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No.

THE REPUBLIC OF THE PHILIPPINES
MARITIME INDUSTRY AUTHORITY
THE STUDY ON MASTER PLAN ON MARITIME SAFETY IN THE REPUBLIC OF THE PHILIPPINES

FINAL REPORT

SUMMARY

THE REPUBLIC OF THE PHILIPPINES
MARITIME INDUSTRY AUTHORITY

THE STUDY ON MASTER PLAN ON MARITIME SAFETY IN THE REPUBLIC OF THE PHILIPPINES

FINAL REPORT (TECHNICAL REPORT)

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AUGUST 1992

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

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Preface

In response to a request from the Government of the Republic of the Philippines, the Government of Japan decided to conduct a master plan study on Maritime Safety in the Republic of the Philippines and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Philippines a study team headed by Mr.Kenji YANO, Excecutive Director, The Japan Association for Preventing Marine Accidents, three times between March 1991 and June 1992.

The team held discussions with the officials concerned of the Government of the Philippines, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of the friendly relations between our two countries.

I with to express my sincere appreciation to the officials concerned of the Government of the Republic of the Philippines for their close cooperation extended to the team.

August 1992

Kensuke Yanagiya

Kensuke Yanagiya
Presidet
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency

Dear Mr. Yanagiya:

We have the honor to submit to you our final report for the Study on Master Plan on Maritime Safety in the Republic of Philippines. It is with great pleasure that this Study has been completed under the close cooperation of the two governments of Japan and Philippines.

The final report has been prepared during the past 17 months by the Study Team organized by members of the Japan Association for Preventing Maritime Accidents in association with Yachiyo Engineering Co., Ltd., and headed by Mr. Kenji Yano. It comprises a Summary, Main Report, Technical Report, and Data Base.

In preparing this Report, our Team benefited a great deal of the cooperation of officials and experts of the Japan International Cooperation Agency and other authorities concerned of the Government of Japan.

On behalf of the Study Team, I would like to express my deepest appreciation to the officials concerned and to other related agencies of the Republic of Philippines for their enormous cooperation, assistance and warm hospitality extended to the Study Team members.

We sincerely hope that this Report will contribute to the further development of the Republic of Philippines.

Sincerely yours,

Kenji Yano

Kenji Yano
Team Leader
Study Team of the Study
on Master Plan on
Maritime Safety in the
Republic of Philippines

TECHNICAL REPORT
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GLOSSARY OF TERMS

AFP	Armed Forces of the Philippines
ANC	Aids to Navigation Command, PCG
ATO	Air Transportation Office
BC	Bureau of Customs
BCGS	Bureau of Coast & Geodetic Survey (now only an office under NAMRIA)
BHE	Bureau of Higher Education
BPW	Bureau of Public Works (reorganized into the Department of Public Works & Highways)
BSMT	Bachelor of Science in Maritime Transportation
CA	Commonwealth Act
CGD	Coast Guard District
CISO	Conference of Interisland Shipowners & Operators
COSPAS	COSMOS Satellite for Program of Air and Sea Rescue
CPC	Certificate of Public Convinience
DECS	Department of Education, Culture & Sports
DENR	Department of Environment & Natural Resources
DFA	Department of Foreigh Affairs
DIBAN	District Board for Aids to Navigation
DILG	Department of Interior & Local Government
DND	Department of National Defense
DOH	Department of Health
DOJ	Department of Justice
DOLE	Department of Labour & Employment
DOTC	Department of Transportation & Communications
DPWH	Department of Public Works & Highways
DSWD	Department of Social Welfare & Development
DTI	Department of Trade & Industry
EO	Executive Order
F/B	Fishing Boat
FPAP	Filipino Pilots Association of the Philippines
GDP	Gross Domestic Product
GMDSS	Global Maritime Distress and Safety System
GNP	Gross National Product
GRDP	Gross Domestic Regional Product
GRT	Gross Registered Tonnage
HANC	Headquarters, Aids to Navigation Command, PCG
HO	Head Office
IALA	International Association of Lighthouse Authorities
IMO	International Maritime Organization (formerly IMCO)
INMARSAT	International Maritime Satellite Organization
IMOSAR	International Convention on Maritime Search & Rescue
LAP	Lighterage Association of the Philippines
LGU	Local Government Unit
LOI	Presidential Letter of Instruction
LUT	Local User Terminal
M/B	Motor Boat
M/BCA	Motor Banca
M/L	Motor Launch
M/T	Motor Tanker
M/V	Motor Vessel
M/Y	Motor Yacht
MAPMAS	Master Plan on Maritime Safety
MARINA	Maritime Industry Authority

MC	Memorandum Circular
MCP	Maritime Communications Project
MICT	Manila International Container Terminal
MMS	Maritime Mobile Service
MO	Memorandum Order
MRCC	Manila Rescue Coordination Center
MSAR	Maritime Search & Rescue
MTPDP	Medium Term Philippine Development Plan
NABAN	National Board for Aids to Navigation
NAMRIA	National Mapping & Resource Information Authority
NAVTEX	Narrow Band Direct Printing
NBI	National Bureau of Investigation
NCR	National Capital Region
NEDA	National Economic & Development Authority
NMP	National Maritime Polytechnic (in this study, some times refers to National Municipal Port)
NMRC	National Maritime Rescue Center
NMSO	National Maritime Safety Organization
NSO	National Statistics Office
NTC	National Telecommunications Commission
NTPP	National Transportation Planning Project
PA	Provisional Authority
PAGASA	Philippine Atmospheric, Geophysical & Astronomical Services Administration
PCG	Philippine Coast Guard
PCGA	Philippine Coast Guard Auxiliary
PD	Presidential Decree
PDO	Port District Office
PFC	Philippine Fisheries Commission (now PFDA)
PFDA	Philippine Fisheries Development Authority
PHILSAR	Philippine Shipbuilders & Repairers Association
PHILTANKO	Philippine Association of Tanker Owners & Operators
PISA	Philippine Interisland Shipping Association
PMMA	Philippine Merchant Marine Academy
PMMRR	Philippine Merchant Marine Rules & Regulations
PMO	Port Management Office
PN	Philippine Navy
POEA	Philippine Overseas Employment Administration
PPA	Philippine Ports Authority
PRC	Professional Regulation Commission
RA	Republic Act
RCC	Rescue Coordinating Center
SAR	Search and Rescue
SARSAT	Search and Rescue Satellite Aided Tracker
SHIPPERCON	Philippine Shippers Council
SMSA	Southwestern Mindanao Shipowners Association
SOLAS	Safety of Life at Sea
SP	Special Permit
STCW	Standards for Training, Certification & Watchkeeping
TSS	Traffic Separation Scheme
VAFSO	Visayan Association of Ferryboat Service Operators

I . SECTOR STUDIES

1. MARITIME SAFETY EDUCATION

1.1 Current Maritime Education System

The maritime education in the Philippines is basically divided into two (2) main components, namely: formal and non-formal. The formal education system covers seamen who have attended college courses in maritime schools and training centers. The non-formal education covers fishermen, boat builders, and personnel on domestic vessels (i.e., persons employed as non-officers on barges, tankers, fishing boats, etc.) who virtually have no training at all except for their knowledge based on information handed down from elders and from their own actual experiences.

Todate, there are 65 maritime institutions nationwide offering courses leading to the following degrees: Bachelor of Science in Marine Transportation (BSMT) major in Nautical Studies or Marine Engineering, Basic Seaman Course (BSC), Naval Architecture and Marine Engineering (NAME), and Associate in Marine Engineering (AME). Of this total, only nine (9) are government-owned while the rest are private institutions and foundations (see Annexes 1.1 & 1.2 for the list of schools and their respective locations).

Formal education is classified into two (2), namely: shore-based and sea-based. Each class has a corresponding curriculum by category which are as follows: (a) Deck licensed officers, (b) Engine licensed officers, (c) Ratings and; (d) Special Training.

a) Deck/Engineer Officers

The existing curriculum for licensed officers follows a pattern of three (3) years at school and one (1) year at sea covering theory and practice, respectively. After the completion of the yearlong on-board training, they are conferred a degree in Bachelor of Science in Maritime Transportation (BMST).

The entry requirement for BSMT is for a student to pass the National College Entrance Examination (NCEE). Secondly, regulations dictate that a student must be physically and mentally fit for a sea career.

After completion of the foregoing program, they are entitled to take the board examination which is conducted by the Professional Regulations Commission (PRC). Upon passing the test, they are given a 3rd Mate (a post on deck) or 4th Engineer License.

Exceptional cases are graduates from Philippine

Merchant Marine Academy (PMMA) who are automatically given an initial grade of Certificate of Competency without taking the board examination provided that they pass the In - School Graduate examination. However, subsequent upper grade certificates (i.e., 2nd Mate and 3rd Engineer and above) are obtained only through the board examination under the PRC system as with other Maritime school graduates.

There is no difference in the manner of acquiring seafarer's licenses for coastal and ocean going vessels or for domestic and overseas vessels.

b) Ordinary Seamen (Ratings)

Basic Seamen Course (BSC):

This is a six-month course designed for ratings to acquire the basic knowledge of sea jobs. This course is conducted by schools and training centers for high school graduates.

Basic Merchant Marine Course:

This is ten-month training course for deck, engine and catering personnels. This course can be credited for the first year of BSMT study.

As a matter of fact, due to the oversupply of seafarers in the country, a large number of qualified officers (including engineers) are employed as ratings and seek chances for promotion. Upon acquiring the necessary and relevant training on board, chances for promotion are quite high.

Although courses for ratings (e.g., Basic Merchant Marine Course and Basic Seamen Course) are offered, enrollment figures are quite low (i.e., 2,200 for SY 1988-1989 and 1,686 for SY 1987-1988).

c) Others

Communication Course:

This is a two-year course taken after graduation from high school. This course is a requirement in obtaining a radio license by radio operators who may be employed at land based facilities, watercrafts and other platforms.

Special Training Courses:

There are several training courses offered by maritime

schools or independent training centers to meet the minimum standards stipulated in domestic or international regulations, particularly the International Convention on Standards of Training, Certification, Watchkeeping for Seafarers (STCW) 1978 and various recommendations and resolutions of the International Maritime Organization (IMO).

Under special courses, there are programmes for Radar Observation and Plotting (ROP), Radar Simulator Course (RSC), Automatic Radar Plotting Aids (ARPA), Tanker Safety and Operation (TSO) and various other courses which correspondingly upgrades officers and ratings in specialized technology.

Maritime Industry Authority (MARINA) endorses the certificates issued by the authorized training centers.

1.2 Results of the Investigation on Maritime Education

Around thirteen (13) maritime schools, three (3) training centers and six (6) shipping companies were visited in the National Capital Region (NCR) and the Visayas region (see Annex 1.3 for the complete list).

Generally, most schools lack the necessary modern equipments and training facilities. Likewise, the teaching staff lack training in modern technology which is basically rooted on the absence of a continuing education program for instructors.

Most private schools encountered difficulty in sending their students for shipboard training. However, some schools have established tie-ups with shipping companies with regard to on-board training.

It was further observed that there are too many maritime schools with insufficient number and quality of equipment that meet the minimum required standards of the STCW and the Enriched Guidelines, Procedures and Standards (EGPS) - DECS. The following main points/issues were gathered from officials of shipping companies:

- o High rate of turn over (i.e., well-experienced crew transfer to overseas vessels)
- o Lack of government assistance/support to domestic shipping unions with regard to workmen's compensation and welfare
- o Almost all vessels engaged in domestic service are considerably old, thus, the need for more skilled crew and shore-hands

1.3 Enrollments and Graduates of Maritime Courses

Table 1.1 gives the number of enrollments and graduates of all maritime courses. For school year 1988-1989, there were 26,850 enrollments with only 9,449 (35%) graduates. These figures are lower than those of the previous year; 10,036 (40%) graduates out of 24,786 enrollments.

Table 1.1
Enrollments and Graduates
by Maritime Course

MARITIME COURSE	Enrollments		Graduates	
	'88 -'89	'87-'88	'88-'89	'87-'88
Associate in Marine Transportation (AMT)	2,264	2,205	1,379	1,482
B.S. Marine Transportation (BSMT)	2,756	3,411	1,140	2,594
Associate in Marine Eng'g (AME)	19,306	16,393	4,730	4,274
Basic Seaman Course	2,524	2,777	2,200	1,686
TOTAL	26,850	24,786	9,449	10,036

Source: MARINA Survey

1/ Only 85% of total no. of Maritime Schools responded to survey

1.4 Supply and Demand of Seafarers and Training Demand For Officers

1.4.1 Supply and Demand of Seafarers

Statistics on the number of graduating students of maritime schools vis-a-vis board-examinees for the year 1989 reveal that only 33.7% of the total graduating students took the board examinations for deck and engine officers. Further, only 47% of the total examinees passed. (refer to Annex 1.4 for PRC Board Examination Results).

The following statistics present the type and number of vessels for the domestic fleet in 1989 (see Table 1.2).

Based on the given figures on total number of vessels plying the domestic route and based on the actual figures on the total required number of officers per vessel type, the following table was derived.

Table 1.2
Required Number of Officers Per Vessel Type
Domestic Fleet

	No. of Vessels 1/	Officers per vessel	Total Number of Officers
Liner Vessel	211	8	1,688
Tramp	331	6	1,986
Barges & Tugs	465	4	1,860
Oil, Parcel Tankers	97	8	776
TOTAL	1,104		6,310
			8,000 2/

1/ Domestic vessels of over 100 GRT.

2/ This figure is inclusive of the number of officers on leave. Percentage of on leave, 20%, is based on two (2) months on leave after one (1) year on-board.

Based on the point of view of a highly experienced seaman, particularly a Ship Captain, the distribution of officers (e.g., deck, engineer and radio) was calculated as shown in Table 1.3

Table 1.3
Assumed Distribution of Officers
per Vessel

Officer Category	Total No. of Officers	Distribution (%)
Deck	3155	50.0%
Engineering	2516	40.0%
Radio	639	10.0%
Total	6310	100.0%

Based on the approximate requirement of officers shown

above, the 8,000 was mathematically distributed to arrive at the breakdown of officers by category. (See Table 1.4)

Table 1.4
Officers by Category

Type	Overseas Officers	Domestic Officers
Deck Officers	12,500	4,000
Engineering Officers	10,000	3,200
Radio Officers	2,500	800
T o t a l	25,000	8,000

Statistics from Philippine Overseas Employment Administration (POEA) show that the number of seafarers totaled 100,000. From a manpower point of view, the number of officers required should be at least 25% of the total. Thus, there should be about 25,000 officers deployed overseas.

Based on the assumptions, the number of existing overseas officers per category was calculated using the same percentage distribution shown above (See Table 1.4).

1.4.2 Training Demand for Officers

To calculate the training demand for prospective officers, the normal rate of pulling out (i.e., resignation or retirement) from active ship duty must be considered. Based on actual experience, ten percent (10%) of total officers employed opt for retirement or resign from the industry. In view of this, the present demand for training of officers was determined as shown in Table 1.5.

Table 1.5
Training Demand for Officers

Officers	Present Population of Officers	Demand for Training
Deck Officer	(12,500 + 4,000) x 10%	1,650
Engineering Off	(10,000 + 3,200) x 10%	1,320
Radio Officer	(2,500 + 800) x 10%	330
TOTAL		3,300

Notably, around 3,300 officers are required yearly to offset the need.

1.5 Recent Government Measures to Improve the System

a) Associate in Marine Engineering (AME) upgraded

Per Department of Education, Culture and Sports (DECS) Order No. 22, Series of 1991 issued on 30 January 1987, the AME course was upgraded to a four (4) year ladderized course leading to a degree in BSMT.

b) Jurisdiction over the conduct of board examinations transferred from PRC to MARINA

Per Executive Orders (EO) 125-125A, the responsibility over the conduct of board examinations was transferred to MARINA. However, this has not yet been implemented.

c) Creation of a Technical Panel on Maritime Education

A Technical Panel was created under the Bureau of Higher Education (BHE) - DECS. The panel is composed of the DECS, PAMI, MARINA, CISO, CMIP, PCG, PRC and POEA. The BHE, by virtue of E.O. 117 issued on 30 January 1987, is mandated to develop, formulate, and evaluate programs, projects and educational standards for higher education.

Recently, a Maritime Education Plan was formulated focusing on the enhancement of institutional productivity (i.e., accreditation, establishment of zonal centers, continuing education, finance and logistical support and research and development).

d) Enriched Guidelines, Policies and Standards for Maritime Education - DECS

Per DECS Order No. 38, Series of 1991 issued on 01 April 1991, the guidelines, policies and standards for the maritime education program were improved in line with the requirements of the international Standards of Training, Certification and Watchkeeping (STCW) of seafarers. The move was a collaborative effort between the DECS and the collegial body of experts in maritime education.

1.6 Points of Issue

From existing papers and site visitations, the following problems or points of issue were noted:

a) Most schools are lacking in modern equipments/facilities and reference materials;

b) Due to the lack of practical necessary equipments, students seem to have little discipline;

c) Most private schools encountered difficulty in sending students for apprenticeship (on board training);

d) Teaching staff's lack of training for modern technology;

e) There are too many maritime schools but not enough facilities and equipment to meet the minimum required standards of STCW -IMO;

f) Poor training and working conditions in interisland shipping;

g) Lack of government support to domestic shipping unions with regard to workers' welfare and benefits;

h) Failure of most schools to comply with the minimum required standards of the STCW - IMO;

i) Vessels plying the domestic route are considerably old thus requiring an enormous amount of skill and technical know-how;

j) High-rate of turn-over of experienced ratings and officers from domestic to overseas shipping; and,

k) No consideration for safety of small-scale fishermen.

1.7 Improvement Plan

An improvement plan for both the formal and non-formal education has been formulated to institutionalize safeguards for inter-island shipping and to hopefully respond to the aforementioned issues on a short and long-term bases.

1.7.1 Short Term Plan (1992-1995)

a) To upgrade training equipments and facilities in maritime schools (101)

The Enriched Guidelines, Policies and Standards (EGPS) for the Maritime Education Program by the Bureau of Higher Education (BHE) and the Technical Panel on Maritime Education (TPME) both under the jurisdiction the Department of Education, Culture and

Sports (DECS) should strictly and substantially improve training equipment and facilities to minimum standard requirements of the STCW - IMO. Aside from the expeditious enforcement and implementation of the EGPS, strict monitoring/ assessment and facility check should likewise be undertaken by the DECS and other government or private agencies concerned.

There is further need for government to subsidize the facility/equipment needs of maritime schools particularly those which have little capital outlay for the purpose. It may also provide support in terms of making representations with shipping companies and shipyards for unserviceable machinery and equipment which can serve for amiliarization/ orientation purposes. Likewise, it can facilitate the purchase of textbooks and other reference materials which are usually unavailable in the local market. Most schools have suggested that since the government thru the DECS has issued requirements per the EGPS dated 01 April 1991, it must also provide the corresponding logistical and administrative support in the special cases above-mentioned.

b) Streamline the size of student enrollment to raise education and training standards to a level of efficiency and effectiveness. (102)

The current number of maritime schools and training centers (65) is too much. Per the SHIPDECO report, a maximum of 30 schools is enough to provide the nation's seafarers. For SY 1988-1989, of the total graduates from maritime courses, only 35% graduated (9,449) and only 33.7% of this total took the PRC board examinations for deck and engineering officers.

An important consideration is to decrease the current teacher/pupil ratio of 1:50 to 1:30. Notably, the NMP consistently limits the number of students per module at 30 to every teacher/instructor. To ensure the quality of education, NMP accommodates 24 students per module as far as possible.

Further, the number of schools may be trimmed down effectively through a system that would categorize whether these schools are viable and sustainable. The system shall involve the PRC (i.e., a periodical report on the performance of all maritime schools in the board examinations), and MARINA (i.e., evaluation of the standards, facilities and performance of schools and training centers). All recommendations shall be submitted to the Bureau of

Higher Education (BHE)- DECS.

c) Formulation of a curriculum for Apprenticeship (103)

The current apprenticeship system deprives would-be seafarers of their privilege to learn the applications of theories in school. In most cases, apprentices are accepted by shipping companies which do not have the appropriate curriculum for sea board training. As a result, these students end up doing cheap labor instead of undergoing rigid training on basic seamanship.

In the face of an impending crisis, the government through the DECS must institutionalize the appropriate and relevant sea-training curriculum in line with the existing shipboard training program.

d) Teaching staff and seafarers to be re-trained (104)

The lack of highly qualified teachers further compounds the problem of qualified seafarers. It must be noted that not all graduates of degree courses for deck and engineering are qualified to teach. Highly skilled teaching staff are products of an educational system which has the necessary support mechanisms for re-training and skills-upgrading with the aid of newly developed technology.

The National Maritime Polytechnic (NMP) has concluded two (2) 3-week courses this year. Each course has accommodated 48 participants to the Maritime Trainers' Training Program (MTTP) which is designed to develop teaching effectiveness and hands-on training on equipment operation.

It is recommended that the program be strengthened through a partnership with maritime schools and shipping companies.
The NMP can continue conducting two (2) 3-week courses per year provided that a cost-sharing agreement can be forged in view of the high costs of training coupled with the problem of limited funding.

e) Certificate of Competency (CC) to be issued to seafarers manning 35 GRT vessels and below (105)

An amendment to the PMMRR and PCG Memorandum Circular No.01-87 is deemed urgent as these issuances do not require Masters &/or Chief Engineers to be holders of CCs. This move shall ensure safety of life at sea since it is presumed that Masters&/or Chief Engineers who are issued a CC have undergone training courses on Basic Navigation and Seamanship, Personal Survival

Techniques, Engine Handling, etc., which are necessary to handle a small vessel.

f) Safety Information Drive through non-formal means(106)

Non-formal maritime education may be composed of two entities, namely: a) the volunteers or auxiliaries who may do the information drive, and b) the communities near disaster prone areas, so that they can be more readily mobilized for rescue work.

The plan is to reactivate existing auxiliary corps and actively involve the local governments in the safety information drive.

The information drive shall be spearheaded by MARINA, PCG, & the Philippine Information Agency (PIA) in coordination with the Bureau of Non-Formal Education - DECS, DILG, and Non-Governmental Organizations (NGOs).

1.7.2 Long Term Plan (1996-2010)

a) Subsidiary to trainees of M.S. Filipinas (107) and three (3) training ships (108) and new organization to possess training ships (109)

The M.S. FILIPINAS, originally designed for training purposes, has all the training amenities for sea-board training. However, the prohibitive costs for maintenance and operations has converted its use from a training ship to a commercial bulk carrier only.

Subsidiary to utilize M.S. Filipinas for training purpose should be first. It includes meal costs, allowance and travel expenses of trainees but not for her operation and maintenance costs

In succession to subsidiary to trainees of M. S. Filipinas, three (3) additional ships be provided. Considering that each training ship may conduct two (2) training courses annually with a capacity of 240 cadets per training, about 1,920 cadets will be trained annually. This total comprises nearly 58% of the number of trainees (3,300) required annually.

The plan envisions to train all graduates of maritime schools irrespective of category (i.e., public or private). All 3 other training ships shall have organic teaching staff. This arrangement is patterned after the M.S. Filipinas.

To adequately support and sustain the training ship operation establishment of new organization is

recommended.

b) Structural Reorganization (110)

The following measures are recommended:

(1) The DECS must take the lead role in the policy formulation and implementation aspects of maritime education and training. Further, the following must be merged in view of similar policy objectives enunciated by both entities:

- o The Maritime Training Council (MTC) created by virtue of LOI 1404 is chaired by the Department of Labor and Employment (DOLE) with the following members: DECS, NEDA, MARINA, PCG, PAMI, AMOSUP, PMMA, DOF, and the Filipino Shipowners Association.

- o The Technical Panel for Maritime Education (TPME) which is under the administrative supervision of the Bureau of Higher Education consists of the following members: PAMI, MARINA, CISO, PCG, PRC, POEA, & the Chamber of Maritime Industries.

(2) The DOLE must take the lead role in maximizing the employment of Filipino seafarers. It must be the policy-formulating and implementing body with regard to manpower placement/deployment.

(3) MARINA must assume a support role and not the lead role in the evaluation of the capability of maritime institutions including the PMMA.

However, it must retain its function of maintaining and developing a reservoir of trained manpower in close coordination with the DECS and the DOLE. It must take a more active role in the conduct of pre-employment training programs.
With regard to the issuance of licenses to qualified seamen, it appears that MARINA merely acts as an endorsing entity. The technical aspect is solely vested on the PRC.

c) Community- based Education (111)

In the long run, information dissemination efforts will require more funding from the government to strengthen community organizing activities in disaster-prone areas. The partnership to be forged anew with NGOs and other private volunteer organizations should have self-sustaining features.

(1) Orientations/Seminars on safety of life at sea and

disaster preparedness to be formulated by the Bureau of Non-Formal Education - DECS and jointly undertaken by the concerned local government units (LGUs) and municipal disaster coordinating councils (MDCCs) - Office of Civil Defense (OCD) in the areas.

(2) Develop self-reliant communities through community-organizing and community development activities. The concept of self-reliance is anchored on the vision of empowering individuals to become fully aware of their environment through value-formation, skills training and orientation/group dynamics.

(3) Monitor these communities on a regular basis to determine the extent of improvement brought about by the abovementioned activities in terms of beneficiary awareness and value inculcation. The monitoring activity will also assist government officials in further assessing the needs of these communities.

1.8 Cost Estimates

Project costs are estimated in 1991 fixed price. Changing rates are assumed as at 1:27 for US$ to Pesos and at 5:1 for Japanese Yens to Peso.

1.8.1 Short Term Improvement Plan (1992-1995)

a) To upgrade training equipment & facilities in maritime schools

In order to fulfill the requirements stipulated in the 'enriched guidelines' policies and standards (EGPS) for the maritime education program by the bureau of higher education (BHE) and the technical panel on maritime education (TPME), the following investments should be necessary at each school.

(BSMT COURSE)

-Navigational Equipments	
Major Navigation Equipments	P 1,600,000
Gyro Compass	
Magnetic Compass	
Radio direction Finder	
Radar	
Sonar or Echo Sounder	
Satellite Navigator	
Auxiliary Navigation Equipment	P 200,000
Azimuth Circle	
Weather Observation Equipments	

Rulers, Etc.

-Seamanship Equipments

Major Equipments P 1,600,000
Lifeboat with Davit
Inflatable Life Craft
Windlass
Capstan (Wooden/Metal)
Benches with Vices

Seamanship Accessories P 200,000
Sea Anchors Etc.

Seamanship Mimic Diagram / Chart or Prototypes
Models P 200,000
Union Purchase System
Heavy Lift
Etc.

-Maritime Communication Equipments

Radio Equipments P 300,000
VHF Unit
Morse Code Key (with sound and light system)

Visual Signaling Equipment P 100,000
Semaphore Flags
Alphabetical Flags
Etc.

-Navigation Charts and Instruments P 200,000
Mercator Charts
Nautical Almanac
Tide Tables
Star Charts
Etc.

Subtotal P 4,400,000

(B.S. Mar E. COURSE)

-General Lab/Shop Tools P 1,000,000
Files, Hammers, Chisels,
Pliers, Screw Drivers
Wrenches, Cutting Tools,
Threading Tools, Clamp and Holding Devices
Protective Equipments, Power Hands Tools
Measuring Instruments,
Accessories & Attachments

-Machine Shop Equipments P 1,000,000
Bench Works, Tinsmithing & Forging
Machine Shop Practices
Welding Practice

-Internal Combustion Engine Laboratory P 500,000
Main Diesel Engine (50 Hp) with Spares
Aux. Units & Cut-Away Engine Assembly
Flip charts/Slides/Transparencies

-Steam Engineering And Aux. Equipments P 800,000
Steam Plant Machinery with Boiler, Steam Turbine
or Reciprocating Steamengine, Evaporator Etc.
Aux. Unit & cut-away Engine Assembly

Flip Charts/Slides/Transparencies

-Refrigeration & Air Conditioning P 800,000

Ice Making Unit or Refrigeration Trainer

Aux. & Cut-Away Assemblies of Compressor and Air Conditioning Unit

Flip Charts/Sliders/Transparencies

-Electrical Engineering and Electronics Requirements P 1,200,000

Basic Electrical & Electronics Training Module-Operational with Ammeter, Voltmeter, Capacitor, Resistor, Junction Diode, Connection Wires, Fuses and Switches

AC-DC Machinery (Motor Generator Set)

Electrical & Electronics Equipment

Oscilloscope, Oscillators, Radio Transceiver, Condenser Tester, Digital Voltameter

Aux. Unit (non-operational)

Generator Assembly, Motor Assembly, Wire Splices, Wire & Cables Display Board

Flip Charts/Slides/Transparencies

Subtotal P 5,300,000

(Basic Seaman Course)

-Machinery & Power Tools P 400,000

Marine Diesel Engine (25Hp)

Gasoline engine (10Hp)

Steam Plant with Complete Units

Welding set

-Hand Tools P 200,000

-Basic Electrical & Electronics P 200,000

Basic Electrical & Electronics Training Module

AC-DC Machinery (Motor Generator Set)

-Cut Away Assembly & Instructional Aids P 200,000

Piston, Connecting Rods, Crank Shaft, Injection Pump, Pumps Assembly

-Deck Machinery & Seamanship & Stewardship requirements P 1,200,000

Nautical Equipment

Magnetic Compass, Gyro Compass, Sextants

Chart Room Requirements

Seamanship Requirements

Mooring Lines, Etc.

Audio Visual Signaling Equipments

Steward Training Requirements

Subtotal P 2,200,000

BSMT Course and B.S. Mar. E Course are planned to lessen to 30 schools and BSC course to 15 schools. In line of this plan total investment for upgrading training equipments and facilities in maritime school are calculated as follows:

BSMT Course	P 4,400,000 X 30 Schools	= P	132,000,000
B.S.Mar.E Course	P 5,300,000 X 30 Schools	= P	159,000,000
BSC Course	P 2,200,000 X 15 Schools	= P	33,000,000
Grand Total		P	324,000,000

b) Teaching Staff Retraining

Subsidy to Maritime Trainers' Training Program (MTTP) at National Maritime Polytechnic (NMP) is estimated under the assumption of two courses a year with 48 trainees for a course.

Number of Trainees 48 psns X 2 courses = 96 psns/year

Traveling Fee	P 4,000 X 96	= P	384,000
Boarding Fee with Meals	P 1,000 X 25 X 96	= P	2,400,000
Allowance	P 1,000 X 25 X 96	= P	2,400,000
Tuition Fee	P 3,000 X 96	= P	288,000
Grand Total		P	5,472,000

1.8.2 Long Range Improvement Plan (1996-2010)

a) Financial Assistance (per annum) to utilize M.S. Filipinas as training ship

Number of Trainees 240 psns X 2 courses = 480 psns/year

Meals	P 50 X 180 X 480	= P	4,320,000
Allowance	P 2,500/month X 480 X 6 months	= P	7,200,000
Traveling Expenses	P 3,000 X 480	= P	1,440,000
Grand Total		P	12,960,000

b) Construction and Operation of Three (3) Training Ships

Construction	5,000,000,000yen X 3 vsls =	15,000,000,000yen
Crewing Cost (p.a.)	$ 800,000 X 3 vsls =	$ 2,400,000
Operation Cost(p.a.)	$ 1,500,000 X 3 vsls =	$ 4,500,000

1.9 Implementation Program

Implementation program is fixed with synthetic consideration on level of urgency, of financial possibility and of social consensus of each project. The program is shown in Fig. 1.1.

Proj. Code	Project		Period			
			1992-1995	1996-2000	2001-2005	2006-2010
101	To upgrade training facilities in schools		-----			
102	Streamline the size of student		-----			
103	Formulation of a curriculum for apprenticeships		-----			
104	Retraining of teaching staff and seafarers		-----			
105	CC for seafarers manning 35 GRT vessels and below		-----			
106	Safety information drive through non-formal means		-----			
107	Subsidiary to Filipinas			----------		
108	Construction of Trainingships	1		-----		
		2			-----	
		3				-----
109	Establishment of new organization to possess training ships			-----		
110	Structural Reorganization				----------	
111	Community-based Education				----------	

Fig. 1.1 Implementation Program of Maritime Safety Education

Annex 1.1

PHILIPPINE MARITIME SCHOOLS

Courses Offered

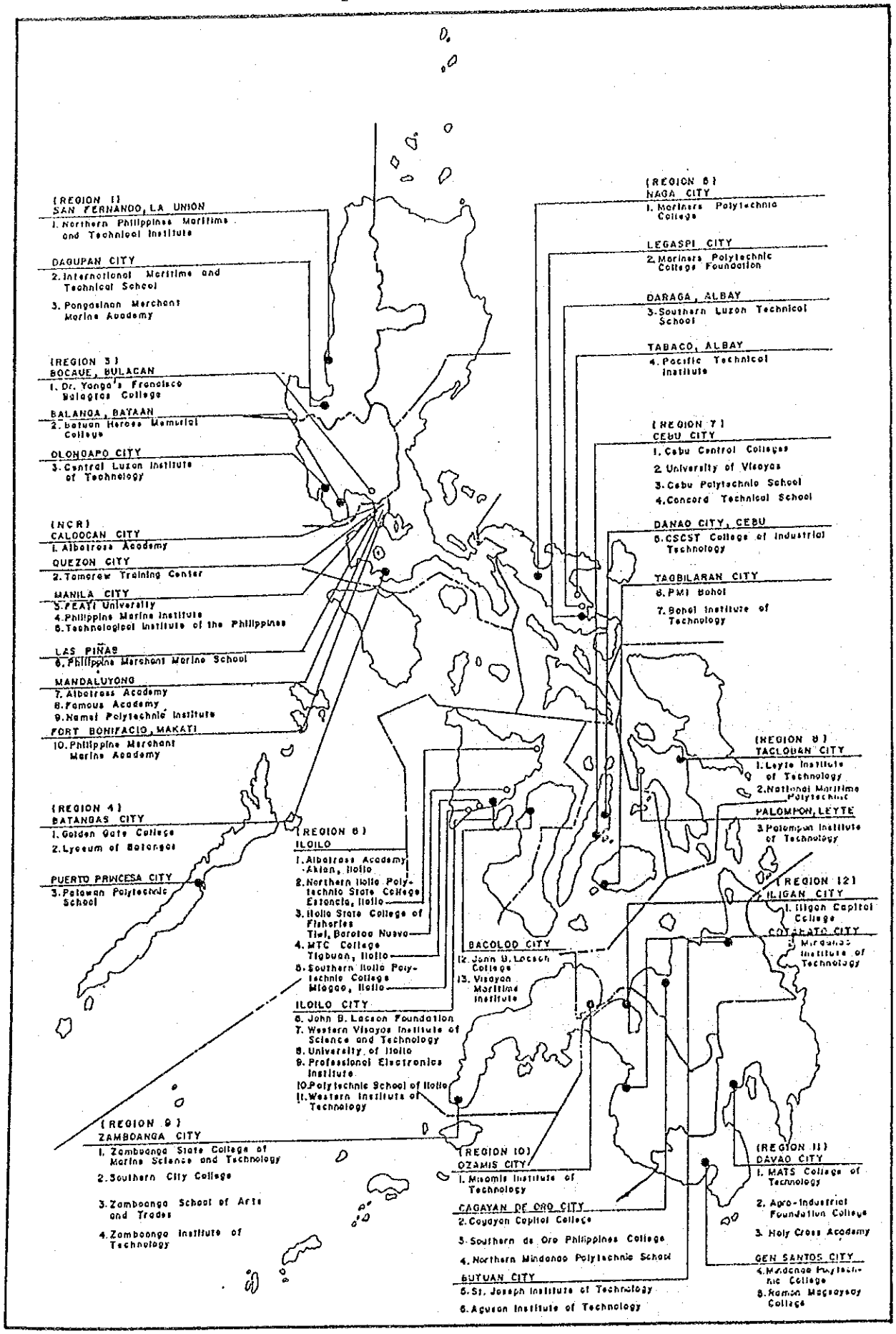
Maritime Schools	Courses Offered					
	BSMT (E)	BSMT (N)	AME	BSC	NAME	Remarks
National Capital Region						
Albatross Foundation Academy (Caloocan/Mandaluyong)	-	-	-	X	-	-
AMOSUP Seamen's Training Center	-	-	-	X	-	-
FEATI University	-	X	X	-	-	-
NAMEI Polytechnic Institute	-	X	X	-	X	-
Phil. Maritime Institute (PMI)	X	X	-	X	-	-
Phil. Merchant Marine Academy (PMMA)	X	X	-	-	-	Govt.
Phil. Merchant Marine School (PMMS)	-	X	X	-	-	-
Technological Inst. of the Phil. Philippines (TIP)	-	-	X	-	-	-
Magsaysay Training Center	-	-	-	X	-	SC
Region I						
Dna J.E.Marcos Foundation (Ilocos)	-	-	-	X	-	-
Intl. Maritime & Technical School	-	-	-	X	-	-
Northern Phil. Maritime & Tech. School	-	-	-	X	-	-
Pangasinan Maritime Academy	-	X	X	-	-	-
Phil. Inst. for Maritime Studies	-	-	-	X	-	-
Region III						
Bataan Heroes Memorial College	-	X	X	-	-	-
Cent. Luzon Inst. of Technology (SFdo)	-	-	X	X	-	-
Dr. Yang's F. Balagtas College	-	-	-	X	-	-
Region IV						
Golden State Colleges (Batangas City)	-	-	X	-	-	-
Lyceum of Batangas	-	X	X	-	-	-
Palawan Polytechnic Coll. (Pto Princesa)	-	X	X	-	-	-
Region V						
Mariners' Polytechnic Coll. (Naga,Lgspi)	-	X	X	X	X	-
Pacific Vocational Institute	-	-	-	X	-	-
Southern Luzon Technical School	-	-	-	X	-	-
Region VI						
Iloilo State College of Fisheries	-	X	-	-	-	Govt.
J.B.Lacson Colleges Found. (Iloilo)	-	X	X	-	-	-
J.B.Lacson Colleges Found. (Bacolod)	-	X	X	-	-	-
MTC College (Iloilo)	-	X	X	-	-	-
University of Iloilo	-	-	X	-	-	Govt.
Visayan Maritime Academy	-	X	X	-	-	-
Western Institute of Technology	-	-	X	-	-	-

Maritime Schools	Courses Offered					
	BSMT (E)	BSMT (N)	AME	BSC	NAME	Remarks
Region VII						
Cebu Central Colleges	X	X	-	-	X	-
Cebu Polytechnic School	-	X	-	-	-	-
CSCST College of Ind. Technology (Cebu)	-	-	X	-	-	Govt.
PMI College (Bohol)	-	X	X	-	-	-
University of the Visayas (Cebu)	-	X	X	-	-	-
Abellana National School (Cebu)	-	-	X	-	-	-
Region VIII						
Leyte Inst. of Technology (Tacloban)	-	-	X	-	-	Govt.
Palompon Inst.of Technology (Tagbiliran)	-	X	X	-	-	Govt.
National Maritime Polytechnic (Tacloban)	-	-	-	-	-	SC, Govt.
Region IX						
Zamboanga Polytechnic Institute	-	-	-	X	-	-
Zamboanga School of Arts & Trade	-	-	X	-	-	Govt.
Zamboanga State College of Marine Sciences & Technology	X	X	-	-	-	Govt.
Region X						
Cagayan Capitol College	-	X	X	-	-	-
Iligan Capitol College	-	X	-	-	-	-
Misamis Inst. of Technology (Butuan)	-	X	X	X	-	-
Southern Philippine Academy	-	-	-	-	-	-
St. Joseph Inst. of Technology (Ozamis)	-	X	X	-	-	-
Agusan Inst. of Technology (Butuan)	-	X	X	-	-	-
Region XI						
Agro-Industrial Found. College (Davao)	-	X	X	X	-	-
MATS College of Technology (Davao)	X	X	-	X	-	-
Region XII						
Mindanao Polytechnic Coll: (Gen.Santos)	-	X	X	X	-	-
Mindanao Inst. of Technology (Cotabato)	-	-	X	X	-	-

Notes

BSMT(E) Bachelor of Science in Marine Transportation (Maritime Engineering)
BSMT(N) Bachelor of Science in Marine Transportation (Nautical Studies
AME Associate in Marine Engineering
BSC Basic Seaman Course
NAME Naval Architecture & Marine Engineering
Govt. Government School
SC Special Courses only, no degrees

Annex 1.2
Locational Map of Maritime Schools Nationwide



Annex 1.3
COMMENTS ON FORMAL MARITIME EDUCATION

The following are the findings and the comments of the JICA expert team that visited some maritime colleges, institutes, and training centers. The team also interviewed some shipping associations and companies, regarding certain aspects of the maritime industry. The first part of this annex reports on the visits and the findings of the team, while the second part discusses some findings, gathered during the interviews with the representatives of the shipping industry.

1. MARITIME COLLEGES/INSTITUTES/TRAINING CENTERS

1.1 Technological Institute of the Philippines (TIP)

TIP is located in the heart of Manila, within the university belt. It offers courses in civil engineering, chemi-cal engineering, electrical engineering, mechanical engineering, architecture, accounting, commerce, drafting technology (one year), and computer technology (one year). It also offers a two year course, leading to a degree in Associate in Marine Engineering, and a four year course, leading to a Bachelor of Science in Marine Engineering.

It was observed that, despite the numerous maritime and engineering courses offered, effective learning tools have yet to be institutionalized. At present, there are about 400 students taking the course leading to a B.S. in Marine Engineering.

1.2 NAMEI Polytechnic Institute (NPI)

NPI is likewise situated within the university belt. It offers the following courses:

- Bachelor of Science in Naval Architecture & Marine Engineering,
- Bachelor of Science in Mechanical Engineering,
- Bachelor of Science in Electrical Engineering,
- Bachelor of Science in Marine Transportation, Major in Nautical Science, and
- Associate in Marine Engineering.

NPI has an enrollment, in the marine courses, of around 150 students (with a maximum of 45 graduates per year). For nautical classes, it has equipment, such as a magnetic compass, several sextants, azimuth mirrors, and a repeater compass of a gyro compass. It also has samples of anchor chains, bollards, and rope

knots. For engine classes, it has a lathe machine, a milling machine and hand tools.

Also, the institute offers a seven (7) day on-board practicum with some interisland shipping companies. NPI seems to be well organized and its students well disciplined. However, more appropriate facilities and equipment should be made available to the students .

1.3 MATS College of Technology (MCT)

MCT was established in 1976 and is located in Davao City. The maritime courses offered are:

- Bachelor of Science in Marine Transportation (BSMT)
- Associate in Marine Engineering (AME)
- Bachelor of Science in Naval Architecture (BSNA)
- Basic Seaman Course (BSC, a 6 month course)

There are about 1,500 to 2,000 students enrolled in these maritime courses. The following training equipment are studied and are available for classes in navigation:

- Several sextants
- Chronometer
- Gyro repeater
- Magnetic compass
- Decca radar with scanner (not functional)
- Rope knots display boards

Apparently, the facilities and equipment available are not suitable nor sufficient to service the training needs of such a large student population.

1.4 Agro-Industrial Foundation College (AIFC)

AIFC is also located in Davao City. The maritime courses offered are:

- B.S. in Marine Transportation
- Associate in Marine Transportation
- B.S. in Marine Engineering
- Basic Seaman Course

At present, there are about 1,500 students attending the maritime classes. For nautical classes, the following equipment are available:

- Rock bridge with radio direction finder
- Mercurial barometer

- Several sextants
- Rope knots displays

For engine classes, the following equipment are available:

- One Kubota marine engine (270 horsepower)
- One small lathe
- Gas and electric welding equipment

This college also lacks the equipment necessary to attain the minimum required standards of the STCW.

1.5 National Maritime Polytechnic (NMP)

NMP is situated in Tacloban City, Northern Leyte. It was established in 1978, as a joint project of the Government of the Philippines (GOP) and the Japan International Co-operation Agency (JICA), and subsidized by the Japanese government. The primary objective of NMP is to conduct specialized courses in a wide range of disciplines for seafarers, as well as for students, who undergo training in other schools throughout the country.

The institute is under the jurisdiction of the Department of Labor & Employment (DOLE). The available equipment and instruments are appropriate to the latest maritime technology. This institute provides the following courses:

1.51 Specialized Courses

- Tanker Safety Course (TSC)
- Tanker Operating Course (TOC)
- Radio telephony/INMARSAT system
- Inert gas system/crude oil washing (IGS/COW)
- Handling/carrying dangerous/hazardous cargo, other than bulk (SSCD/HCB)

1.52 SOLAS Courses

- Maritime leadership and behavioral development (MLBD)
- First aid at sea (FAS)
- Firefighting (FF)
- Proficiency in survival craft (PSC)
- Survival at sea (SAS)

1.53 Deck Section Courses

- Electronic navigation system

- Ship handling and maneuvering
- Radar observer course
- Radar simulator course
- Automatic radar plotting aid
- Marine meteorology
- Practice of navigation / aids to navigation
- Ship's trim and stability
- Safe cargo handling and stowage

1.54 Engine Section Courses

- Electrotechnology
- Modern marine propulsion system
- Marine electricity
- Auxiliary system
- Control engineering
- Steam plant & 4-stroke diesel engine
- Hydromechanics
- Refrigeration & airconditioning
- Marine electronics

1.6 Cebu Central Colleges (CCC)

CCC is situated in central Cebu City, in the central Vi-sayas (Region VII). The courses offered, on maritime studies, are:

- B.S. Marine Transportation
- B.S. Naval Architecture
- Special Training Courses (e.g., ROC, SOLAS)

The College has a population of about 5,000 students in the maritime courses. It is observed that CCC has modern and serviceable equipment, plus the corresponding qualified lecturers.

1.7 Concord Technical Institute (CTI)

CTI is also situated in Cebu City. It was not visited, although an interview with its President, Mrs. Vicenta Ty, was conducted. This institute offers B.S. in Marine Transportation (BSMT). It was observed that there is much improvement to be made, with regard to the installation of training facilities and equipment.

1.8 John B. Lacson College Foundation

Formerly known as the Iloilo Maritime Academy, the J.B.L. College Foundation is located in the center of Iloilo City. It is a non-profit organization; whatever revenues are derived

from tuition fees are utilized for its operations and the improvement of facilities. The courses offered are:

- B.S. in Marine Transportation, Major in Nautical Science
  & Marine Engineering
- B.S. in Customs Administration
- Maritime High School
- STCW/CMEP Training
- Upgrading & technical marine courses (e.g. Tanker Course, Bridge Watchkeeping, Marine Electrotechnology, Engine Room Watch, etc.)

The foundation has very strong tie-ups with some shipping companies for on-board (apprenticeship) training. There are adequate training facilities and equipment. To date, it has accommodated a total of about 4,600 students, and has deployed about 500-600 graduates every year.

1.9 Philippine Merchant Marine Academy (PMMA)

The academy was established in 1820 and was then known as the Philippine Nautical School (PNS). By virtue of RA 3680, passed in 1963, the PNS was renamed the Philippine Merchant Marine Academy and, as such, was mandated "to provide higher maritime technological, professional, vocational education and training for a sea career".

To maintain its lead role, as a valuable source of disciplined and quality seafarers, the PMMA has utilized a dualistic approach towards education. It strongly emphasizes academic excellence, value orientation, and skills training. The courses offered by PMMA are:

- B.S. Maritime Transportation (BSMT), major in Steam Engines and Electrical Engineering
- B.S. Maritime Transportation (BSMT), major in Navigation & Seamanship
- Other courses, such as
  - Radar Simulator Course
  - Radar Observer Course 454
  - Basic Electronics (BE)
  - Drawing Schematics (DS)
  - Basic Process Technology (BP)
  - Oil Tanker Course
  - Chemical Tanker Course
  - Officer Refresher Course
  - Dual Crew Training Course

A new curriculum was introduced in 1990, which requires each student to complete 36 units (i.e. a 4 year course, with 3 years in school and 1 year at sea). It further provides a residency program (6 days a week) with emphasis on the attitudinal aspect. The first 3 years consist of shipboard duty to ensure sea wise, alert, and highly motivated seafarers. The fourth year consists of actual applications of all the theories previously studied.

The academy superintendent, Commodore Gil Fernandez, informed that, by the year 1993, a post-graduate course would be offered. Moreover, a maritime high school (focusing on arts and sciences and preparatory for a collegiate course) is being worked out, as a joint effort between the PMMA & NAMEI.

For the last ten years (1980-1990), the PMMA has produced 1,087 BSMTs/Third Mates, and 700 BS Marine Engineers/ Fourth Marine Engineers. These figures represent 19.86% and 14.58% of all graduates, relative to the enrollment for BMST and BS Marine Engineering, respectively.

This Academy is fully equipped with modern facilities and equipment. Training rooms are appropriate for theory application and its library houses an array of textbooks and reference materials, most of which are donations from foreign institutions.

1.10 Palawan Polytechnic College (PPC)

PPC was established in 1979 in Puerto Princesa, Palawan, as a branch of the MATS College of Technology. Due to its strategic location (i.e. it is accessible to the maritime cities of Cebu and Iloilo and to the Palaweños, many of whom are fisherman), it aims to develop the natural talents and tendencies of Palaweños and ultimately improve their living conditions.

There are only about 45 students admitted to the Bachelor of Science in Maritime Technology (BMST) course. The re-maining applicants are advised to take up other technical courses. As observed, the PPC facilities are unserviceable and very outdated and may be used only for familiarization. There is an absence of special tools and instruments for the application of theory.

PPC graduates, like most other marine

graduates, opt for international routes, for financial and practical reasons. Moreover, PPC has an arrangement with a manpower agency in Manila which facilitates the processing of graduates/ applicants for employment abroad.

1.11 Philippine Seafarers Training & Review Center (PSTRC)

The PSTRC offers the following special courses:

- Review for Marine Deck/Engine Officers
- Watchkeeping for Deck Engine

It also conducts training on

- Firefighting/fire prevention
- Personal survival techniques
- First aid at sea and lifeboatmanship
- Tanker safety
- Radio telephony

While the school is in Manila, practicum exercises, in firefighting, survival craft, lifeboatmanship, personal survival techniques, first aid at sea, and other similar courses are conducted in separate sites in Laguna, where suitable and practical facilities are available.

1.12 Golden Gate College (GGC)

The college is located in the heart of Batangas City, in the province of Batangas, south of Metro Manila. Courses, leading to the following degrees, are presently offered:

- Certificate in Marine Engineering (CME)
- B.S. in Marine Engineering (BSME)
- Associate in Marine Engineering (AME)
- Basic Seaman Course.

The CME degree, if pursued further, can lead to a BSME degree. GGC produced 40 BSME graduates for the school year 1990-1991. For CME and AME, there were 200 enrollees. Facilities and equipment are suitable for familiarization and/or orientation purposes only. Their graduates are de-ployed, for interisland apprenticeship, through arrangements with shipping lines and manning agencies in Metro Manila.

1.13 Lyceum of Batangas

The institution is located less than one

kilometer away from the Golden Gate College. It offers the following maritime courses:

- B.S. in Customs Administration
- B.S. in Marine Engineering
- Basic Seaman Course

GGC has a total of 900, 1000 and 200 enrollees, respectively, in the above courses. It has a sufficient number of teachers who are mechanical engineers and civil engineers, and who were Masters, Chief Engineers, and Chief Mates by profession.

In line with DECS standards and with its academic objectives, the school administrators are planning to acquire one (1) training ship, either from donations or from grants. The school registrar informed that certain DECS requirements (e.g., facilities, textbooks) are either too expensive or are not available.

1.14 AMOSUP Training Center

For the past fifteen (15) years, AMOSUP has provided training and upgrading services to its union members, who are required to pay annual fees in exchange for a wide range of services. These services include training fee discounts and cooperative and hospital privileges. The training center offers courses on:

- Radio observers course
- Basic tanker safety
- Oil tanker safety
- LPG/LNG tanker safety
- Chemical tanker safety
- Deck watchkeeping
- Engine watchkeeping

1.15 Magsaysay Training Center

The center was established in 1970, as an upgrading institution, which offered courses to meet or exceed global standards in maritime training. The courses offered are:

- Radio observation & plotting
- Radar simulator
- Automatic radar plotting aids
- Radio telephony
- Basic firefighting
- Tanker safety

- Basic stability

MTC has a wide range of modern training equipment, including:

- Norcontrol navigation simulator
- Sulzer training engine
- 20 booth language laboratory
- Machine workshop
- FRAMO cargo pump system
- Tanker safety laboratory
- Refrigeration & airconditioning workshop
- Microcomputer classroom

1.16 NYK-FIL Training Center

The NYK-Fil training center was established in July 1989, to provide the best seamen and other sea based personnel. It is fully equipped with modern training facilities, including:

- INMARSAT
- Satellite navigator
- Weather facsimile
- Stability computer
- Various engines, machinery, and accessories.

It boasts of a five level building, called the Casa Marinero, which was designed for training cruises and tanker vessel personnel. Casa Marinero is equipped with the most modern tanker and inert gas system (IGS) simulator equip-ment, an 80 bed dormitory for trainees, a fine restaurant, a multi-purpose social hall, a trainees canteen, and even a barber shop. NYK-FIL has a battery of well-trained, highly competent and technically qualified staff for the training of crews and cadets.

2. SHIPPING ASSOCIATIONS/SHIPPING COMPANIES

Three associations and companies were interviewed to gather their comments and opinions on the maritime shipping industry. These included William Lines in Manila, Negros Navigation in Manila, and some CISO members in Davao City. The following main points and issues were gathered from the officials of the abovementioned companies.

2.1 Crew Tenure

Generally, seafarers working in the domestic shipping industry remain with the company for from 10 to 20 years. Some companies have

problems with the rather high rate of turnover, mostly in terms of well experienced crew members transferring to overseas vessels.

2.2 On-Board Training

The fairly large companies, such as the CISO members, are constantly accepting apprentices from maritime schools, for training on-board their vessels, on the basis of "on the job training".

2.3 Benefits/Welfare

There is a lack of government assistance and support to domestic shipping unions, with regard to their benefits and welfare.

2.4 Spare Parts

A common problem, among companies, is the lack of a consistent supply of spare parts for ship maintenance. This scarcity is due to the high import taxes which makes it difficult to locate locally available parts.

2.5 Overaged Vessels

Almost all vessels engaged in domestic service are considerably old. This means that higher levels of techniques are required of the crew and the shorehands, for the maintenance and operation of these vessels.

Annex 1.4
PERFORMANCE OF MARITIME SCHOOLS
IN PRC EXAMINATIONS, 1987-1990

	MAST MARN	CHF MATE	2nd MATE	3rd MATE	MAJ PATR	MIN PATR	CHF MAR	2nd MAR	3rd MAR	4th MAR	MTR ENG
January 1990											
No. of Examinees	185	347	618	975	47	6	169	335	663	1069	-
No. Passed	92	178	3211	518	32	6	123	196	398	579	-
% Passed	50%	51%	52%	53%	68%	100%	72%	58%	60%	54%	-
September 1989											
No. of Examinees	58	117	179	537	24	-	55	116	221	590	-
No. Passed	40	75	116	322	20	-	30	44	54	233	-
% Passed	69%	64%	65%	60%	83%	-	55%	38%	24%	39%	-
July 1989											
No. of Examinees	134	276	498	941	23	5	126	246	495	866	3
No. Passed	78	141	288	390	11	5	78	110	239	363	0
% Passed	58%	51%	57%	41%	47%	100%	62%	45%	48%	42%	0%
January 1989											
No. of Examinees	115	188	341	628	35	4	93	194	364	572	-
No. Passed	38	71	149	322	12	2	52	79	151	189	-
% Passed	33%	38%	44%	51%	34%	50%	56%	41%	41%	33%	-
July 1988											
No. of Examinees	109	225	328	795	23	1	77	163	354	755	1
No. Passed	36	126	138	425	11	1	33	54	132	221	0
% Passed	33%	56%	42%	53%	48%	100%	43%	33%	37%	29%	0%
January 1988											
No. of Examinees	86	131	239	446	53	8	90	147	285	504	1
No. Passed	58	71	139	222	13	2	45	63	111	180	1
% Passed	67%	54%	58%	50%	25%	25%	50%	43%	39%	36%	100%
June 1987											
No. of Examinees	55	113	174	413	21	3	63	110	193	460	-
No. Passed	23	36	64	147	4	1	25	27	46	377	-
% Passed	42%	32%	37%	36%	19%	33%	40%	25%	24%	82%	-
February 1987											
No. of Examinees	93	148	262	556	76	7	96	188	302	652	-
No. Passed	25	43	73	140	20	4	49	92	149	183	-
% Passed	27%	29%	28%	25%	26%	57%	51%	49%	49%	28%	-

Notes

MASTMARN	Master Mariner	CHFMAR	Chief Marine Engineer
CHFMATE	Chief Mate	2NDMAR	Second Marine Engineer
2NDMATE	Second Mate	3RDMAR	Third Marine Engineer
3RMATE	Third Mate	4THMAR	Fourth Marine Engineer
MAJPATR	Major Patron	MTRENG	Motor Engineer
MINPATR	Minor Patron		

2. FLEET IMPROVEMENT FOR SAFETY

2.1 Present Situation

2.1.1 Shipbuilding and Shiprepairing Industries

a) Facilities

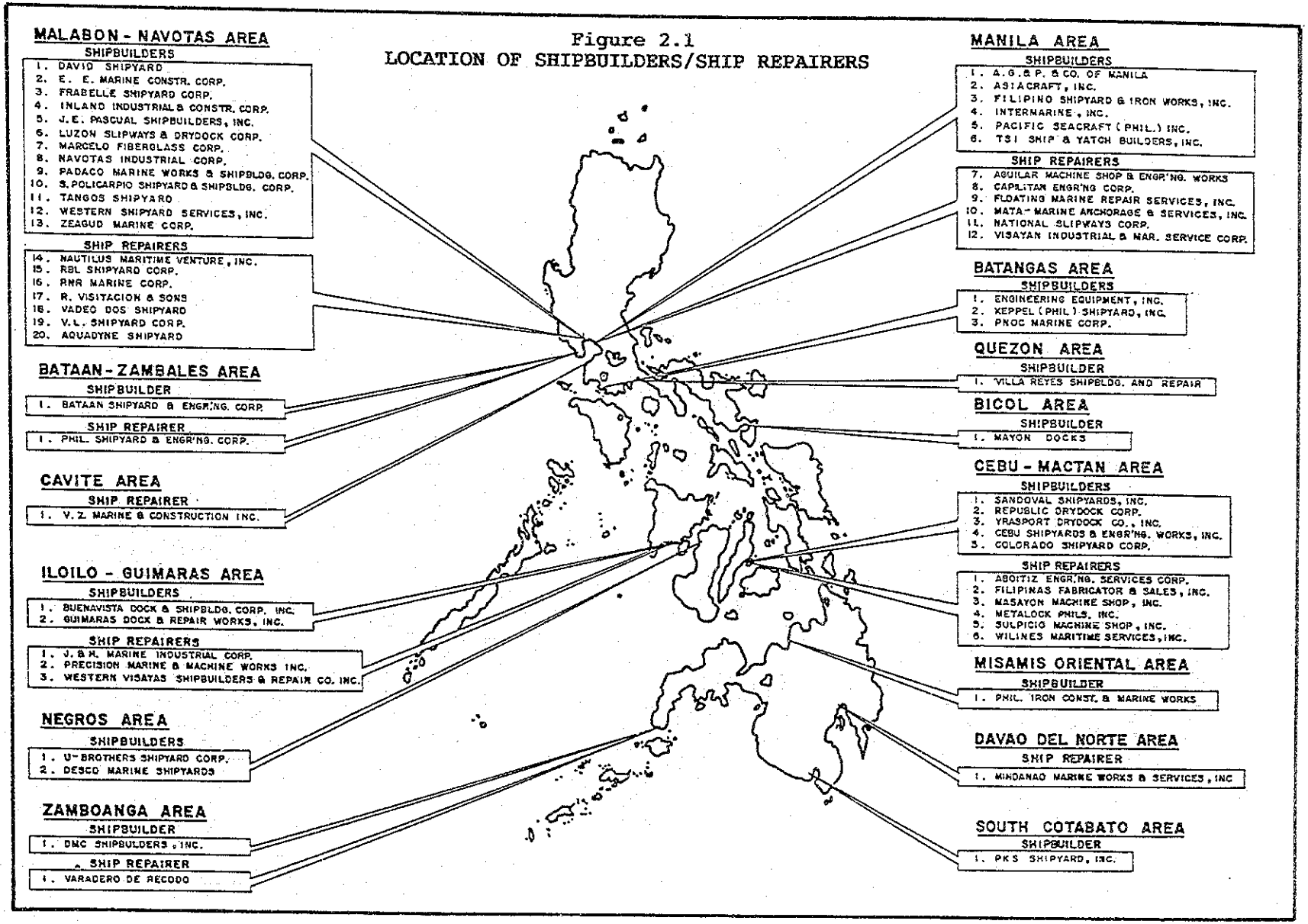
There are 63 companies registered with MARINA as shipbuilders and repairers as of early 1991. The locative distribution of the companies is presented in Figure 2.1 and a detailed listing is given in Annex 2.1. Majority of these owns smaller yards engaged only in repairs and/or conversion of smaller vessels servicing the interisland transport. Six (6) major companies namely Atlantic Gulf and Pacific Inc. (AG&P), Keppel Philippines Shipyard Inc. (Keppel Batangas), PNOC Dockyard and Engineering Corp. (PNOC), Philippine Shipyard and Engineering Corporation (PHILSECO), Cebu Shipyard and Engineering Works, Inc. (Keppel Cebu), and Philippine Iron Construction and Marine Works (PICMAW) are of larger scale and capable of constructing new ships and repair of larger ships.

Ocular inspection on three (3) large shipyards namely PHILSECO, PNOC Dockyard Engineering Corp. and Keppel Cebu revealed that the shipyards are fully and adequate equipped, capable of simultaneous shipbuilding and repairs. Layout of the shipyards are shown in Annex 2.2 - 2.4. The shipyards appeared busy but shipbuilding activities were on a stand still. Materials and outfittings for shipbuilding and repair works rely on importation and much time is spent waiting for spareparts and materials to arrive from abroad making it difficult for the shipyards to control the schedule and cost for competitive service to the ship owners. Inspections on small shipyards show that equipments and machineries are generally worn out and/or are of the vintage type. For this type of shipyard, shipbuilding activities are done in open space mainly on seashore (see Annex 2.5).

b) Management and Technical Grade

At present, all the major Philippine shipyards are confined to ship repair and hardly any shipbuilding activities have been undertaken. Some years ago, shipbuilders enjoyed duty free importation of steel and equipment under P.D. No. 666 for new-building of ships. In 1984, by virtue of P.D. 1955, tax and duty exemption privileges were withdrawn, but in 1986 as requested by PHILSAR this incentive was restored as per FIRB Resolution no. 3-86 and implemented by MARINA

Figure 2.1
LOCATION OF SHIPBUILDERS/SHIP REPAIRERS



Memorandum Circular no. 32. Restoration was granted subject to the condition of a 10-year period of avail of the duty exemption privileges. This period shall be reckoned from the date of registration with MARINA. However, majority of the large shipyards can no longer avail of such provision since they are registered with MARINA for more than 10 years. Shipbuilders and Shiprepairers are subjected to importation duties and taxes amounting to as much as 35%. As a result, newly build vessel prices have soared considerably. Since then ships owners prefer to bring in vessels on a bare-boat charter basis which entails only 4.5 % tax on the charter.

As shown in Table 2.1, the number of shipbuilding activities fell drastically. Shipyard activities shifted from shipbuilding to shiprepairs and conversion. However, the magnitude of said activities is difficult to sustain.

Table 2.1
Number of Locally Constructed Vessels by Type of Vessel

Type of vessel	1982	1983	1984	1985	1986	1987	1988	1989	1990
Barge	41	17	7	1	1	3	2	2	-
Fishing	15	7	-	1	1	-	-	-	-
Cargo	23	5	1	-	-	-	-	3	2
Tug	21	7	3	1	1	-	1	-	-
Tanker	-	3	1	-	-	-	2	3	3
Others	231	95	20	6	3	2	6	1	1
Total	331	134	32	9	6	5	11	9	6

Source : MARINA

In 1980, when ship building was active, the yards employed about 21,000 persons and in 1987 the number was reduced to 3,370. Much of the skilled workers, qualified naval architects and marine engineers have quitted. The lack of skilled manpower would become an issue in the near future.

On wooden hull vessel building , builders are accustomed to build ships without plans. The serious issue is that vessels are not installed with watertight bulkhead. It is a conclusive cause for ship to sink or capsize when damaged and water penetration occurs.

2.1.2 Inspection of Ships

a) Rules and Regulations

The enforcement of ship safety regulations is prescribed in the Philippine Merchant Marine Rules and Regulations (PMMRR).

The purpose of the rules and regulations is to ensure that all vessels of the Republic of the Philippines are so designed, constructed, maintained, operated and inspected as to attain the highest standard of safety of life and property at sea.

The rules are based on SOLAS'60 and copied from foreign regulations, mainly from the U.S. Coast Guard Rules and American Bureau of Shipping rules. The requirements given in the PMMRR are apt to be unrealistic. Amendments and alteration to the rules have been carried out in form of memorandum circulars but they are not well known to the shipping industry.

Presently the rules and regulation are undergoing revision based on an international convention to meet the actual conditions of the Philippines with the cooperation of the parties concerned.

b) Inspection System

For the purpose of unifying the organization on maritime safety, the president has issued E.O. 125/125-A transferring ship inspection from PCG to MARINA. However, inspection of ships are still conducted by PCG with the exception of inspection at the time of application for business license to bare-boat charter and import of second hand ships.

Ship inspections are handled by the Maritime Safety Office (MSO) of the PCG Headquarters and some Maritime Engineers located in the eight (8) PCG District. The following functions relative to vessel inspection are carried out by the MSO:

i) Conduct construction survey to ensure compliance with approved ships plans.

ii) Conduct tonnage measurement of vessel 250 GRT and above.

iii) Supervise the conduct of inclining experiment to ensure compliance of stability criteria.

iv) Verification of passengers accommodation plan to ensure compliance with the required passengers

accommodation arrangements.

The Maritime Safety Office is manned by one (1) officer, five (5) enlisted personnel seven (7) licensed Naval Architect and Marine Engineer, one (1) Mechanical or Electrical Engineer and one (1) Industrial Engineer.

On the other hand, Maritime Safety Engineer in the PCG District performs/undertakes the following types of inspection;

i) Construction survey and Dry-docking survey. (Dry-docking survey is done once a year for passenger vessel and biennial for cargo vessel.)

ii) Verification of loadline mark

iii) Tonnage measurement of the vessels below 250 GRT

iv) Mandatory inspection of the vessels as a requirement in the issuance of "Certificate of Inspection " cover the following ;

* Condition of hull
* Condition of machinery
* Condition of equipments
  - Navigational equipments
  - Fire-fighting equipments
  - Communication equipments
  - Life-saving appliances
  - MARPOL equipment (for tankers)
* Manning requirements
* Ship's documentation

v) Conduct unscheduled Material Readiness Inspection (MRI) of ships to ensure maintenance of seaworthiness at all times

vi) Conduct regular Operational Readiness Evaluation (ORE) of ships during the typhoon season, passenger peak season etc.

The smaller sized Coast Guard Districts have one (1) or two (2) Maritime Safety Engineers while the medium sized Coast Guard Districts have more than two (2) Maritime Safety Engineers. The Prime District, the First Coast Guard District (Manila), has ten (10) Maritime Safety Engineers.

2.1.3 Implementation of Inspection

In the conduct of survey/inspection in the issuance and endorsement of "International Loadline Certificate", the

PCG has accredited internationally recognized Classification Societies namely;

(a) American Bureau of Shipping (AB)
(b) Lloyd's Register of Shipping (LR)
(c) Germanischer Lloyds (GL)
(d) Nippon Kaiji Kyokai (NK)
(e) Bureau Veritas (BV)
(f) Det Norske Veritas (NV)
(g) Registro Italiano Navale (RI)

For the "Coastwise Loadline Certificate", the PCG has accredited four (4) local Loadline Assigning Authorities with their respective authorized surveyors namely ;

(a) Augusto Suzara Jr.
(b) Marine and Industrial Surveyors
(c) J.M. Fernandez and Co.
(d) R.J. Del Pan Mindanao Surveyors, Inc.

Vessels classed with one of the above Classification Societies, should be recognized by the Administration.

All Classification Societies have their own rules for structural design of vessels, together with a system of periodic survey for verification that the vessel's strength and class are properly maintained.

PCG workload would decrease had more vessels undergo classification with the Classification Societies However, too many ships still remain "unclassified". On the other hand, there are no technical standard being followed in the conversion/alteration of second hand ships and construction of wooden hull vessels. As a result, there are a substantial number of substandard ships in the interisland services. Some of them do not have adequate stability and the like. Therefore, inspections seem to have not been effectively done.

2.1.4 Domestic Fleet and Maritime Accidents

a) Domestic Fleet

The domestic fleet is composed of 9,392 vessels in 1989. The number of ships by size and type of service are shown in Table 2.2.

Table 2.2
Number of Ships by Size and Type of Service

Type of Service	Total	Tonnage Group										Average GRT
		3-19	20-49	50-99	100-249	250-499	500-999	1000-1999	2000-4999	5000 --	No Info	
Pass. 1_/ Ferry	420	227	60	46	38	24	8	8	2	3	4	180.35
Pass. 1_/ Cargo	98	6	7	17	13	9	20	7	14	3	2	1004.20
Gen. 2_/ Cargo	2737	1812	427	143	70	125	92	30	32	1	5	116.46
Con- 3_/ tainer	24	--	--	--	--	--	1	10	12	1	-	2607.53
Oil Tanker	117	--	6	14	27	32	15	8	15	-	-	745.77
Fishing - 36.26	4975	3354	892	307	282	112	11	5	1	-		
Others	1021	234	167	103	134	256	113	11	6	-	18	---
TOTAL	9392	5633	1559	620	564	558	260	79	82	8	29	112.53

1_/ Passenger ferry's/passenger cargoes are composed of steel hull and wooden hull vessels and motor banca

2_/ General cargo ships are composed of steel hull and wooden hull vessels, but majority of the steel hull vessel are second hand foreign ships.

3_/ Container ships are mainly steel hull of 500 GRT and above. Such vessels are converted Log Bulk Carriers.

b) Maritime Accidents

Statistics of maritime accidents from 1982-1990 categorized by cause are shown in Table 2.3.

A detailed investigation on maritime accidents is given in Part I of this report. Findings which have distinct bearing on ship safety based on Table 2.3 are as follows:

i) Accidents number is substantially influenced by frequency of raids of typhoons/tropical cyclones and by their tracks. This fact indicates that necessity of weather information itself and of delivery system of it. In addition to these it indicates the importance of appropriate counter measures against typhoon/tropical cyclone.

ii) "Aground", "collision" and "caught fire" are

generally caused by human error. Against these causalities "drifted", "capsized" and "sunk" are regarded as causalities caused by ship quality.

Around 50% of accidents of vessels are of the "drifted", "capsized" and "sunk" type. This fact requires re-inquiry into ship structure, strength, stability and seaworthiness.

As a matter of course necessity of instruments to prevent human cause accident, e.g. navigational instruments, is also re-examined.

iii) According to the maritime accident analysis in MAPMAS, accidents of small vessels (less than 250 GRT) were dominant in number in the year of 1989 and 1990 which are characterized by large number of accidents caused by raid of strong typhoons. Primary causes of accidents of small vessels were "sinking" and "capsizing" not only in high sea condition but also even in a calm sea condition. In other hand causes of accidents of large vessels (more than or equal to 250 GRT) were "agrounding" in both of calm and high sea conditions.

These analyses give lessons that 1) major counter measure for small vessels are to strengthen vessel structure and to increase stability; and 2) for large vessels building up of reliable search and rescue system is strongly recommended in the case of an accident happens.

Table 2.3
Maritime Accidents by Type

TYPE OF ACCIDENT	1982	1983	1984	1985	1986	1987	1988	1989	1990	TOTAL
Drifted	21	8	0	21	38	29	22	28	45	212
Aground	22	19	61	29	46	45	30	37	103	392
Collision	6	5	3	2	21	8	6	20	20	91
Caught-Fire	16	17	10	11	6	8	4	9	10	91
Capsized	20	21	24	25	30	35	32	36	78	301
Sunk	27	20	138	28	29	36	61	92	118	549
Vessel Missing	34	41	51	30	36	33	52	57	47	381
TOTAL	146	131	287	146	206	194	207	279	421	2017

2.2 Identified Problems

Safety operation on the sea requires the following :

(a) Sufficient seaworthiness of ship
(b) Adequate stability of ship
(c) Qualified seamen

In order to achieve this purpose (safety operation), ship is designed carefully, built according to design and repair/adjust periodically to maintain initial quality and designed performance. In addition, the inspection system exists to ensure the seaworthiness and stability of ships. As pointed out from such context, the role of the shipbuilding/repairing industries and inspection system are important.

Present Philippine maritime system, however, do not function in such manner.

2.2.1 Shipbuilding and shiprepairing industries

a) Counter measure in conversion of ships to increase number of passenger

Many ships undergo conversion to increase passenger number. (see Annex 2.6) One specific case of these nature is the Dona Paz accident. The ship Dona Paz is a 2,598 GRT vessel with and original design passenger capacity of 608 and converted into a 1,400 passenger capacity ferry.

On the time of accident the vessel is carrying a total of 1,762 passenger as per PCG report. Unconfirmed report says that it is carrying a total of 4,000 passenger. These conversion was done on the request of shipowner himself but without any consideration for passenger safety or comfort accommodation from administration and/or shipbuilders.

Originally, passenger ship are designed to accommodate specific number of passengers. However unnecessary looking spacious boat deck, promenade deck, passenger section, and width of corridor and stairway are, these area are necessary just in the case of accident for crew to reach the point immediately to cope with the problem, for passengers to leave from the point for safety, for passengers to gather before leaving ship or so on. Consequently, it upsets the original design with careful consideration of passenger safety to facilitate double bunks and cots without regard to specific plan. SHIPDECO report as quoted below describe the situation in concrete.

"Most Philippine passenger ships are unsafe because of the tight stowage of passengers. Elderly persons, handicapped people or children will have little chance, if any, to escape safely if an accident should happen. Even strong people will be in trouble. All the baggage carried by the passengers makes this even worse. Corridors and stairways are narrow and not designed for the volume of passengers baggage permitted on board. Perfect, functioning life saving equipment can only help this problem marginally."

In addition, some ships loose stability in large degree due to conversion. (see Annex 2.7) The appropriate solution on this issue is to disallow any conversion of second-hand passenger ships. Other solution is unthinkable.

b) Low quality due to shortage of steels, instruments and spare parts.

Almost all materials for maintenance and repair of ships are import materials. Long supply period and high rate of import tax induce provisional repairs. As mentioned before, such poor repair cause "engine trouble and drift".

To improve this situation, import tax incentives and simplified import procedure are necessary. Moreover, subsidiary support to the shipbuilding related industries are desirable.

c) Decreasing steel (hull) ship construction.

Sharp decrease of new shipbuilding demand at present gives a death blow to shipbuilding industry. Evident reason are the cheap, second hand ships that are readily available as compared to new building that cost much due to material, component importation duties and taxes amounting to 35% of purchase value.

There are four (4) ways for shipowner to acquire a ship, these are;

(a) Ship building in Philippine
(b) Ship building in some foreign country
(c) Import second-hand ship or
(d) Bare-boat charter

At present, bare-boat charter is the most economic, and local shipbuilding is the most expensive way. Economic rationality directs bare-boat chartering policy but unfavorable to local shipbuilding.

In order to change this situation, consolidated financial support to maritime industry is required from related government bodies. But even with adequate financial support, it is not sufficient to uplift the industry. Local ship building technology are behind in any field of price, period, quality and even on appearance. Upgrading the technology in manpower field and facilities are urgent task.

d) Structure problem of wooden hull vessel.

Wooden hull vessel is constructed without plan. Vessel are built based on constructors experience only. This practice of shipbuilding shuts the gate of ensuring safety of the vessel from modern shipbuilding technology point of view.

The precarious situation is that many vessel don't have watertight bulkhead.(see Annex 2.8) In some cases, vessels with bulkhead are unable to maintain its watertightness. The vessel without watertight bulkhead "capsized or sunk" without exception once the hull cracked. It is urgent for the government to encourage/force builders of all wooden hull vessels to install an engine room bulkhead and/or collision bulkheads in a watertight condition .

e) Motor Banca

Watertight bulkhead problem in motor banca are evident. Fore part and engine room shall be protected with bulkheads. Outright quantitative analysis is not possible due to unavailability of design plan, thickness of shell plate and clearance of freeboard seems too small. Additional thickness of shell plate and freeboard clearance are required even in short travel distance in order to keep the ship safe.

2.2.2 Inspection of Ships

a) Inspection improvement

Maritime accident tends to increase. Around fifty percent of accidents are considered a result of ship fault itself, which include cases of passenger ferry/passenger cargo with "License of Stability" to capsized/sunk. Authorities in charge of ship inspection have to look into their past administration of ship inspection program and improve quality of inspection referring with comments describe above.

b) Amendment of PMMRR

The ongoing amendment of Philippine Merchant Marine Rules and Regulation (PMMRR) does conform with the SOLAS 1974. Completion of amendment itself, however, does not always mean increase safety in passenger ferry/passenger cargo and decrease of maritime accidents.

PMMRR shall include the following articles;

(a) on passenger transport; to provide adequate compartments, spaces and accommodation and not to load beyond loading capacity as is

(b) on wooden hull vessel: to establish rules for structural design that will facilitate water-tight bulkhead installment

(c) on Fiberglas Reinforced Plastic (FRP) hull boats to establish rules for structural design.

c) Transfer of Ship Inspection System

Executive Order 125/125-A state that ship inspection shall be unified under MARINA. However, PCG continues to execute inspection works. PCG shall transfer the inspection works and administration to MARINA. Transfer shall be accompanied with budget and engineers.

d) Validity of Ship Classification

The existence of the Internationally recognized ship Classification Societies will reduce government work has inter-island vessel are classed by these Classification Societies and treated as substitute of government approval. Such government work does not mean that government classification/inspection are of no use or value but classification by ship Classification Societies are bound to replace/negate government task. As clarified by SHIPDECO report and quoted below .

"It is stressed that the concept of Class is not covering all aspect of the vessel's safety and seaworthiness. The Class is only concerned with the structural strength of the vessel, and the reliability of the equipment necessary for safe operation of the vessel. All other items normally related to as safety measures are not a part of the classification concept."
Even some part of inspection can be endorsed to the

Societies, but responsibility to secure maritime safety still remained in the government.

e) Upgrading of shipbuilding engineers

There is present shortage of shipbuilding engineers in the industry. In addition, a handful are needed to undertake ship inspection work.

To reverse the situation , it is very important to activate and upgrade existing courses and education facilities located in Namei Polytechnic Institute, Mariner Polytechnic College, Cebu Central College and MATS College of Technology .

2.3 Improvement Plan

2.3.1 Short Term Plan (1992-1995)

a) Execution of Ship Inspection (201)

Effectiveness of any rules and regulations depends on the quality and system of inspection implementation. Inspection pertaining to vessels of interisland trade should reflect particular Philippine conditions were specific requirements on the extent of required survey given that would provide and insure the safety of lives and properties at sea as well as the environment in which the vessel will operate.

(1) Steel hull passenger ferry/passenger cargo;

- Level classification of repairs/inspection

Taking into particular consideration the age and physical condition of the ships, it is worth to classify the level of repairs/examination on periodical inspections primarily during dry-docking. The classification will determine the extent of the required repairs which are to be carried out. Survey/inspections includes examination of hull, position of loadline, special load lines, propulsion and auxiliary machinery, boilers, electrical installation, fire protection equipment and life saving apparatus. Inspection can be categorized according to age, gross registered tonnage and physical condition of ships in order to come up with a comprehensive and determinative inspection system.

- Determine ship stability

  Some ships loose its stability due to conversion/alteration. It is necessary to redetermine and check the present ship stability for appropriate action and recommendation. The use of plain method to discriminate ship stability by T. Hishida and N. Tanaka is recommended . (see Annex 2.9)

- Recommend large scale ship improvement or replacement of substandard and/or poor-maintained ship

  To check vessels conditions, it is proper to notify owners for any damage/defects sustained by the vessel specially by grounding or collision which affect or may affect ship machinery or structure. Submit modification or adjustment to remedy such defects. Recommend replacement if vessel are found not in proper condition and/or poor-maintained.

- Examine and study the present approved passenger capacity number

  The tight stowage of passengers, narrow corridors and stairways and the volume of passenger baggage don't conform with the vessels basic design concept. To alleviate the situation it is necessary to examine/study the present approved passenger capacity number and introduce revision if necessary.

(2) Wooden hull Passenger ferry/Passenger Cargo

  Present wooden hull vessel lack the necessary technical component of a seaworthy vessel. It is technically imperative to hasten the development and implementation of a standard wooden hull construction system.

- Facilitate watertight bulkhead installment.

- Determine ship stability and to recommend large scale ship improvement (ex. install of fixed ballast) or replacement of substandard and/or poor-maintained vessel.

- Embark on a study in order to establish rules and regulation for structural design.

(3) Motor Banca

- Facilitate watertight bulkhead installment

- Embark on a study on freeboard technical standard

- Embark on a study on rules and regulation for structural design.

b) New Organization of Ship Inspection (202)

With the intended transfer of ship inspection administration to MARINA as prescribe in E.O. 125/ 125-A, it is important to establish a new ship inspection organization scheme . The new organization will enhance the capability of the government to achieve the necessary professionalism and expertise in enforcing ship inspection.

Ship Inspection Organization Set-up :

(1) Head Office

- Location ; Manila

- Works :

* Approval of Plan of new/conversion ship
* Issue of License/Certificate
* Registration of Ships
* Amendment of Rules/Regulations
* Technical control on Shipbuilding/repairing industry
* Correspondence to international convention
* Preparation and maintenance of inspection manuals

- Personnel:

* Lawyer, 2 - 3 persons

* Naval architect and Marine Engineer, 8-12 persons

* Mechanical Engineer, 4-8 persons

* Industrial Engineer, 2-6 persons

* Electrical Engineer, 2-6 persons

* Enlisted personnel , 6-10 persons

(2) Regional Office

- Location : Batangas, Legaspi, Cebu, Iloilo, Tacloban, Cagayan de Oro ,Davao, Zamboanga, Cotabato

- Works:

* Conduct construction survey to ensure compliance of approved ship's plans

* Conduct dry-docking survey (dry-docking survey is done once a year for passenger vessel and biennial for cargo vessel)

* Supervise the conduct of inclining experiment to ensure compliance of stability criteria

* Conduct tonnage measurement of vessel

* Verification of loadline mark

* Mandatory inspection of the vessels as a requirement in the issuance of " Certificate of Inspection" such as the condition of hull, machinery, equipment, etc.. manning requirements and ships documentation

* Conduct unscheduled Material Readiness Inspection (MRI) of ships to ensure maintenance of seaworthiness at all times.

- Personnel:

* Naval architect and marine engineer, 4-8 persons
* Mechanical engineer and electrical engineer, 2-6 persons
* Enlisted personnel, 4-8 persons

c) Importation Assistance (203)

Lifting/preferential treatment in the payment of taxes on imported components to the ship building industry or restoration of incentive similar to P.D. 666 would definitely re-vitalized the shipbuilding activity. The incentive will help alleviate the plight of the industry despite already existing problems. Such favorable atmosphere will create employment opportunities on the shipyard as well establish ancillary and supporting industries. The government will generate income due to business taxes and personal income taxes. Present activity would be concentrated to conversion but eventually shift to new shipbuilding.

(1) Tax assistance;

- Undertake importation tax study on items that cover shipbuilding, repair materials, fittings and equipment

(2) Importation procedure simplification

(3) Navigational instrument requirements importation assistance for vessel 250 GRT and above to augment the need for new and essential instruments. Examples

of instruments are as follows :

- Radar
- Echo depth sounder
- Speed log
- Global Positioning System (GPS) receiver

d) Financial assistance (204)

Attractive financing schemes to ship owners with reasonable interest rates could be drawn-up existing financial institution. Such assistance would attract ship owners to purchase and modernize their shipping fleet thru our local shipyards. In addition to the financing scheme an appropriate incentives make the shipbuilding industry viable and competitive to bare boat charter system.

(1) Long range, low interest rate government financial support to new ship building (to owner but not to shipbuilder) and/or

(2) Interest/operational subsidy to new ship building owner.

e) Amendment of PMMRR and setting of additional regulations (205)

(1) Amendment of PMMRR to conform with SOLAS 1974

(2) Add the article "Passenger Ship Requirement" to define the required facilities and number of passengers permitted on board categorically clear.

(3) Establish structural design regulations for wooden hull vessel (including Banca) and FRP vessel.

f) Domestic production policy (206)

(1) Review the possibility of domestic steel production for ships with the cooperation of the local iron/steel industry. There is a greater prospect for production to prosper.

(2) Review the possibility of domestic production of ship materials using large casting technology (for production of stem, stern frame, shaft bracket , propeller and etc..)

g) Scrap and build policy (207)

It is one of the most important policy measure in the long run to strengthen local shipbuilding industry. However, local shipbuilding demand stagnates as mentioned above. In order to activate, at least, major shipyards introduction of scrapping works is recommended.

Estimated scrapping demand of ships in the world is 10 million GRT per annum in average during 1995 and 2005. In contrast to coming high demand major scrappers, mainly Korean companies and Taiwanese companies, are decreasing their scale of business due to increasing labor cost is going not to cover comparatively lower price of scrapped steel. However, scrapping business might be feasible in the Philippine in favor of relatively low labor cost and plenty labor source.

Introduction of scrapping business into the country is not only for stimulating shipyard works but also to earn foreign currency. Moreover, additional by-products are (1) production possibility of high quality steel for shipbuilding use becomes high, (2) re-use of main engine, auxiliary engine and/or propulsion apparatus of a ship to be scrapped is considerable when they are still in good condition, (3) scrapping of local ships stimulates new shipbuilding demand and local shipbuilders could compete with foreign rivals for receiving orders if competent and (4) there are some possibility to receive considerable amount of promotion fund from some association of shipscrapping promotion because shipscrapping problem is becoming one of major issues for shipbuilding industry in the world.

h) Comment on execution and expected result

It is advisable for the Philippine government to request foreign experts with the cooperation of local experts to act as coordinator in order to accomplish these policy effectively.

Execution of this plan results in;

- acceleration of scrap and build of ship,
- lessen maritime accidents,
- improve safety level of vessels
- improve ship building/repairing technology,
- lessen unit cost of ship building/repairing,
- promote import substitution and
- create employment opportunities.

Meanwhile, MARINA has a Design Goal of Maritime Industry Sectorial Development (shipbuilding /

shiprepair sector) Five Year Plan (CY 1992-1996) with several objectives, goals and targets. These are;

Objectives :	Goals/Targets:
* Promote local shipbuilding and shiprepair by encouraging acquisition of locally built ships	* Implementation of a rationalized incentive program for SBSR
	* Assessment/studies of financing schemes and program for the SBSR Industry
* Develop local shipbreaking capability and encourage the scrapping of sub-standard vessels	* Implementation of a rationalized incentive program for the shipbreaking Industry
* Rationalize SBSR operation and improve competitiveness of local construction	* Reduced import dependence on vessel acquisition
	* Improvement of local shipbuilding/shiprepair and vessel design capability
* Strengthen the institutional capabilities in regulating the SBSR industry	* To reduce local dependence on foreign classification society
* Promote research and development activities and specialization in SBSR	* Enhancing the technical capability in shipbuilding/ship repair and shipbreaking

The proposed improvement plan is a definite program to achieve the goals/target shown above.

2.3.2 Long Term Plan (1996-2010)

a) Strengthen ship building industry

Incentives to the shipowner perform well with a revolutionize/competent shipbuilding industry. In case there is no such qualified shipbuilding industry, proceeds of the incentives will benefit the shipbuilding industries of other country. In order for the Philippine shipbuilding and ship repair industry be on a competitive with foreign countries, it is

essential that the government continue its assistance to the industry and the following sets of plans should be introduced.

(1) Introduction of soft loan for the industry modernization (208)

It is essential to provide long term low rate loan in order to modernize construction facilities. The investment function is to reduce the construction process to decrease ship unit price.

(2) Standardized ship construction

Standardization of ship construction by type and size is necessary to enhance and maintain ship building technology and to decrease the unit construction cost of vessels. Standardization of ship design includes production of standardize local ship components i.e. equipments and outfitting for economical repair and maintenance.

If possible it is also recommended for the transfer of SAR vessel design and construction from the shipyard abroad to local qualified shipyards.

(3) Maritime industry cooperation system (209)

Cooperation system between shipyards in the field of procurement, logistic and design posses the necessary competence for carrying out new ship building project. Each element of ship industry has a vital role in providing the necessary technological expertise and facilities. Using those capabilities in the various ship construction stages, optimize the utilization of the facilities and the manpower skills of participating shipyard. The system will transform the shipbuilding industry into an efficient and effective industry. The process will enhance to the shipbuilding technology, manpower skill and gain competence in the art of competitive shipbuilding.

(4) Shipbuilding technology center (210)

Instruments/apparatus boarded on vessel require high reliability on operation due to the tough nature of use. To secure high reliability it is generally ruled that instruments/apparatus on board without authorization of "type approval" attested by national governmental authority in charge are prohibited in use. However, there is no authority in the Philippine which gives type approval.

This center shall be utilized not only for "type approval" but also for training of ship inspection officers and for grading up of ship building engineers.

Research facilities for ship dynamics, propulsion, structure, engine and equipments shall be installed in future. In this line the center is expected to become the heart of shipbuilding technology.

b) Education of shipbuilding engineers (211)

To cope up with the shortage of qualified ship building engineers, it a necessity to reinforcement of the said courses in the three education institution namely Namei Polytechnic Institute, Mariner Polytechnic College and Cebu Central College.

c) Domestic production of related industries (212)

Study the possibility of establishing an active auxiliary industries to produce/manufacture the necessary ship components such as marine engines, electric motors, electric instruments and etc.. Such industry is a major support for the material/ spare part supply of the local ship builders and repairers .

The introduction of the proposed improvement plans would result in ;

- Improvement of international trade balance
- Increase of employment
- Development of advanced technology and
- Contribution to the government finance.

2.4 Cost Estimates

Cost are estimated in 1991 fixed price. Changing rate of US dollars to Pesos is 27:1 and of Japanese yens to Pesos is 5:1.

2.4.1 New Ship Inspection System (202)

a) New Organization

The new organization for ship inspection is established in MARINA and existing organization of PCG is to be abolished. The new organization is headed by the Principal Ship Inspector, ranked with Vice Administrator of MARINA.

Main and nine(9) local offices locate Manila (main

office), Batangas, Legaspi, Cebu, Iloilo, Tacloban, Cagayan de Oro, Davao, Zamboanga and Cotabato. The main office locates in MARINA head office and is directed by the principal ship inspector. A local office locates in each MARINA regional office and is conducted by a senior ship inspector who is under control of a regional director but also supervised by the principal ship inspector.

Details of organization and number of staff (in parenthesis) are as follows;

Organization of the Main Office

Principal Ship Inspector (1)

Rules and Regulation Section (2)

Ship Hull Inspection Section
- Performance Inspector (3)
- Structure Inspector (3)
- Fittings and Equipments Inspector (3)

Ship Engine Inspection Section
- High Speed Engine Inspector (3)
- Low Speed Engine Inspector (3)

Ship Apparatus Inspection Section
- Electric Devices Inspector (2)
- Navigation Instruments Inspector (2)

Registration and Tonnage Measurement Office
- Officer (2)

Administration Office
- Officer (8)

Organization of a Model Local Office (Small difference of number of staff by size of the office is anticipated)

Senior Ship Inspector (1)

Ship Hull Inspection Section	(3)
Ship Engine Inspection Section	(2)
Ship Apparatus Inspection Section	(2)
Tonnage Measurement Office	(2)
Administration Office	(4)

Total number of officials is 158, of which 32 is assigned to a main office and 14 in average is to each local office.

Ship inspection is executed at the location of shipbuilders / ship repairers. In general two times of

inspection services per month by 2-3 inspectors is considered.

Cost to maintain this organization is assumed to be 12 million pesos annually including ship inspection travel expenses.

b) Training

(1) Training in the Philippine

Four (4) foreign experts shall be invited in range of stay in four (4) years to train local ship inspectors at work and also inspector candidates. Breakdown of four (4) experts are as follows;

(1) Shipbuilding Administration
(2) Ship Hull Inspection
(3) Ship Engine Inspection
(4) Ship Instrument Inspection (electric devices and navigation instruments)

Grant aids for dispatching foreign experts are expected.

(2) Training in the abroad

In the Philippine there is scarce opportunity that ship inspectors have practical experience in new shipbuilding works of various types. In order to give them such experience, training in advanced shipbuilding country is important. Grant aids are also expected to compensate for traveling / training expenses.

2.4.2 To accelerate Scrap and Build Policy (207)

Plan to promote scrapping industry is as follows;

(a) To lend facilities/machines/transports for scrapping works to an appropriate shipyard which has intention to start scrapping business and is facilitated with a graving dockyard in large scale and/or long berth open to wide sea area in front.

(b) Facilities/machines/transports to be lent are steel cutting machine, crane (on land), crane (on barge), tag boat and barges for scrap transport.

(c) They cost 7.3 million dollars a set.

2.4.3 Establishment of Shipbuilding Technology Center (210)