

Chapter 4 Short Term Plan

4.1 Supply Plan

4.1.1 Expected Seafarers

(a) Modernization of Maritime Technology

Since the remote control system became useful on-board ships, the maritime technology made it possible to control, check, verify and monitor the operation systems of ships from the bridge or control rooms, and that an engine room system unmanned became possible.

Modern technology was adopted by the shipping industry, and the technical developments were introduced on navigational equipment such as electronic and satellite navigation systems, cargo handling systems, machinery control systems radio telegraphy and communication systems. The ships became larger and more sophisticated through time.

(b) Safe and Efficient Operation of the Ships

It is required that the ships operate safely and efficiently since once a maritime casualty happens, tremendous damage will result not only to the ship itself but also on property and pollution to marine environment. It is noted that most maritime accidents are caused by human error.

In order to ensure the safe operation of different types of ships and the prevention of maritime casualties, the IMO recognized technical standard for worldwide seafarers, the standardization of construction and equipment of ships and rule and regulation of ship operation by the international convention such as SOLAS, STCW-78/95, COLREG, MARPOL, LOADLINES and TONNAGE, for which Vietnamese government has ratified. It is essential to supply competent seafarers who are well-trained and educated with systematic program of maritime education and training.

(c) Competent Seafarers

Vietnamese shipping industry needs the following competent seafarers who:

- operate ships equipped with modern machines and equipment, and who have sufficient technical knowledge on advanced maritime technology and are familiar with various types of automatic and remote control systems;
- operate various kinds of ships such as general cargo ships, container ships, crude oil tankers, chemical tankers and other specialized ships;
- in the future, will become qualified dual-function seafarers since some of them have the qualification of both an engineer and navigation officer, and

- are satisfactorily educated and trained with modern equipment required by the relevant international conventions such as STCW-78/95 SOLAS and MARPOL.

4.1.2 Demand for Seafarers

(a) Demand for Seafarers on Quality

Based on the fleet development plan of Vietnamese shipping industry, the demand for seafarers will focus mainly on the competent seafarers suited to ships equipped with modern machines and equipment, ships newly built (foreign purchased or chartered). The Study Team estimated the future demand of Vietnamese seafarers in years 2000 and 2005 as presented in Table 4.1.1, in which the seafarers suited to ships whose age are under 10 years in the year 2000 and under 15 years in the year 2005 as well as those purchased from foreign countries.

Table 4.1.1
FUTURE DEMAND OF 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
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

The demand for seafarers suitable for modern ships will increase through time and in year 2005 about half of the seafarers will become competent and with the ability to operate modern ships safely and efficiently.

(b) Demand for Number of Seafarers

The estimated number of Vietnamese seafarers except seafarers for fishing, tug, barge and miscellaneous ships is shown in Table 4.1.2.

Table 4.1.2
ESTIMATED NUMBER OF VIETNAMESE SEAFARERS

	Officers	Ratings	Total
Estimated number of Existing seafarers	2,500	6,500	9,000
Demand in year 2000	5,085	8,099	13,184
Demand in year 2005	6,633	10,763	17,396

Based on the estimated number of Vietnamese seafarers in Table 4.1.2, the net growth of demand in the number of Vietnamese seafarers over the period 2000-2005 is presented in Table 4.1.3.

Table 4.1.3
ESTIMATED ANNUAL NET GROWTH OF DEMAND
FOR VIETNAMESE SEAFARERS

	Officers	Ratings	Total
Annual net growth of demand up to 2000	646	400	1,046
Annual net growth of demand 2000 to 2005	310	533	843

The future demand for Vietnamese seafarers depends on the ability of duly competent seafarers by the maritime schools. If Vietnamese seafarers will be internationally accepted as competent seafarers, the demand for Vietnamese seafarers will increase particularly for overseas employment, and the estimated number of demand for Vietnamese seafarers must be revised upward. On the other hand, the standard manning scale for each ship will decrease in the future with the implementation of advanced maritime technology for the operation of Vietnamese ships.

4.1.3 Supply of Seafarers

(a) Supply Capacity of Existing Maritime Schools

The existing maritime schools have the capacity to supply about 620 officers and 610 ratings annually, and every maritime school has a plan to improve the facility and equipment for maritime education and training, and has an intention to expand the supply capacity in the future.

Considering the supply capacity of existing maritime schools and the attrition ratio of Vietnamese seafarers, the Study Team assessed that it is possible to supply the required number of Vietnamese seafarers by the existing maritime schools.

To have a successful supply plan for seafarers, the Study Team recommends to establish the following measures:

- Seafarers database system must be formulated in order to grasp the present situation of Vietnamese seafarers, and the data should be accurate and regularly updated.
- Demand for and supply of seafarers will be reviewed from time to time following the fleet expansion plan, and the supply plan will be revised to meet the national demand.
- For the supply side, the required number of seafarers in each rank have to be thoroughly analyzed and the number of enrollment at the maritime schools should

be reliable in comparison with the national demand for seafarers including overseas employment.

- Upgrading of existing seafarers with re-education must be properly undertaken by using appropriate equipment for maritime education and training in accordance with the international requirement, so that the existing seafarers are able to be employed on-board the modern ships including foreign ships.

(b) Supply of Competent Seafarers

Under the present maritime education in Vietnam, there exists the lack of appropriate equipment and machines for training purposes, and with this situation, it is not easy to supply duly competent seafarers to both local and international shipping industry.

It is essential that upgrading of facilities and equipment materialize at the existing maritime schools to be able to supply sufficient number of competent seafarers who receive appropriate education and training who can comply with international requirements in using modern equipment and machines for maritime education and training including simulator systems.

It is very important for the country to intensify efforts in education and training of qualified seafarers at the existing maritime schools. The Study Team recommends that the supply plan of competent seafarers be implemented as follows:

- Upgrading of equipment and machines, and development of instructors' ability at VIMARU and MTTSS.
- To establish new system for maritime education and training by using equipment and installments required by the international convention at the maritime schools.
- In addition to the maritime education and training for freshmen at the maritime schools, the existing seafarers should be re-educated at the maritime schools with the equipment and machines required by international standard so that the existing seafarers would be accepted internationally and would be able to get better job on-board modern and foreign ships.
- To give more opportunities for working on-board various types of foreign ships such as VLCC, LPG Tanker, Chemical Tanker, Container ships, Car Carrier, and other kinds of specialized ships, especially for young seafarers.
- After having enough on-board experiences, the competent seafarers can become key personnel working on-board modernized Vietnamese fleet and the number of competent seafarers will increase due to more effective OJT on-board vessel.

4.2 Improvement of Maritime Schools

4.2.1 VIMARU

(a) Objectives

The university level of maritime education and training is undertaken only at the Vietnam Maritime University in Haiphong and its branch in Ho Chi Minh City. There are academic courses with duration of five years for a Bachelor of Science degree, in which most students are candidates for navigational officers and maritime engineers. There are also upgrading courses at the "Maritime Training Center" in Haiphong and "South Seafarers' Training and Employment Center" in Ho Chi Minh City, in which navigational officers and maritime engineers can undertake re-education to obtain certificate of competency in the first class and second class. The maritime education and training must be complied with according to both the international and national requirements.

As a result of the Study Team's evaluation, it was found that VIMARU has difficulties in supplying competent seafarers who are duly qualified and suitable for modern ships. It is required that seafarers have enough knowledge and technical ability to operate equipment are controlled by automatic control systems.

The students of VIMARU and the existing Vietnamese officers are requested to receive systematic practical training on-board or at the university. The practical training must be systematic, and must be closely supervised and monitored by duly qualified instructors. The objective of the practical training is to consolidate and expand theoretical knowledge and to gain experiences in the relevant aspects of shipboard activities which include simulator-based training.

The country's demand for competent and well-trained seafarers who can operate various types of modern ships safely and efficiently as multipurpose seafarers will increase in the future. Considering the present condition of Vietnamese shipping fleet, it is impossible to have an effective on-board practical training by the Vietnamese conventional ships, and it is essential to train the existing seafarers and students of VIMARU at the VIMARU training center using modern equipment and training facilities including simulation systems.

(b) Improvement of the Equipment and Facilities at VIMARU

1) Simulator-Based Training on Radar and ARPA

The amended International Convention STCW-95 will be effective 1 February 1997 and the Automatic Radar Plotting Aid (ARPA) simulation will be mandatory based training for certification of Ship Master and Navigational Officers with the transitional provision that:

- it is scheduled to be fully enforced on 1 February 2002
- it may continue to issue, recognize and endorse certificates with the provision of the Convention which applied immediately prior to 1 February 1997
- in respect of those who have approved sea-going service, an approved education and training program or an approved training course before 1 August 1998.

Therefore, the seafarers and students who commence approved seagoing service, an approved education and training program and training course after 1 August 1998 should have simulator-based training on Radar and ARPA for certification of Ship Master and Navigational Officers. In this connection, the Maritime education and training at VIMARU must be programmed in accordance with the regulation of the amended STCW-95. The Study Team strongly recommends the establishment of the Radar and ARPA simulation-based training course at VIMARU at the latest before 1 August 1998.

2) Simulator-Based Training on GMDSS and Radio Communication Training

Considering the full introduction of GMDSS scheduled from 1 February 1999, it is essential to establish an international system for the complete introduction of the GMDSS. Radio operator and GMDSS personnel must be educated and trained efficiently and effectively with the use of GMDSS and radio communication training simulator. The Study Team recommends to establish the Simulator-based training on GMDSS and Radio Communication training course at VIMARU as soon as possible at the latest before 1 February 1999.

3) Practical Training Equipment for Marine Engineers

In accordance with technical requirements by the national and international shipping companies, the graduates of VIMARU can become fully qualified seafarers to be employed by the shipping industry. The Marine engineers in particular must become familiarized with various types of modern machines which have advanced maritime technologies such as automatic and remote control systems. For the purpose of education and training of competent marine engineers, the Study Team recommends the use of equipment such as:

- diesel engine plant with auxiliary machines, or
- engine room simulator system

(c) Preparation of Highly-Skilled and Trained Instructors

In addition to the upgrading of the equipment and machines for maritime education and training, it is essential to prepare the instructors for upgrading the level of practical training and familiarizing themselves with the regional and international shipping requirements.

It is more advantageous for Vietnam to receive technical cooperation by the maritime advanced countries, wherein the Vietnamese instructors can attend the training courses held in these maritime advanced countries to study the development of adequate training program, curriculum design, practical training including on-board training and familiarization training of simulator systems and other equipment for maritime education and training.

(d) Improvement of Training Program and Curricula

In accordance with implementation of simulation systems and other modern equipment and machines for maritime education and training and the curricula must be carefully examined by the qualified experts of maritime education and training considering the following points:

- The present curricula was introduced in 1993 in accordance with the IMO model course.
- The curricula and the training program must be reviewed and improved in accordance with the amended STCW-95 and for effective use of the simulation systems and other modern equipment and machines.
- The curricula, syllabi and the training program must be appropriate enough in compliance with the international conventions and national demand for competent seafarers.

(e) Improvement Plan

The Study Team recommends the following process for the implementation of the Short term priority projects for the improvement of VIMARU.

1) A survey by the qualified experts of maritime education and training

A navigational expert and a marine engineering expert must be tapped to look into upgrading equipment and facilities at VIMARU, and assessment of equipment to be installed such as:

- the equipment and installments for basic education and training;
- the Radar and ARPA simulation system
- (Estimated Cost: 150,000,000 Japanese Yen)
- diesel engine plant with auxiliary engines,
- (estimated Cost: 200,000,000 Japanese Yen)
- GMDSS and Radio Communication training simulator system,
- (Estimated Cost: 100,000,000 Japanese Yen), and
- tanker operation familiarization training set.

2) Project Type Technical Cooperation Of the Maritime Advanced Country

It is recommended to implement the project type technical cooperation by the maritime advanced country, for:

- upgrading of equipment and facilities for maritime education and training at VIMARU, and
- development of instructors' ability for maritime education and practical training

4.2.2 MTTTS No. 1 and HCM, MTTTS

(a) Objectives

The MTTTS No. 1 and HCM, MTTTS have mainly supplied ratings to the shipping industry, and in addition to training of ratings, the schools started upgrading courses for navigational officers and marine engineers in classes 3 and 4. For Vietnamese shipping industry, especially coastal shipping, it is very important to upgrade MTTTS No. 1 and HCM, MTTTS so that these schools supply duly qualified seafarers to the shipping industry.

As the result of the Study Team's observation, MTTTS No. 1 and HCM, MTTTS have difficulties in supplying competent seafarers who are duly qualified on international standards, and are also suitable for modern ships,

In the future, the shipping industry's demand for seafarers include well trained seafarers who can operate various types of modern ships safely and efficiently as multipurpose seafarers who have enough knowledge and technical ability to operate the modern equipment with automatic control systems.

However, considering the present condition of Vietnamese shipping fleet, it is impossible to have an effective on-board practical training on-board by the Vietnamese conventional ships, and it is essential that the existing ratings and candidates of ratings be trained or upgraded with a systematic and an appropriate training program on modern equipment and training facilities including simulation systems.

(b) Improvement of Equipment and Facilities at MTTTS No.1 and HCM, MTTTS

In accordance with technical demand required by the national and international shipping companies, the graduates of the schools will be fully accepted as qualified seafarers by the shipping industry. Especially the navigational officers and marine engineers in classes 3 and 4 must have enough knowledge and technical ability and be familiar with various types of modern equipment which have advanced maritime technologies and remote control systems.

For the purpose of education and training of competent seafarers, the Study Team recommends to upgrade equipment and facilities at MTTS No. 1 and HCM, MTTS.

(c) Development of Instructors Ability for Education and Practical Training

It is essential that not only the equipment and machines for maritime education and training be upgraded but also to train instructors for upgrading the level of skills and knowledge about the various national and international maritime requirements.

The Study Team recommends that instructors of MTTS No. 1 and HCM, MTTS to attend the training courses held in the maritime advanced countries to study the development of adequate training program, curriculum design, practical training including on-board training and familiarization training of simulator systems and other equipment for maritime education and training.

(d) Improvement of Training Program and Curricula

In accordance with implementation of simulation systems and other modern equipment and machines for maritime education and training, the curricula and syllabi must be carefully examined by the qualified experts of maritime education and training considering the following:

- the present curricula was introduced in 1992;
- the curricula and the training program must be reviewed and improved in accordance with the amended STCW-95 and for effective use of the modern equipment and machines which will be installed at the schools.
- the curricula and the training program must be appropriate enough in compliance with the international conventions and national demand for competent seafarers.

(e) Improvement Plan Procedure

The Study Team recommends the following procedure for implementation of the Short term priority project for the Improvement of MTTS No. 1 and HCM, MTTS.

1) A survey by the qualified experts of maritime education and training

A navigational expert and a marine engineering expert must attend a two-month training course to look into the upgrading of equipment and facilities at MTTS No. 1 and HCM, MTTS and conduct assessment of equipment to be installed.

2) Technical Cooperation by an Advanced Country in Maritime Sector

It is recommended that some instructors of MTTS No. 1 and HCM, MTTS be encouraged to attend the training courses held in the maritime advanced countries to study the development of adequate training program, curriculum design, practical

training including on-board training and familiarization training of simulator systems and other equipment for maritime education and training.

3) Improvement Plan of MTTS No. 1 and HCM, MTTS

After the survey by the qualified experts from the maritime advanced country and the Vietnamese instructors' completion of foreign training courses, the improvement plan for the upgrading of equipment and facilities must be jointly formulated by foreign expert and the Vietnamese instructors. It is also recommended that the improvement plan of HCM, MTTS will be immediately prepared to be in time for the school transfer to a new site.

4.3 Training of Seafarers for Tanker Operation

4.3.1 Requirements

(a) International Requirements

After the remote control system became useful on-board ships, the technological development made it possible to control huge tanker such as Very Large Crude Oil Carrier (VLCC) by a limited number of seafarers on-board. However, once a serious maritime accident happens (most common cause is human error as reported) on such ships as VLCC tremendous damage could result to not only loss of lives and property but pollution and extreme damage to marine environment..

In order to prevent such marine casualty and pollution at sea, the International conventions MARPOL and STCW-78/95 stipulate various regulations. The training and qualification of officers and ratings serving on ships carrying oil, chemical or liquefied gases in bulk is strictly regulated. The training for tanker operation must be strictly and appropriately practiced in accordance with the requirements of the international convention STCW-78/95 and MARPOL.

(b) National Requirement

For oil refinery project in Vietnam, the demand for seafarers on tanker operation will increase in the future. The seafarers serving on tankers are requested not only to be familiar to operate the tankers safely and efficiently but must have enough knowledge about the characteristics and handling of oil and chemical cargoes and safety procedures, and procedures for prevention of oil pollution at sea.

The Maritime Training Center in VIMARU Haiphong and the South Seafarers' Training and Employment Center in VIMARU branch in HCM City were established for the purpose of the qualification training required by the International Convention STCW-78.

In addition to the basic and advanced training for qualification of seafarers, the training centers must have the training courses for tanker operation including shore personnel involved in oil refinery project.

4.3.2 Upgrading of the Training Courses

(a) Current Condition of the Training Courses

The Training Center introduced the curricula of New Model Course Program of VIMARU for following training courses involved in tanker operation:

- | | |
|---|------------|
| • MARPOL 73/78-Annex I | 30.0 hours |
| • MARPOL 73/78-Annex II | 20.0 hours |
| • Oil tanker familiarization | 35.0 hours |
| • Advanced Training on oil tanker operation | 70.0 hours |

The training was practiced mainly for education which is not enough, the practical familiarization training is critical due to lack of training equipment and machines.

The instructors should have some service experiences on-board foreign tankers as training cadets or attended foreign training courses in a short period.

(b) Upgrading of the Training Courses

In order to improve and maintain a high standard of training, the following measures are recommended:

For familiarization of various tanker operations, it is recommended that a cargo handling simulator be installed for cargo loading and unloading operation and inert gas operation which consist of the following instruments;

- Cargo Valve Control Console;
- Inert Gas System Control Panel;
- Local Valve Operation Panel;
- Viewing Service System for memorize local view by through CRT;
- Pumping Sound Synthesizer System;
- Instructor Console for controlling and managing simulator operation.

The instructor must have enough technical knowledge and experiences on actual work of various type of oil tankers. To develop instructors' ability on education and practical training, it is recommended that they attend training courses held in maritime advanced country to have:

- experiences on actual on-board training experience

- development of technical ability and knowledge for education and practical training at some training center for tanker operation equipped with the cargo handling simulator or the central cargo control console.

(c) Process of the Upgrading of Training Courses for Tanker Operation

The Study Team recommends that this upgrading project of training courses for tanker operation will be carried out together with the improvement project of VIMARU in Section 4.2.1 of this report. This is necessary so that the navigational expert attending VIMARU will assess installation of equipment and machines for the tanker operation familiarization training, and the Vietnamese instructors and foreign experts under the technical cooperation project between Vietnam and the maritime advanced country, will jointly undertake this upgrading project.

APPENDIX 1

THE CURRICULA
IMPLEMENTED
AT
VIMARU

UPGRADING TRAINING PROGRAMME OUTLINE FOR MASTER

The program for the first class master.

1. Terrestrial Navigation	50 hours
2. Celestial Navigation	40 -
3. Meteorology	20 -
4. Radar observation and plotting	40 -
5. Maritime Safety / Pollution Prevention MARPOL - 73/78 ANNEX 1, ANNEX 2.	60 -
6. Port State Control	25 -
7. Maritime Search and Rescue	30 -
8. Marine Aids to navigation	25 -
9. Marine Radio equipment	25 -
10. Regulations for preventing collision at sea (COLREG) and manoeuvring	50 -
11. Marine commerce	40 -
12. Maritime law and ship's business for master	40 -
13. Marine insurance	20 -
14. Cargo handling	25 -
15. Informatics	35 -
16. Seminars	20 -
Total	545 hours

The programme for the second class master

1. English	100 hours
2. Navigation and tide	40 -
3. Celestial Navigation	30 -
4. Meteorology	20 -
5. Ship's engine	15 -
6. Ship's electricity	15 -
7. Marine Aids to navigation	30 -
8. Marine Electronic equipment	30 -
9. Regulations for preventing collision at sea and manocuvring (COLREG)	50 -
10. Marine business	40 -
11. Maritime law and ship's business for master	40 -
12. Marine insurance	25 -
13 Cargo handling	30 -
14. Computer studies	35 -
15. Ship's radar	40 -
16. Seminars	15 -
Total	555 hours

Equivalent to 16 weeks,of theory, 4 weeks of exam.

The program for 3rd class master.

1. Manoeuvring	30 hours
2. Marine Aids	50 -
3. Magnetic compasses - Magnetic compasses' errors	20 -
4. Meteorology - tide	30 -
5. COLREG	20 -
6. Navigation geography	30 -
7. Marine commerce (Cargo plan, note of conveyance, cargo damage report, sea protest)	60 -
8. Ship's business for master (Registry notes, labour insurance law, Vietnam Maritime law)	50 -
9. English	100 -
10. Computer studies	35 -
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Total	425 hours
	13 weeks

The programme for the 4th class master.

1. Ship-manceuvring	35 hours
2. Marine Aids	50 -
3. Magnetic compasses - tide	20 -
4. COLREG	20 -
5. Meteorology - tide	30 -
6. Navigation	30 -
7. Maritime commerce	50 -
8. Ship's business for master	40 -
9. English	100 -
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Total	375 hours
	11 weeks

UPGRADING TRAINING PROGRAMME OUTLINE FOR CHIEF ENGINEER

The first class engineer.

1. Subject.

Subject	Hours
1. Marine steam system	40
2. Operation of engine system	40
3. Hydraulic machinery	20
4. Methods of warning of deficiency	20
5. Marine diesel engine	40
6. Marine electricity	40
7. Ship's automation	40
8. Oil, grease, water	20
9. Seminars	60
- Environment protection	
- Maritime law for Chief Engineer	
- Psychology of seafarers	
- Sea transport economic	
10. Ship's business for Chief Engineer	20
11. Maritime English	40
Total	380 hours

2. Stipulation of examinations and test.

a) Examinations:

1. Operation of engine system
2. Marine diesel engine
3. Marine electricity
4. Ship's automation

b) Tests:

1. Marine steam system
2. Hydraulic machinery
3. Methods of warning of deficiency
4. Oil, grease, water
5. Ship's business for Chief Engineer
6. Maritime English.

Chief engineer of second class

1. Subject.

Subject	hours
1. Marine diesel engineer	40
2. Operation of engine system	40
3. Hydraulic machinery	30
4. Ship's turbine	30
5. Refrigerating system and air conditioning	30
6. Ship's automation	40
7. Marine electricity	40
8. Oil, grease, water	20
9. Seminars	60
Registry, machinery insurance	
Environment protection	
Sea transport economics	
10. Repair	30
11. Ship's business for Chief Engineer	20
12. Maritime English	40
Total	420 hours

2. Stipulation of examinations and tests.

a) Examinations

1. Marine diesel engine
2. Operation of engine system
3. Ship's automation.
4. Marine electricity.

b) Tests

1. Hydraulic machinery.
2. Ship's turbine.
3. Refrigerating system and air conditioning.
4. Oil, grease, water.
5. Repair.
6. Chief engineer business
7. Maritime English.

Third class chief engineers

1. Subject

Subject	hours
1. Diesel, heat, heat transmission	50
2. Operation of engine system	30
3. Auxiliary machinery	30
4. Refrigerating machinery	30
5. Boiler, heat, heat transmission	30
6. Automation	30
7. Repair and repair organization	40
8. Marine electricity	40
9. Ship's theory	20

10. Seminars	40
Registry and engine law	
Machinery insurance	
Seatransport economics	
11. Oil, grease, water	20
12. Chief engineer business	30
13. Maritime English	40
Total	430 hours

2. Stipulation of examination and test.

a) Examination

1. Marine diesel engine
2. Operation of engine system
3. Repair and repair organization
4. Marine electricity

b) Test

1. Refrigerating machinery
2. Boiler
3. Automation
4. Ship's theory
5. Auxiliary machinery
6. Oil, grease water
7. Chief engineer business
8. Maritime English

Fourth class chief engineer

1. Subject

Subject	hours
1. Diesel	60
2. Operation of engine systems	45
3. Auxiliary machinery	40
4. Repair and repair organization	30
5. Marine electricity	40
6. Registry and engine law	30
7. Ship's business for Chief Engineer	25
Total	270 hours

2. Stipulation of exam, and test

a) Exam

1. Diesel
2. Operation of engine system
3. Auxiliary machinery
4. Repair nad repair organization

b) Test

1. Marine electricity
2. Registry and engine law
3. Ship's business for Chief Engineer.

NEW MODEL COURSE PROGRAMME OF VIMARU FOR REFRESHER

GROUP 1: SEAGOING STAFF (Short or specialized courses)

Course 1.01

Radar observation and plotting

SUBJECT AREA	Hours
1. Fundamental Theory	50.0
2. Setting up and Maintaining Displays	
3. Marine Radar Performance specification	
4. Plotting	
5. The Use of Radar in Navigation	
6. Radar and COLREG 1972	
7. Review and Final Assessment	

Course 1.02

The operational Use of Automatic Radar Plotting Aids

SUBJECT AREA	Hours
1. Review of plotting techniques	40.0
2. Principal ARPA Systems	
3. IMO Performance standards for ARPA	
4. Acquisition of targets	
5. Tracking capabilities and limitations	
6. Processing Delays	

SUBJECT AREA	Hours
7. Setting up and Maintaining Displays 8. Representation of target information 9. Errors in Displayed Data 11. System Operational Tests 12. Risks of Over reliance on ARPA 13. Obtaining information from ARPA Displays 14. Application of COLREG 1972	

Course 1.03

Radar Simulator

SUBJECT AREA	Hours
1. Familiarization with the Simulators "Own Ship" Characteristics and Controls 2. Review of Basis-Radar and plotting 3. Open watch Exercises in the Application of COLREG 1972 4. Exercises in navigation and Collision Avoidance in Confined and Congested Waters 5. Exercises in and near Traffic Separation	35.0

Course 1.04

Marpol 73/78 - Annex I

SUBJECT AREA	Hours
1. Marine Pollution	30.0
2. Annex 1	
3. Control of Oil discharge from Machinery Spaces	
4. Documentation	
5. Miscellaneous	
6. Introduction	
7. Control of Oil Discharges from oil tankers	
8. Documentation	

Course 1.05

Marpol 73/78 - Annex II

SUBJECT AREA	Hours
1. Introduction	20.0
2. Annex II. Substances	
3. Discharge of Noxious Liquid Substances (NLS)	
4. Unloading, stripping and Prewash operations	
5. Documentation	
6. Miscellaneous	

Course 1.06

Medical Emergency Basis Training

SUBJECT AREA	Hours
<ol style="list-style-type: none"> 1. General Principles 2. Body Structure and Functions 3. Positioning of Casualty 4. The Unconscious Casualty 5. Resuscitation 6. Bleeding 7. Management of Shock 8. Burn and Scalds, and Accidents Caused by Electricity 9. Rescue and Transport of Casualty 10. Other topics 	15.0

Course 1.07

Basis Stability

SUBJECT AREA	Hours
<ol style="list-style-type: none"> 1. Displacement 2. Buoyancy 3. Fresh Water Allowance 4. Statical stability 5. Curves of Statical Stability 6. Angle of Loll 7. Initial stability 8. Movement of the centre of Gravity 9. Lists and their correction 10. Movement of G Caused by Suspended Masses 11. Movement of G Caused by Presence of liquids 	25.0

SUBJECT AREA	Hours
12. Movement of G due to Ballasting	
13. Simplified Stability calculations	
14. Changes of Stability during a voyage	
15. Trim	
16. Effect of Forces on the Structure	

Course 1.08

Personal survival

SUBJECT AREA	Hours
1. Introduction, Safety and Survival	
2. Emergency situations	
3. Evacuation	
4. Survival Craft and Rescue Boats	20.0
5. Personal life-saving appliances	
6. Personal life-saving appliances (Demonstration)	
7. Survival at sea	
8. Helicopter Assistance	
9. Emergency Radio Equipment	
10. Review and Final Assessment	

Course 1.09**Basis Fire fighting**

SUBJECT AREA	Hours
1. Introduction Safety and Principles 2. Theory of Fire 3. Fire prevention 4. Fire detection 5. Fixed fire-extinguishing systems 6. Miscellaneous Fire-fighting Equipment 7. Ship Fire-fighting organization 8. Fire-fighting Methods 9. Fire-fighting Drills	20.0

Course 1.10**Oil tanker Familiarization**

SUBJECT AREA	Hours
1. The oil tanker 2. Petroleum Properties and Hazards 3. Oil Cargo Containment and Handling 4. Oil Tanker Operation 5. Marine Pollution 6. Safety 7. Review and final Assessment	35.0

Course 1.11 Advanced Training Programme on Oil Tanker Operation

SUBJECT AREA	Hours
1. Introduction	70.0
2. Basis Properties of petroleum and its hazards	
3. Safety	
4. Pollution Prevention	
5. Oil tanker Design and Equipment	
6. Oil tanker operation	
7. Miscellaneous	
8. Emergency Procedures	
9. Inert Gass Systems (IGS)	
10. Crude Oil Washing (COW)	

GROUP 2: SEAGOING STAFF (advanced courses)

Course 2.01 Maritime Search and Rescue Co-ordinator Surface Search

SUBJECT AREA	Hours
1. Administration	30.0
2. International Provision	
3. Communications	
4. Operating Procedures	
5. SAR Resources	
6. Navigation	
7. Search Areas	
8. Search Patterns	
9. Review and Final Assessment	

Course 2.02 Engine Room Simulator

SUBJECT AREA	Hours
1. Familiarization	30.0
2. Operation	
3. Watchkeeping	
4. Trouble-shooting	

**GROUP 3: MARITIME SAFETY/POLLUTION PREVENTION
(ADMINISTRATION)**

Course 3.01

Survey of Machinery Installations

SUBJECT AREA	Hours
1. Introduction	45.0
2. Preparation for Surveys	
3. Machinery Survey Methods	
4. Non-destructive testing	
5. Survey of Machinery Systems	
6. Survey of Boilers and pressure Vessels	
7. Survey of Steam Turbine	
8. Survey of Diesel Engine	
9. Survey of Gearing Arrangements	
10. Survey of Shafting Arrangements	
11. Survey of Steering Gear System	
12. Practical Application	
13. Review and Final Assessment	

Course 3.02

Survey of Electrical Installations

SUBJECT AREA	Hours
1. Introduction	45.0
2. Preparation for Surveys	
3. Electrical installation	
4. The Electrical Hazard in Zones with High Risk of Fires and Explosions	

SUBJECT AREA	Hours
5. Special Requirements	
6. Unattended Machinery Spaces	
7. Electrical Survey Procedures	
8. Practical Application	
9. General Review and Discussion	

Course 3.03

Port State Control

SUBJECT AREA	Hours
1. Need of Control	55.0
2. Main Elements of the Convention Requirements	
3. Documentation	
4. Inspection of Ship	
5. Action by the Port State	
6. Practical Port State Control Training	

Course 3.04

Marine Accident and Incident Investigation

SUBJECT AREA	Hours
1. International obligations	95.0
2. Investigative Purpose and Procedures	
3. Analysis of Evidence	
4. Inquiry Reports	
5. Administration of investigations	
6. Findings and Recommendations	
7. Group Activity Case Studies	

Course 3.05

Maritime Search and Rescue Administrator

SUBJECT AREA	Hours
1. Administration	
2. Communication	
3. International Provisions	
4. Meteorology	
5. Navigation	
6. Operating Procedures	
7. Public Relations	
8. RCCs and RSCs	
9. SAR Resources I	
10. SAR Training	45.0
11. Search Areas	
12. Search Patterns	
13. Ship Reporting Systems	
14. General Review	
15. Evaluation	

Course 3.06

Maritime Search and Rescue Mission Co-ordinator

SUBJECT AREA	Hours
1. Administration	
2. Communications	
3. International Provisions	
4. Meteorology (I+II+III)	
5. Navigation (I+II+III+IV)	
6. Operating Procedures I	

SUBJECT AREA	Hours
7. Public Relations (Day-to-day media relations)	
8. RCCs and RSCs	
9. SAR resources I	
10. SAR Training	
11. Search Areas (Establishing search areas)	
12. Search Patterns I	
13. Ship Reporting Systems	
14. General Review	
15. Evaluation	
16. Communications	
17. International Provisions	
18. Meteorology (IV)	
19. Navigation (V)	
20. Operating Procedures II	
21. Public Relations (informing news media)	100.0
22. SAR resources II	
23. Search Areas	
24. Search Patterns II	
25. General Review	
26. Evaluation	

GROUP 4: SHIPPING COMPANY STAFF

Course 4.01

Planned Fleet Maintenance and Protection

SUBJECT AREA	Hours
1. Sea Transportation	
2. Business Concepts	
3. Role and Objectives of Fleet Management	
4. Fleet Management Activities	
5. Division of Responsibility and Authority	45.0
6. Maintenance Planning and Control	
7. Maintenance and Repair	
8. Management of Spare Part and Material	
9. Planning and Organizing Dry-docking and Repair Work	
10. Cost Control	
11. Monitoring the Condition of Painted Surface	
12. Paints	
13. Standards	
14. Steel Surface Preparation	
15. Paint Application	20.0
16. Control Control Equipment and Reporting	
17. Underwater Hull Surface Finish	
18 Maintenance	

* New courses to be developed in future.

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