers working on-board Vietnamese ships" stipulate the required career for maritime certification as shown in Figures 1-4-3 and 1-4-4.

With an effective use of equipment for education and training such as simulator in the future, the required period for the sea service on-board must be reviewed and shortened in accordance with the international convention STCW-78/95.

3.2.2 Other Administrative Matters

(a) Seafarer Database System

VINAMARINE administers the various affairs of seafarers such as education and training, issuance of seaman passport, registration card and certificate of competency. However, accurate data on seafarers is not available due to the lack of systematic updating of database system.

As indicated in Section 1.1.2 (c) of this Report, the seafarers' database system must be established for routine administrative works and for future planning. It is impossible to formulate an effective and appropriate development plan for seafarers, if the data is not complete (on non-existent in some cases) as to the current situation of the shipping industry, maritime institutes and certification for STCW competency data which include the existing number of seafarers.

It is recommended that a database system on seafarers be institutionalized which is linked with the database of VINAMARINE in the future, which include:

- 1) Shipping company's data including seafarers' condition of:
 - Number of seafarers by rank and country, and by certificate of competency; and
 - Each seafarer's period of on-board service, and present working situation
- 2) Maritime school data for number of graduates in each department;
- 3) License and certification for STCW competency data;

It is likewise very important to update the above data every regular reporting period.

(b) Minimum Manning for Each Ship

The manning scale of Vietnamese ships is reported in Tables 2.1.2 (a) and 2.1.1. In connection with the modernization of Vietnamese fleet and upgrading skills of Vietnamese seafarers, the present manning requirements for Vietnamese ships should be reviewed so that the Vietnamese can be operated safely and efficiently under normal working conditions with reliable seafarers. Also, under the international safety standard of manning, the "Minimum Manning Certificate" must be issued.