BASIC DESIGN STUDY REPORT
ON
THE IMPROVEMENT PROJECT
FOR
UJUNG PANDANG RATING SCHOOL
IN
THE REPUBLIC OF INDONESIA

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PREFACE

In response to the request of the Government of the Republic of Indonesia the Government of Japan decided to conduct a basic design study on the Improvement of Project for Ujung Pandang Rating School and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Indonesia a study team headed by Mr. Nobuaki KOJIMA, Senior Maritime Researcher, the Maritime International Cooperation Centre from October 29 to November 18, 1986.

The team had discussions on the Project with the officials concerned of the Government of Indonesia and conducted a field survey in Barombong area. After the team returned to Japan, further studies were made and the present report has been prepared.

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

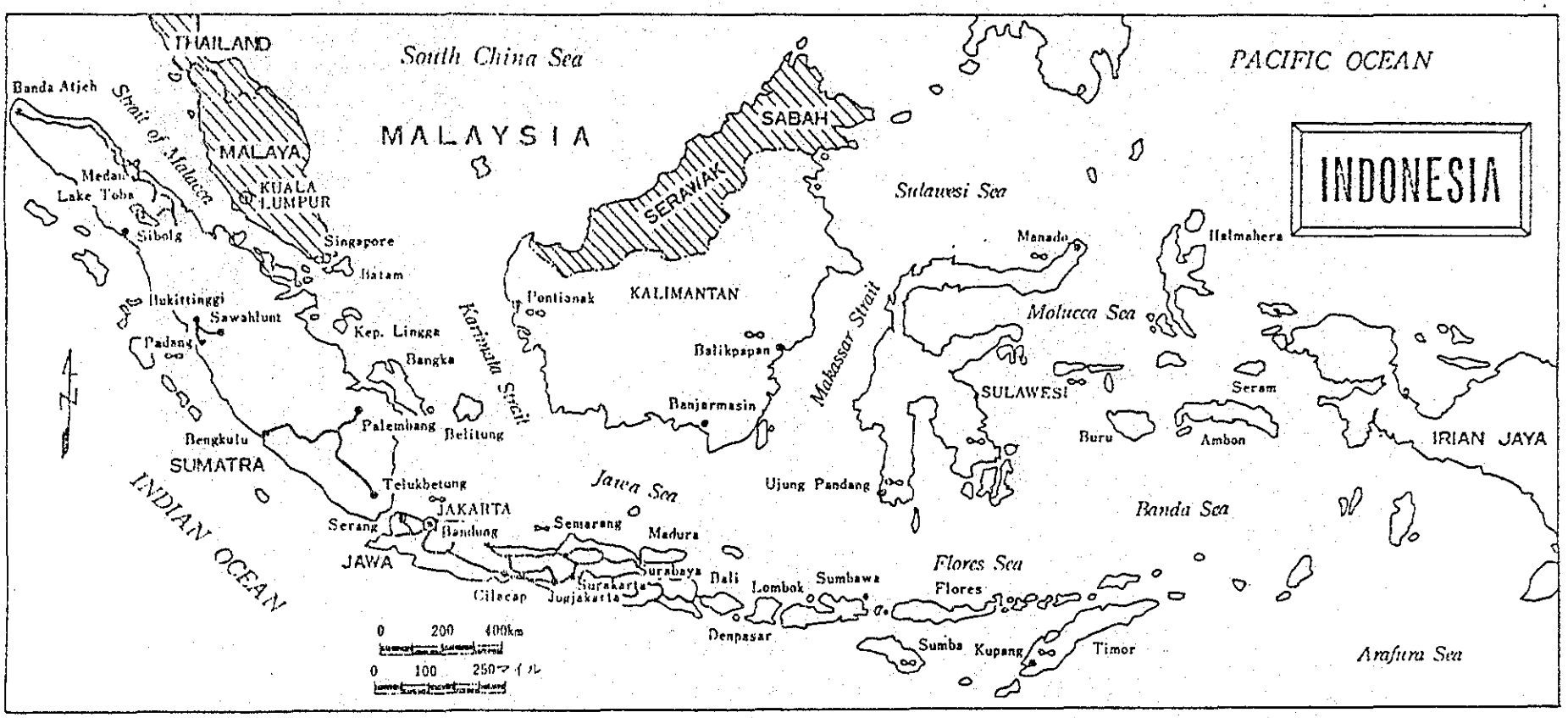
I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the team.

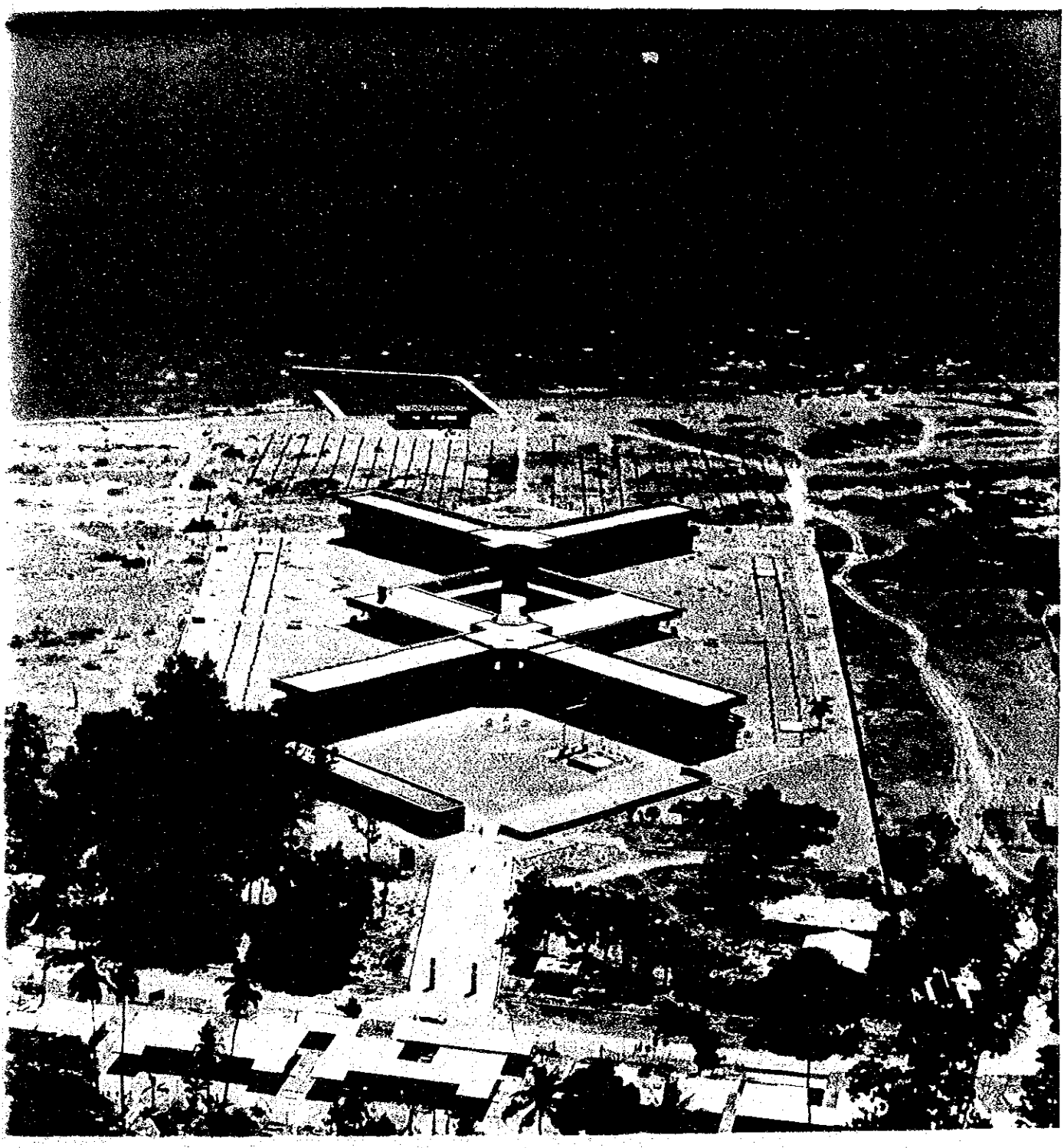
March, 1987

Keisuke Arita

Keisuke Arita
President
Japan International Cooperation Agency

Map of Indonesia





Ujung Pandang Rating School on Its Completion in 1980

SUMMARY

SUMMARY

As the Republic of Indonesia consists of some 13,000 islands, sea communications are of crucial importance for the country. There are, however, many problems to be solved for the satisfactory operation of sea communications, including the lack of adequate tonnage, the large proportion of old ships, the shortage of port facilities and the low productivity.

The Directorate of Sea Communications and the Education and Training Agency exist under the jurisdiction of the Ministry of Communications in regard to the training of seamen for sea communications purposes. The Education and Training Centre (Maritime), a sub-organization of the Agency, is responsible for all domestic seamen training. The Third 5 year Economic Development Plan (1978 - 1983) steadily expanded seamen training by strengthening the merchant fleet, expanding transport capacity and improving ports, sea routes and navigation aid facilities. The Fourth 5 Year Economic Development Plan (1984 - 1989) also envisages the further improvement and consolidation of all the related sectors.

This maritime training plan is based on the Maritime Sector Development Programme and the Integrated Sea Communications Manpower Development and Training Master Plan, etc.

The Ujung Pandang Rating School, the subject of the present project, is located in the Barombong area, some 9km south of Ujung Pandang City, the capital of the south Sulawesi Province in the south end of Sulawesi Island, facing Macassar Strait. The School was completed in March, 1980 with the Japanese grant aid cooperation and was opened as a national rating school in June, 1980, achieving positive results up to the present. The School has a floor area of approximately 7,000m^2 for various facilities, including the main building, dormitories, practical training rooms, canteen, library, clinic, fire drill training building and the boat house, on a campus area as large as 627,000m^2. The structure of the School comprises the Education Department and the Adminis-

tration Department under the principal. While the former is responsible for the education-related fields based on the education and training curricula, the latter is responsible for the operation and the management of the School.

From its opening in 1980 to September, 1983, the Ujung Pandang Rating School conducted the re-education of seamen in active service. Commencing in January, 1984, however, it has been providing navigation, engineer courses with a capacity of 25 students each for new secondary school graduates. Two experts (for navigation and engineering) have been dispatched from the Japan International Cooperation Agency for the management and education of the School.

After three years education the successful candidate of the National Seamen Competency Examination is qualified as either coastal navigation officer or coastal engineer, and can work as the officer of coastal liner or the crew (not officer) of ocean liner. As of November, 1986 the students of the School are about 130.

The request of the Project originates in the background which the Government of Indonesia decided to modernize and consolidate the facilities and equipment of the School for seamen education, with the effectuation of the STCW Convention (International Convention for Standards on Training, Certification and Watchkeeping) in 1984 in order to improve the quality of seamen internationally and prevent maritime accident. Due to the laps of six years after the opening of the School, some of the equipment have already deterioritated and need to be renewed. With the intention of consolidating the basis for seamen training, by renewal and improvement of the the related facilities and equipment as well as expansion of the educational contents, the Indonesian Government requested to the Japanese Government for providing grant aid to carry out the said plan.

In response to this request, the Japanese Government decided to conduct a basic design study for the Project and the Japan International Cooperation Agency accordingly sent the Basic Design Study Team to

Indonesia for a period of 21 days from October 29 to November 18, 1986 to investigate the appropriateness of the Project, to decide its optimum size and to prepare the Basic Design of the facilities/equipment to be provided under this project.

The Basic Design was carried out based on the suggestions made by the Preliminary Study for the Project conducted in May, 1986. The subjects of investigation are as follows.

(1) Study on the equipment for the implementation of new training subjects (for operation of the equipment, fire drill and floating survival necessary for duty crew on bridge and engine room).

(2) Study on the construction of a small practical training bulding for boiler and automation equipment.

(3) Study on the introduction of a new cutter launching system as a substitute for groyne for cutter training due to the fact that the ongoing accumulation of drifting sand may fill the groyne as far as the outer edge in the future.

The contents of the request by the Government of Indonesia were investigated and studied in accordance with the above points of view. The final results of the discussion are as shown in the "Minuts of Discussions" in the appendix attached at the end of this report.

The major items agreed to are as follows.

I	Various types of navigation training equipment
II	Various types of survival training equipment
III	Various types of fire drill equipment
IV	Various types of deck department equipment
V	Various types of engine department equipment
VI	Practical Training Building (approx. 355m^2, single-story)
VII	Various types of audio-visual teaching equipment
VIII	4 school buses
IX	Jetty (approx. 30m in length for cutters)
X	Others

The project cost to be borne by the Indonesian Government is estimated to be approximately 110 million Rp (11 million yen).

The total construction period is expected to be 12.5 months after the conclusion of the official Exchange of Notes between the both governments, including 2 months for detailed design, 1.5 months for tender, 4.5 months for equipment manufacture, 1 month for transportation, 2.5 months for installation, 5.5 months for construction work and 5 months for civil engineering work, with some overlap periods.

It is believed that the successful implementation of the Project will contribute not only to the sea communications but also to the social and economic activities in Indonesia because capable personnels will be provided to the sea communications sector in Indonesia by the modernization and improvement of Ujung Pandang Rating School. It is, therefore, concluded that the Project is worthy of qualifying as a proejct for grant aid by the Japanese Government.

CONTENTS

CHAPTER 1

INTRODUCTION

CHAPTER 1. INTRODUCTION

Since the first study team on the Rating School Programme was sent to the Republic of Indonesia, the Japanese Government has been assisting in 1975, the education and training of seamen in various Southeast Asian countries through grant aid and technical cooperation. The present Project for the Improvement of Ujung Pandang Rating School is rated as one of the largest projects in this field.

Since its opening in 1980, the Ujung Pandang Rating School has been properly operated and maintained in close cooperation between the Indonesian and Japanese Governments and has achieved excellent results as a pilot educational institution for the training of Indonesian seamen.

With the growing concern in recent years for the prevention of disasters at sea and the protection of the maritime environment, strong moves to set up an international standard for the quality of seamen have been seen. As a result, the International Convention on Standards of Training Certification and Watch-keeping for Seafarers (STCW Convention) was adopted in 1978 and enforced in 1984. (STCW Convention is an international treaty stipulating standards for seamen training, certification and watch-keeping.)

With the enforcement of this STCW Convention, the Indonesian Government made the decision to both improve and expand the educational facilities at the Ujung Pandang Rating School, originally a training institution for seamen, in order for Indonesian seamen to be able to meet this newly-introduced international standard and presented the Japanese Government with a request for grant aid for the present Project.

In response to this request, the Japanese Government decided to conduct a basic design study. Accordingly, the Japan International Cooperation Agency (JICA) sent a study team to Indonesia headed by Capt. Nobuaki Kojima, a senior maritime researcher of the Maritime International Cooperation Centre, for a period of 21 days, from October 29 to November 18, 1986. The study team conducted a field study to determine the

appropriateness of the Project, set the Project's optimum size and prepared the basic design.

On its return to Japan, the study team had a series of discussions with related people to further elaborate on the considerations of the Project's appropriateness, its optimum size, the preferred grade of training equipment and facilities, the management system and the effects of the grant aid. Based on these discussions, the necessary equipment and materials were selected and the basic design was completed.

The optimum basic design for the implementation of the Project is presented in this report based on the results of the field study, consultations with Indonesian officials and data and materials collected in Indonesia.

The composition of the study team, the study schedule, the list of people interviewed and the minutes of the discussions are given in the Appendices of the report.

CHAPTER 2

BACKGROUND OF THE PROJECT

CHAPTER 2. BACKGROUND OF THE PROJECT

The Republic of Indonesia is made up of some 13,000 islands and, therefore, coastal and ocean communications play a significant role as transportation methods.

In view of the significance of sea communications, the Indonesian Government prepared a 5 Year Sea Communications Improvement Plan in 1975 for the reinforcement of its fleets. In addition, the consolidation of the education and training of seamen has been one of the most important aspects of the national manpower development in Indonesia.

In 1974, President of Indonesia requested Japanese cooperation for the foundation of a rating school on the occasion of Japanese Prime Minister's visit to Indonesia. In response to the request, the Study Team on the Rating School Project for the Republic of Indonesia was sent in May, 1975 and a study report was subsequently prepared and presented.

Based on this report, the project to build a rating school for the training of seamen at Ujung Pandang was prepared by the Indonesian Government in 1977 and a request to provide grant for the Project was presented to the Japanese Government.

On receipt of the request, the Japanese Government sent the Ujung Pandang Rating School Basic Design Study Team to Indonesia in October, 1977 and the team's report was duly presented. The Project commenced in 1979 and the construction of the school was completed and handed over to Indonesia in 1980.

Since its opening in 1980, 2 Japanese experts, i.e. a navigation expert and a machinery expert, have been sent to the Ujung Pandang Rating School and have provided advice and guidance on the preparation of carricula, educational and training methods and the maintenance and management of the provided equipment. These experts greatly contributed to the smooth implementation of the educational activities and to the improvement of the educational effects by helping the management of the school to get under way through this advice and cooperation.

2-1 Seamen Education and Training Programme in Indonesia

2-1-1 Seamen Training System

The seamen training system in Indonesia comes under the jurisdiction of the Department of Communications. There are 7 Directorates within the Department of Communications, including the Directorate General of Sea Communications which is responsible for maritime administration. The Education and Training Agency, one of the 7 Directorates, is directly answerable to the Secretariate General and controls the training of seamen in those fields under the jurisdiction of the Department of Communications. There are 3 Education and Training Centres affixed to the Agency which are responsible for the training of administrators and technicians for sea, land and air communications. All seamen training organizations, regardless of their being public or private, are controlled by the Centre for Sea Communications.

The Directorate General of Sea Communications has authority over those systems relating to the Seaman's Certificate and the Seaman's Competance Examination of general seamen training and also over the administrative work which is indispensable for the good linkage between the educational institutions and the central administration. In addition, as the main office for maritime administration, the Directorate General also plays the role of an industrial and technological information centre for sea communications, ships and seamen, etc.

In the past, foreign aid programmes in regard to the education of seamen were all conducted through the Directorate General.

The Centre for Sea Communications, a subordinate organization of the Agnecy, deals with the following:

(1) Preparation of seamen training programmes.
(2) Preparation of the essential requirements for the implementation of seamen training programmes (i.e. curriculum, instruction manuals and improvements of facilities, equipment and

materials, etc.)

(3) Control and supervision of the educational and/or training institutions.

(4) Evaluation and coordination of the progress of the programmes.

Fig. 1 shows the seamen training structure in Indonesia.

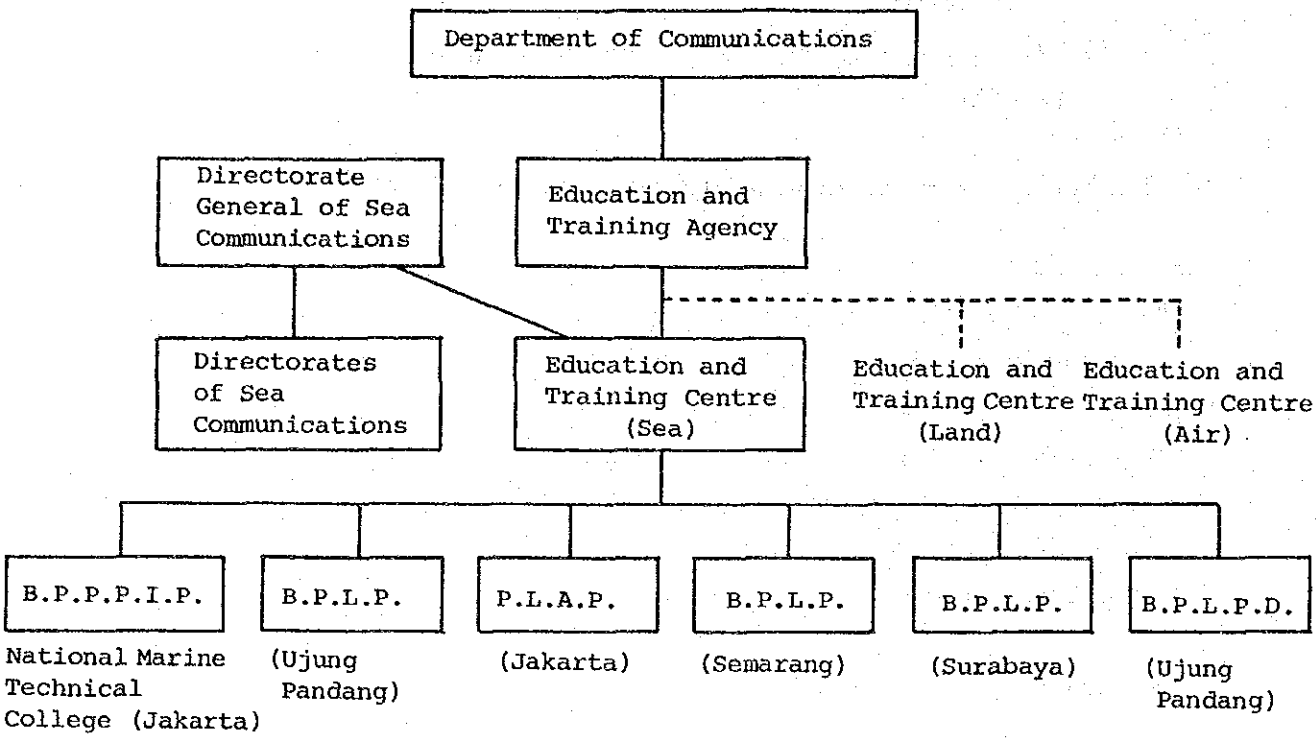


Fig. 1 Administrative Structure for Seamen Training

Note: B.P.L.P. : Balae Pendidikan Dan Lathan Perayaran
Seamen's Education and Training School
(Maritime Academy)

B.P.L.P.D. : Balae Pendidikan Dan Lathan Perayaran Dasar
Ujung Pandang Rating School

2-1-2 Seamen Training Institutions

As shown in Fig. 1, there are a number of seamen training institutions located in each region of Indonesia.

(1) National Marine Technical College (B.P.P.P.I.P.)
This college provides opportunities for the further education of those wishing to gain the Primary, Middle or Higher Seaman's Certificate after a respective period of work as seamen. Its status is equivalent to the Marine Technical College in Japan.

The college was originally opened on the site of the Jakarta Maritime Marine Academy but moved to Kel Melawai, 8 km south of Jakarta, in 1971. Education and training curriculums are prepared for each of the above 3 certificates. Applicants must have the necessary experience to be eligible for the certificate examinations and qualifications of one rank lower.

(2) Jakarta Maritime Academy (P.L.A.P.)
Founded in 1953, the Jakarta Maritime Academy is the oldest and the most representative maritime institution in Indonesia. It offers a 3 year course for senior high school graduates for the First Certificate for Ocean-Going Seamen and a 1 year course for those with 2 years actual experience following graduation of the previous course to prepare first mates and first engineers for ocean-going liners.

The education and training of the 3 year course consists of classroom study for 4 semesters (1 semester is 6 months) and on-board training for 2 semesters.

Captain or chief engineer training is provided by the B.P.P.P.I.P.

(3) Other Maritime Academies

Other national maritime academies are located at the important Indonesian trading ports of Semarang, Surabaya and Ujung Pandang and were founded in 1974, 1982 and 1983 respectively.

① Semarang Academy

This Academy was opened in 1974 and is, therefore, the second oldest maritime institution after the Jakarta Maritime Academy. It is located on a site of 61,000m^2 and is equipped with practical training facilities, laboratories, a library, etc. Renewal of the educational equipment is, however, deemed necessary.

② Surabaya Academy

This is a relatively new academy, opened in 1982 as a branch of the Semarang Academy. Its site is as small as 10,000 m^2 and there is no room for extension. The Academy requests the engine manufacturers and shipping companies in Surabaya to allow their facilities to be used for the practical training of the students in order to supplement the shortage of practical training facilities and laboratories at the Academy.

③ Ujung Pandang Academy

The Academy was first opened as a seamen training school for coastal shipping. In 1983, it was upgraded to a maritime academy to train seamen for ocean shipping. It has a site of 2.6 ha and both the practical training facilities and equipment are inadequate.

(4) Ujung Pandang Rating School

This school is the subject of the present Project and is located some 9 km south of Ujung Pandang, Sulawesi (some 27 km by road). All of the School's educational facilities and equipment, including the school buildings, were provided by Japanese grant aid. It was opened in 1980 as the first national rating school in Indonesia. (Note: an outline of

the School is given in 2-2 Outline of Ujung Pandang Rating School.)

(5) Surabaya Pilot Training School

Founded in 1971, this is the only pilot training school in Indonesia. It is located in Surabaya's Tangung Penak District. The School has one 2-story building with 5 classrooms (each capable of seating 25 students) and dormitories. Its provision of laboratories, training rooms, library and educational equipment is, however, poor. Although the eligible applicants should be senior high school graduates with the Grade 1 Certificate for Coastal Shipping, most of the trainees have the Grade 3 Certificate for Ocean Shipping.

The first 6 months of the year's training period are allocated for classroom study and the second 6 months are used for practical pilot training.

(6) Other Private Maritime Institutions

As well as the 4 national maritime academies, there are a total of some 20 private maritime institutions in Indonesia.

There are 2 such institutions, i.e. Akademi Maritime Indonesia and Akademi Djadajat, in Jakarta. Generally speaking, these private academies have no particular facilities and equipment worth noting apart from the classroom study. In addition, they are not given the convenience of practical training on board merchant vessels. Their pass rate of the national examination for the Seaman's Certificate is, therefore, generally low.

2-1-3 Seamen Training Expansion Programmes

(1) Fourth 5 Year Economic Development Plan

The current basis for Indonesia's national economic policy is the Fourth 5 Year Economic Development Plan (1984 - 1989). The Third 5 Year Economic Development Plan, completed in 1983, brought forth steady progress in such aspects of the sea communications sector as the strengthening of the merchantile marine, the expansion of the sea transportation volume and the improvement of port, fairway and navigation aid facilities. Moreover, the Fourth 5 Year Plan has the following targets in order to promote the development of industries and local areas through the further expansion of coastal and ocean shipping and related fields.

Tonnage Improvement Targets of Fourth 5 Year Plan
(Newly Built and Replacement Ships During Plan Period)

① Coastal Shipping

* Domestic Regular Liner	420,300 DWT
* Local Shipping	98,000 DWT
* People's Shipping	85,000 DWT
* Pioneer Shipping	4,600 DWT

② Ocean Shipping

* General Purpose Shipping	490,500 DWT
* Special Purpose Shipping	482,000 DWT
* Tankers	659,800 DWT

Dredging and Port Facility Improvement Targets of Fourth 5 Year Plan

① Port Facilities

* Quays	18,815 m
* Warehouses	356,100 m^2
* Open Air Storage	270,000 m^2
* Container Yards	170,000 m^2

② Dredging

* Maintenance Dredging	140,000,000 m^3
* Foundation Dredging	23,000,000 m^3

Navigation Improvement and Shipbuilding Industry Targets of Fourth 5 Year Plan

① Navigation Improvement

* Navigation Aid Facilities	
a) Lighthouses	108
b) Light Beacons	105
* Marker Laying Boats	33
* Port Control Boats	76

② Shipbuilding Industry

* New construction/Repair of Docks	380,566 DWT

(2) Maritime Sector Development Programme

This Programme was prepared in 1982 as the basic programme to determine the maritime policy. Based on the economic and technical analyses of the current ports, sea communications, shipbuilding industry, sea routes and transportation between solitary islands, etc., the Programme pointed out those factors preventing their development and suggested a 3-stage development, i.e. preparation period (1982), research period (1983 - 1984) and implementation period (1985 - 1988).

(3) Integrated Sea Communications Manpower Development and Training Master Plan

DHV Consulting Engineers Co., based in Europe, under took a study to expand the section dealing with manpower development and training in the Maritime Sector Development Programme and the Master Plan for Manpower Development was prepared based on the study between June and October, 1983. The master Plan covers not only seamen training but also manpower development in those fields which are indispensable for the smooth development of Indonesian sea communications.

2-1-4 Proposed Maritime Sector Training Project

Based on the Maritime Sector Development Programme and the Integrated Sea Communications Manpower Development and Training Master Plan described in 2-1-3 above, an Appraisal Mission (September 26 - October 17, 1985) of the IBRD prepared the Proposed Maritime Sector Training Project as an action programme for manpower development in the maritime sector.

This Project suggest following improvements or expansions for seamen training.

(1) Improvement of the facilities and educational effects at the Semarang and Ujung Pandang Academies.
(2) Transfer of the Jakarta Marine Academy to Tanjarang (near Sukarno International Airport in Jakarta) and its expansion.
(3) New foundation of a maritime institute on the former site of the Jakarta Maritime Academy offering comprehensive training facilities for pilots, future executives of shipping companies, public servants in sea communication fields and teachers.
(4) General renewal and improvement of the Seaman's Certificate and the examination systems.
(5) New establishment of rating schools in Ambon and Bengkulu.
(6) Introduction of in-house training systems for both public and private companies.
(7) Strengthening and improvement of the efficiency of the Directorate General of Sea Communications and the Education and Training Centre for Sea Communications.

The Governments of Japan and Holland have, in principle, agreed to extend grant aid for the implementation of the Project in cooperation with the IBRD and the loan agreement for approximately 3 billion yen was concluded in October, 1985.

2-1-5 Current Situation and Problems of Seamen Training

According to the materials provided by the Directorate General of Sea Communications, the number of qualified seamen and the number of those who completed a short training course before boarding are as shown in Table 1 below.

Table 1 Number of Qualified Seamen

	Qualification	Grade	No.
Deck Dept.	MPB I	Captain (Ocean)	450
	MPB II	First Mate (Ocean)	400
	MPB III	Second Mate (Ocean)	1,050
	MPI	Mate (Home Waters)	2,900
	MPT	Mate (Coastal)	3,000
Engine Dept.	AMKC	Chief Engineer	250
	AMKB	Second Engineer	350
	AMKA	Third Engineer	950
	AMK IS/PI	Engineer	3,350
	JS/JM	Engine Driver	4,000
Radio Commun-ication	Telegraphy	Grade I and II Radio Operator	275
	Telephone	Telephone Operator	825
Cadet	Rating Deck	Deck Cadet	10,800
	Rating Engine	Engine Room Cadet	7,000
	Rating Catering	Catering Cadet	3,500

In addition, some tens of thousands of untrained and unregistered seamen are assumed to be either working or waiting for job offers. The fact that most of these untrained seamen are working for small or medium size boats operating between home water islands or for coastal services does not seem irrelevant to the series of disasters at sea which officially claimed the lives of over 4,000 men in the 6 years between 1980 and 1985 despite the relatively favourable sea climate of the Indonesian sea area.

The STCW Convention enforced in 1984 was adopted to prevent such disasters at sea. Along with comprehensive maritime policies (i.e. improvement of old vessels, navigation aid and port facilities and rescue system, etc.), the expansion and consolidation

of seamen training are urgent requirements to save human lives and to prepare the foundation for the development of sea communications.

Note: STCW Convention

The grounding of the Liberian tanker, Torry Canyon, in the English Channel in 1967 and the subsequent serious pollution along the entire coast of Normandy initiated efforts centering on the IMCO (Inter-Government Maritime Consultation Organization) to establish international standards concerning the knowledge and skills of seamen in order to prevent disasters at sea deriving from inadequate navigational skills.

As a result of these efforts, an international conference to discuss seamen training and seamen's certificates was held in 1978 with the participation of 72 countries covering almost all countries related to sea communications. At this conference, the STCW Convention (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978) was adopted and subsequently enforced in 1984 when the enforcement requirements were met. The general responsibilities of the parties to the Convention are described in the following excerpts from the Convention.

THE PARTIES TO THIS CONVENTION,

Desiring to promote safety of life and property at sea and the protection of the marine environment by establishing in common agreement international standards of training, certification and watchkeeping for seafarers,

CONSIDERING that this end may best be achieved by the conclusion of an International Convention on Standards of Training, Certification and Watchkeeping for Seafarers ...

The Parties undertake to promulgate all laws, decrees, orders and regulations and to take all other steps ... so as to ensure that, from the point of view of safety of life and property at sea and the protection of the marine environment, seafarers on board ships are qualified and fit for their duties.

The Japanese Diet voted for accession to the Convention in April, 1982 and the accession document was deposited with the IMO (ex-IMCO) on May 27, 1982, thus making Japan a signatory country. while Indonesia has not yet accessed to the Convention, it is said that preparations to do so are currently being made.

2-1-6 Forecast of Seamen Training Demand

It is difficult to obtain an accurate forecast of the demand for seamen training in view of the fact that major uncertain factors are involved, such as the business trend of the shipping industry, the degree of technological advancement, the natural decline in the number of seamen and the change of jobs by seamen, etc. Althouh a forecast upto 1989 by the Directorate General of Sea Communications is available, the estimates in this forecast should preferably be lowered as the Scrap and Build Programme has not progressed as anticipated.

Based on the comparison between the present situation of seamen training and the demand forecast, the following problems can be pointed out.

(1) The current structure of seamen training facilities, consisting of 4 national maritime academies and 1 rating school, does not satisfactorily meet the present demand for seamen. While the supply of ocean-going seamen is secured, there is a shortage of seamen for home water shipping.
(2) This gap in the supply of seamen has been filled by traditional short training courses lasting around 1 week which are conducted by port managers. As these courses provide a short-cut, those people wanting quick access to working on board tend to register for them. Although these courses will eventually be withdrawn in view of the requirements of the STCW Convention, they will continue for the foreseeable future because of the general shortage of seamen in Indonesia.

Improvement of the facilities, equipment and machinery at the 4 maritime academies and the foundation of 3 new rating schools have been planned to respond to the requirements of the Convention and it is said that large, joint financing by the IBRD and the Governments of Holland and Japan is forthcoming.

With regard to the foundation of new rating schools, the Dutch Government plans to set up a school in Medan, Sumatra with an IBRD loan. The Japanese Government is also expected to carry out a feasibility study on rating schools in Surabaya and Ambon in the future.

If the foundation of these rating schools is realised, the shortage of seamen will be largely solved. Many difficulties must yet, however, be overcome.

2-2 Outline of Ujung Pandang Rating School

In response to the request made by the Indonesian Government to the Japanese Government, JICA sent to Indonesia the Ujung Pandang Rating School Basic Design Study Team and subsequently the report was worked out on the basis of the study results of the team. The actual construction of the school buildings was carried out between 1979 and 1980 and the school was completed and handed over to the Indonesian Government in March, 1980.

It is now 6 years since the school opened in June, 1980 and with the self-reliant efforts on the Indonesian side and the appropriate guidance by the experts despatched from Japan, the school has been smoothly managed, showing increasingly positive results in the education and training of seamen.

2-2-1 Objective of the School

The objective of the Ujung Pandang Rating School is the provision of further education for already qualified seamen and the training of students wishing to become seamen in the future.

2-2-2 Budget and Organization

(1) Budget

The transition of the school budget, from its opening in 1980 to the present (1986), is shown in Table 2.

Table 2 Transition of School Budget

Year	Budget
1980	192,000,000
1981	231,000,000
1982	260,000,000
1983	187,000,000
1984 - 1985	230,000,000 (Project)[1]
	211,299,000 (Routine)[2]
1985 - 1986	167,000,000 (Project)[1]
	238,905,000 (Routine)[2]

(Unit: Rp)

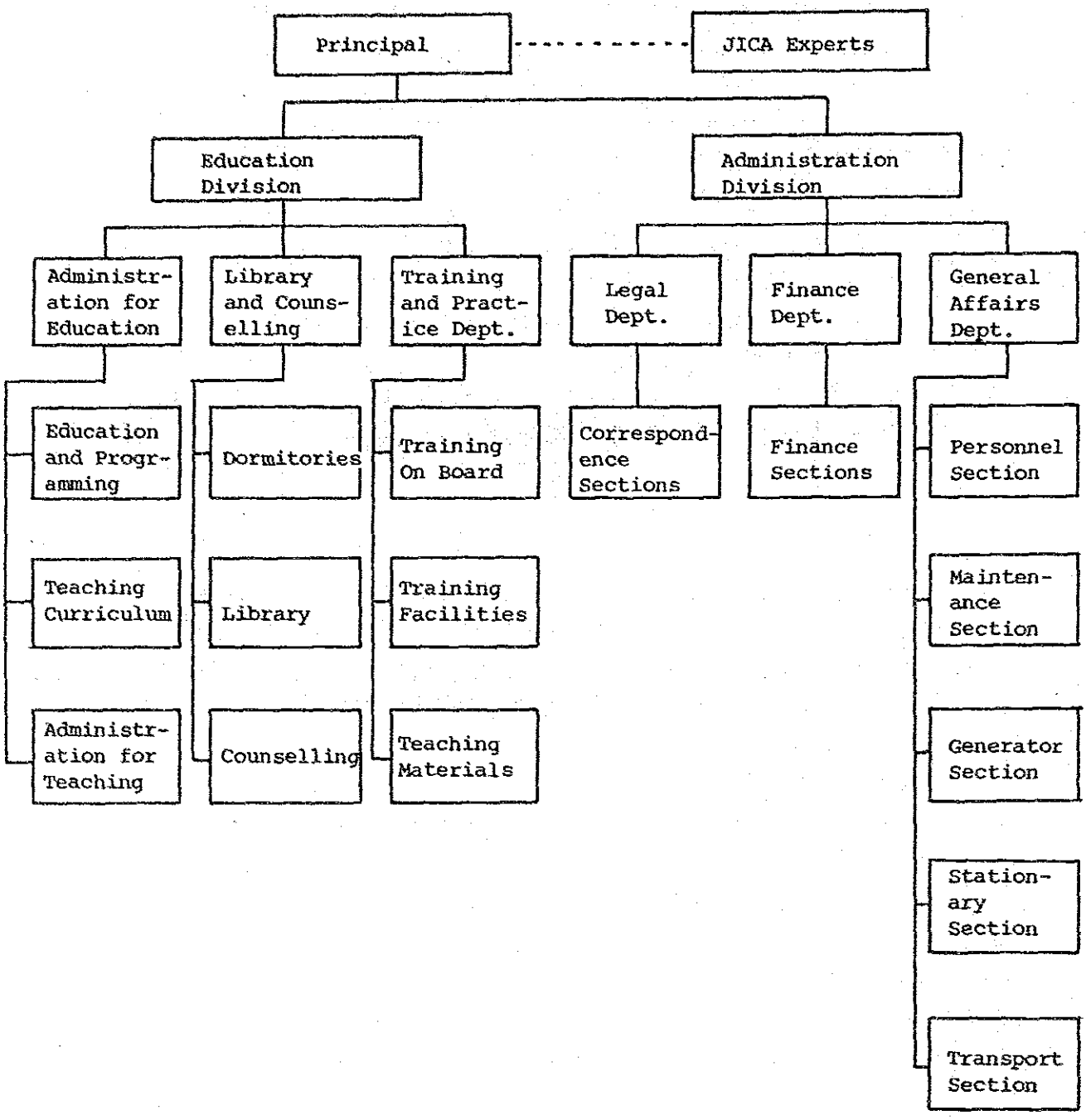
Notes: 1) Project denotes the budget portion for the special management projects of the school.

2) Routine denotes the budget portion for the ordinary management of the school.

(2) Organization of the School

Fig. 2 shows the organization of the Ujung Pandang Rating School.

Fig. 2 Organization of Ujung Pandang Rating School



2-2-3 Seamen Training System

The School's seamen training system is as follows:

(1) Training Courses

From its opening in June, 1980 until September, 1983, the School mainly provided further education and training for already qualified seamen. Since January, 1984, however, the School has accepted new graduates from junior high schools.

The further education courses are divided into the navigation course and the engine course. During the 6 month's education and training period, the trainees are taught the knowledge and practical skills necessary for seamen. Upon completion of these courses, the trainees then sit for the certificate examinations and upon receiving these certificates, resume their work on board.

Junior high school graduates initially join the PD-I, Sm-1 Course for 3 months' classroom study and 3 month's practical training. They then move to the PD-II, Sm-2 Course (6 months) and then move again to the PD-III, Sm-3 Course and Sm-4 Course (6 months each) to become mates or engineers for home water shipping. The students must pass the examinations held by the National Examination Board in order to gain the qualifying certificates.

*PD-I, II, III: (Rating) Elementary Courses for Seamen
Sm-1, 2,3 : (Semester) 1 Semester lasts 6 months

The School's education system is illustrated in Figs. 3 and 4.

Fig. 3 Education System of Ujung Pandang Rating School

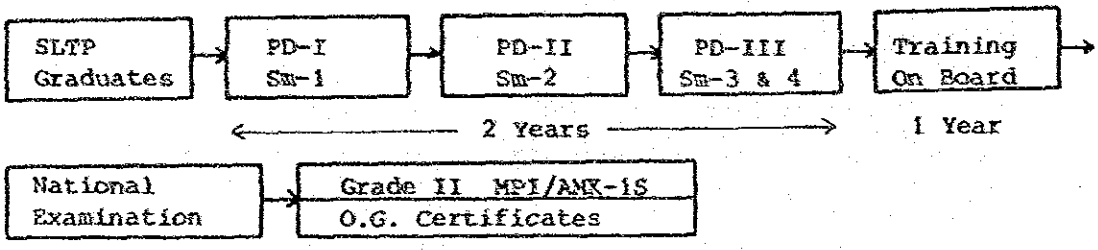
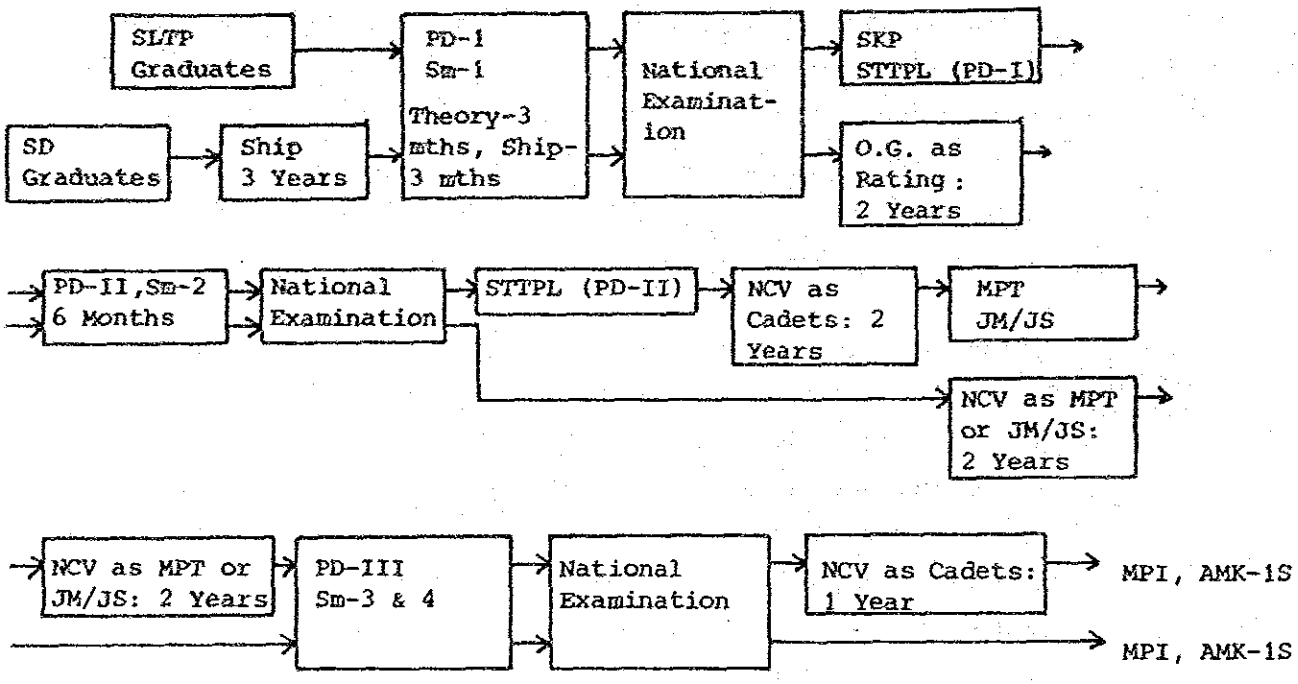


Fig. 4 Education Programme and Certificates



Abbreviations

SLTP: Junior High School
SD: Primary School
PD: Rating
Sm: Semester
SKP: Certificate of Rating
STTPL: Certificate of Graduation of Education and Training
MPT: Certificate of Navigator (Limited to Near Coastal Voyage)
JM/JS: Certificate of Machine Operator
MPI: Certificate of Navigator (Near Coastal Voyage)
AMK-IS: Certificate of Engineer (Near Coastal Voyage)
O.G.: Ocean Going

(2) Admittance Numbers and Graduates

Between 1980 and 1983, 899 students were admitted to the School for further education (481 for the Navigation Course and 418 for the Engineer Course). Of these, 840 went on to pass the graduation examination. the remaining 59 failed to complete their courses due to financial or other reasons.

233 (PD-I) junior high school graduates were admitted between 1984 and 1986 (139 for the Navigator Course and 94 for the Engineer Course), out of which 231 (PD-III) (119 for the Navigator Course and 112 for the Engineer Course) passed the graduation examination following their completion of the PD-III.

Table 3 shows the number of those admitted to the School and the number of graduates since its opening.

Table 3 Number of Admitted and Graduated Students for Each Year

	Course		Admitted	Graduated	Withdrew	Remarks
1980 (Jun. - Nov.)	N		91	80	11	For Further Education
	T		76	67	9	
1980 - 1981 (Dec. - July)	N		61	59	2	
	T		64	59	5	"
1981 - 1982 (Jan. - Feb.)	N		42	32	10	
	T		36	29	7	"
1982 (Apr. - Sept.)	N		113	109	4	
	T		70	68	2	"
1982 - 1983 (Sept. - Mar.)	N		102	97	5	
	T		101	100	1	"
1983 (Mar. - Sept.)	N		72	71	1	
	T		71	69	2	"
1984 (Jan. - July)	PD-II	N	39	32	7	J.H. School Graduates
		T	34	33	1	
	PD-I	N	24	-	2	
		T	0	-	0	
1984 (July - Dec.)	PD-I	N	80	78	2	
		T	61	52	9	
	PD-III	N	21	21	0	
		T	22	21	1	
1985 (Jun. - July)	PD-II	N	49	42	7	
		T	47	43	4	
	PD-III	N	21	21	0	
		T	21	21	0	
1985 (July - Dec.)	PD-I	N	35	32	3	
		T	33	30	3	
	PD-III	N	40	40	0	
		T	39	36	3	
1986 (Jan. - July)	PD-II	N	32	28	4	
		T	30	28	2	
	PD-III	N	40	37	3	
		T	36	34	2	

Remarks N: Navigator Course
T: Engineer Course

(3) Employment Situation for School's Graduates

Having acquired navigator or engineer qualifications on passing the national examination, the School's graduates have a choice of working for coastal ships or ocean going ships. In view of the school's educational objective, their finding employment with ocean going ships is the proper course. Most graduates, however, tend to prefer working on coastal ships.

Graduates of the further education course have no difficulty finding employment with their previous employers. Those graduates who entered the School after graduating from junior high school, however, have some difficulties in securing employment due to the world-wide depression in the shipping industry and, therefore, the problem of their finding employment has now assumed very serious proportions.

2-2-4 Education and Training Curriculum

In the case of both the Navigator Course and the Engineer Course, the education and training curriculum is divided into basic, general and specialised subjects, which in turn are divided into classroom studies (theory) and practical training.

Religion, national principles, physical education and seamen training comprise the basic subjects. There are 6 units of classroom studies and 12 units of practical training for both courses.

The general subjects include language study, mathematics, physics, law and first-aid, etc. and are the same for both courses. There are a total of 15 units of classroom studies and 8 units of practical training, including 2 units of first-aid.

Specialised subjects are separately provided for each course and consist of 13 units of classroom studies and 74 units of practical training, showing the overwhelming stress on practical training.

Table 4 Subjects and Number of Units

Course / Subjects	Navigator Course			Engineer Course		
	Classroom Study	Practical Training	Total	Classroom Study	Practical Training	Total
Basic Subjects						
Religion	3	-	3	3	-	3
National Principles	3	-	3	3	-	3
Physical Education	-	6	6	-	6	6
Seamen Training	-	6	6	-	6	6
General Subjects						
Indonesian	3	-	3	3	-	3
English	2	4	6	2	4	6
Mathematics	5	-	5	5	-	5
Science	1	2	3	1	2	3
Physics	2	-	2	2	-	2
International Law	1	-	1	1	-	1
Law	1	-	1	1	-	1
First-Aid	-	2	2	-	2	2
Special Subjects						
Shipbuilding	1	4	5	-	2	2
Navigation	-	8	8	-	-	-
Ship Maintenance	-	6	6	-	6	6
Automatic Control	-	2	2	-	2	2
Knots	-	4	4	-	-	-
Ocean Survival	-	4	4	-	4	4
Fire-Fighting	-	4	4	-	4	4
Seamanship	-	5	5	-	-	-
Cargo Loading	-	6	6	-	6	6
Stability	2	-	2	2	-	2
Navigation Instruments	-	4	4	-	4	4
Maritime Law	3	-	3	2	-	2
General Ship Knowledge	2	-	2	2	-	2
Signals	-	4	4	-	4	4
Commands	1	4	5	-	-	-
Chart Work	-	6	6	-	-	-
Electricity	-	1	1	-	4	4
Maritime Weather	1	-	1	-	-	-
Engine Training	-	-	-	-	8	8
Ship Maintenance	-	-	-	1	6	7
Automatic Control	-	-	-	1	2	3
Machine Tooling	-	-	-	-	4	4
Machine Power	-	-	-	-	6	6
Steam Power	-	-	-	-	4	4
Boilers	-	-	-	2	4	6
Auxiliary Engine	-	-	-	-	4	4
Safety Work	-	-	-	2	2	4
Drawing	-	-	-	-	8	8
Materials	-	-	-	2	-	2
Others	-	12	12	-	-	-
Total	31	94	125	31	94	125

2-2-5 Acceptance of the Third Country Training

The Indonesian Government held the first Third Country Training Session during the 3 months between October 4 and December 8, 1986, using the facilities at the Ujung Pandang Rating School, as the host country for the ASEAN Pacific Human Development Programme aiming at the development and training of seamen who will play central roles in the future shipping industries of Asian and Pacific countries.

The operation cost of this training session was borne by JICA while the cost of inviting external lecturers was borne by Indonesia (from the budget for the Ujung Pandang Rating School).

Trainees were sent from many Asian and Pacific countries (i.e. Indonesia, Philippines, Thailand, Brunei, Micronesia, Western Samoa, Fiji, Kiribati and Tuvalu) and were selected on the basis of their having seaman's certificates and considerable on board experience. The trainees took either the Navigator Course or the Engineer Course and, on completion of the session, returned home to serve as instructors in their respective countries.

As this Programme is expected to take place every year, the Ujung Pandang Rating School will play an important role in this regard.

Table 5 shows the curriculums for the Participant of the Programme.

Table 5 Curriculums for ASEAN Pacific Human Development Programme

Navigator Course		Engineer Course	
Subject	Hours	Subject	Hours
Indonesian	12	Indonesian	12
Mathematics/Medicine	48	Mathematics/Medicine	48
Teaching Techniques	60	Teaching Techniques	60
Deck Work/Maintenance	96	Fire Prevention/Ocean Survival	96
Maritime Weather	60	Maritime Law	12
Shipbuilding/Ship Structure	24	First-Aid	12
Navigation	18	Automatic Control	24
Navigation Equipment	36	Engine Drawing	12
Prevention of Collisions at Sea	18	Engines/Electricity	24
Cargo Loading/Stability	24	Internal Combustion Engines	36
Signals	12	Engine Work	60
Automatic Control	24	Boilers/Steam Equipment	36
Maritime Law	18	Auxiliary Engines	36
First Aid	42	Machine Tools	12
Practical Training	48	Shipbuilding/Ship Structure	12
Study Tours	24	Safety Work	12
		Practical Training	48
		Study Tours	24
Total	576	Total	576

2-2-6 Outline of Facilities and Equipment

The facilities and equipment of the School are outlined as follows:

(1) Facilities

1) Buildings

Name of Building	No.of Stories	Floor Area (m^2)	Remarks
Main Buildings	2	2,054.21	Built in 1980 with Grant Aid from Japan
Practical Training Building	1	789.88	"
Refectory	1	789.88	"
Dormitory Buildings	2	2,054.21	"
Boat House	1	182.25	"
Mechanical Equipment Building	1	295	"
Library	1	210 (Approx.)	Built with Indonesian Funding
Clinic Building		150 (Approx.)	"
Fire-Fighting Model Ship		360 (Approx.)	"
Garage		160 (Approx.)	"

2) Training Facilities

Name of Facilities	Description	Remarks
Groyne	165m (L) x 35m (W)	Built in 1980 with Grant Aid from Japan
Cargo Crane	Motor Operated	"
Boat David	Manually Operated	"

3) Training Equipment

Name of Equipment	No.
Life Boat	1
Cutters	3
Equipment for Deck and Engine Depts.	Various Types

(2) Equipment

The major equipment currently installed at the existing facilities is listed in Table 6.

Table 6 Equipment List

Equipment	Q'ty	Equipment	Q'ty
Life boat with engine	1	Hand signal flag	36
Cutters	3	International signal flag	2
Navigation aids model	1	Signal lamp	1
Magnet compass	1	Ships light	1
Boat compass	1	Black ball	1
Azimuth ring	1	Ships bell	1
Azimuth mirror	1	Fog horn	1
Hand lead	2	Structural model of freighter	1
Sextant	6	Structural model of tanker	1
Chronometer	1	" container	1
Terrestrial glove	1	" model of ore carrier	1
Echo sounder	1	" " steel ships (steam model)	1
Gyro compass repeater	1		
Strucutral model of cargo gear	1	" " steel ships (central part model)	1
Model of various kind of slings	1	" " steel ships (stern part model)	1
Structural model of david operation	1	Structual model of anchor and anchor chain	1
Various kinds of tackles	1	Structural model of rudders	1
Sample of wire rope	2	Inflatable life raft (miniature)	2
Sample of rope knotting	1		
Gas detector	1	Life buoy ring	1
Poisonous gas detector	1	Inflatable life raft (with accessory)	1
Oxygen detector	1		
Gas mask	1	Parachute flare signal	1
Breathing apparatus	1	Smoke signal	1
Safety lamp	1	Daylight signal mirror	1
Fire-proof suit	1	Self ignition light	1
Anti-acid glove	1	Blue flame signal	1
Life jacket	3	Red flame signal	1
Inflatable life-jacket	2	Rocket signal	2
Life buoy	2	Line throwing appliance	2

Equipment	Q'ty	Equipment	Q'ty
Sea anchor	1	Single-coil voltage regulators	10
Model of anchoring and mooring	1	Batteries 12V & 6V	10
Patent log	1	Testers	11
Rat guard	1	Air compressor	1
Electro-hydraulic pump steering gear model	1	Lathe	1
Reversing clutch model	1	Disc grinder	1
Daylight signal lamp	1	Electric drill	1
Binoculars	5	Hand drill	1
Aneroid barometer	1	Bench drilling machine	1
Wind direction - velocity computer	10	Bench grinder	1
Anemometer	1	Electric grinder	1
Hygrometer	2	Level vials	2
Thermometer	1	Gas welding machine	2
Transceiver	8	Electric welding machine	2
Key for luminescent signal	1	Vice	4
Multistage turbine pump model	1	Drawing instrument	1
Variable pitch propeller model	1	Drawing Table	1
Variable discharge pump model	1	Drawing board	1
Induction motor model	1	Marine main diesel engine model	1
Electro-hydraulic pump steering gear model	1	Diesel engine fuel pump model	1
Reversing clutch model	1	Generator model for AC & DC	1
Marine main diesel engine model	1	Demonstration universal-meter for DC	1
Generator model for AC & DC	1	Rotating magnetic field demonstrator	1
Hoist crane	1	Electro magnetic phonemena demonstration output	1
Torque wrench	1	AC Generator model	1
Meggers	1	Water tube boiler model	1
Thermo-couple	1	Superchanging system model	1

Equipment	Q'ty	Equipment	Q'ty
Model of stern tube propeller and rudder	1	DC Ampere meter	1
		Refrigeraring plant	1
Semi conductor sample set	1	Parallel vice	1
AC Ampere meter	1	Boiler simurator	1
DC Volt meter	1	Fireman's wear set	5
AC Volt meter	1	Fire extinguisher	10
Centrifugal pump	1	Fire estinguisher nozzle	5
Turbine pump	1	Life vest	40
Gear pump	1	Helmet	40
Transformer	1	Slide rule for wind	40
Autotransformer	1	Various type of scale	
Silicon rectifier	1	Various type of machine tool	

2-3 Present Situation and Problems of Facilities

2-3-1 Main Buildings and Facilities

There are no particular problems in regard to the facilities and management of the main buildings which house the teachers' room, dormitories, refectory and kitchen, etc., in addition to the lecture rooms. Such additional facilities as the library and clinic have proved to be adequate and have been satisfactorily managed.

The problem of a clean water supply shortage has been mitigated by the use of groundwater. The partial inadequacy of the drainage facility has also been taken care of by the School.

With regard to the practical training facilities, there is an inadequate provision of teaching equipment and space, verifying the appropriateness of the School's present request for additional facilities and equipment. Based on the School's request and the results of the field survey, it has been decided to build a new training workshop (approximately 355 m^2) on a lot adjacent to the existing building housing the practical training room and to equip it with practical training equipment for both the Navigator and Engineer Courses.

The new equipment should be appropriate for the School and the provision of high-level facilities and equipment simply for the sake of providing them should be discouraged.

2-3-2 Cutter Launching System and Groyne

Cutter training is an indispensable part of seamen training. At the time of the School's opening in 1980, a groyne was also constructed (protected by a breakwater) for lifting and launching cutters. Since then, however, silting sand from the Djene Berang River in the north of Barombong where the School is located has been accumulating in the groyne, making cutter landing and entrance to the groyne difficult. This already posed a serious problem in 1981 and has not yet been solved. The accumulated

sand is currently continuously dredged using a motor pump, barely maintaining the necessary water depth. As the accumulation of the silting sand is expected to continue, however, it would appear that dredging is futile in the face of this overwhelming natural phenomenon.

When it is difficult to moor the cutters or the training ship (approximately 30 DWT) to the groyne, they must be diverted to Ujung Pandang Port, forcing the students to travel 27 km by land for cutter or ship training. As the students then have to cover the same distance on their return to the School, a great deal of time and effort is wasted.

With regard to this standing problem of the groyne, the conclusion of the Preliminary Study conducted by the official mission in May, 1986 recommended that the possible introduction of a new cutter launching system be considered, assuming a future situation where the groyne is no longer serviceable.

The present study carefully examined the 3 methods suggested in the Preliminary Study and a decision was made to adopt the bogie method using a winch. It was also decided to construct a jetty to allow th cutters to be easily boarded. Based on the results of the sounding of the sea area for this proposed jetty, the construction of a wooden jetty some 30 m in length, stretching from the end of the existing westward pier of the groyne to the sea, was suggested. The construction of this jetty will solve the problems concerning the launching and mooring of the cutters, cutter boarding and unboarding and related training.

2-3-3 STCW Convention and Required Facilities and Equipment

The 1978 STCW Convention specifies the desire of its signatories to improve the safety of seafarers and property at sea and to promote the protection of the marine environment by the setting up of international standards for the training, certification and watchkeeping for seafarers and that these objectives could be

best achieved by an international convention on the standards for the training, certification and watchkeeping for seafarers.

As the Indonesian Government is currently preparing to ratify and join the Convention, the Ujung Pandang Rating School is preparing to expand and improve its teaching facilities and equipment in order to satisfy the educational and training standards required by the Convention. The resulting request to the Japanese Government by the School puts particular emphasis on educational equipment with the following major items.

* Various types of navigation training equipment
* Various types of survival training equipment
* Various types of fire-fighting equipment
* Various types of deck department equipment
* Various types of engine department equipment
* Various types of audio-visual teaching equipment
* School buses

The audio-visual equipment in particular is expected to be extremely effective, not only as an aid for classroom teaching and practical training, but also in enabling the students to pursue the required knowledge and skills on their own.

CHAPTER 3

PROJECT CONTENTS

CHAPTER 3. PROJECT CONTENTS

3-1 Objectives

After the STCW Convention came into effect in 1984, the Indonesian Government commenced the procedure to ratify and join the Convention while the Ujung Pandang Rating School began preparations to both modernise and expand its educational and training facilities and equipment to respond to the Convention's international standards for improved seamen qualifications and for the prevention of disasters at sea.

In addition, some of the School's existing equipment has become time-worn in the 6 years' period since the School opened. The Project, therefore, intends the replacement of this old equipment, as well as the modernisation of the facilities and equipment, in order to improve the education of the students at the School. The School has requested grant aid from the Japanese Government to achieve these objectives.

3-2 Contents of the Request

A list of the items for which the grant aid has been requested is given in Table 7.

Table 7 List of Requested Items

Item	Qty.	Description	Intended Use
I Navigation Aid Equipment			For practical training in Navigator Course
Steering Trainer	1		
Gyro Compass	1		
Radar Observation Trainer	1		
Engine Telegraph	1	Electric Type	
Radar Plotting Board	2		
Chart Table Lamp	10		
Sextant	15		
Stop Watch	5		
Chronometer	2		
II Survival Training Equipment			For ocean survival training
Inflatable Life Raft	2		
Life Saving Signal Flares			
Single Red Flame	5 doz.		
Parachute Signal Flare	5 doz.		
Smoke Signal	3 doz.		
Self-Ignition Light	5		
Line-Throwing Appliance	1		
Cutter	3		To replace existing old cutters
Skin Diving Equipment			For maintenance of training ship and for skin diving training
Wet Suit	2		
Breathing Apparatus	2		
Mask	2		
Fin	2 pairs		
Air Compressor	1		
III Fire-Fighting Equipment			For fire-fighting training
Portable Fire Pump	1		
Breathing Apparatus	12		

Fire Hose	10	1.5" x 20m, canvas	
Fire Hose	2	2.5" x 20m, canvas	
Fire Hose	10	1.5" x 20m, coated canvas	
Fire Hose	2	2.5" x 20m, coated canvas	
Nozzle	4 each	1.5" type and 2.5" type	
HALON-type Fire Extinguisher	1 for each type		
Fire Alarm System	1 for each type	smoke detector, optical smoke detector, thermal detector and manual alarm	
IV Deck Department Equipment			
Cutter Launching Apparatus	1		
Ship Chandlery			For practical training in Navigator Course
Rope	5 coils		
Wire Rope	1 coil		
Canvas	50m each	No.2-No.6 types	
Signal Light	2		
V Engine Department Equipment			For practical training in Engineer Course
Forging Facilities			
Furnace and Blower	1		
Anvil	10		
Swage Block	10		
Round Tup	40		
Flat Tup	40		
Square Tup	40		
Round Swage	40		

Square Swage	40		
Cross Hammer	20	10kg	
Cross Hammer	20	5kg	
Cross Hammer	20	2kg	
Flat Tongs	20 pairs		
Round Tongs	20 pairs		
Spicular Tongs	20 pairs		
Scoop Tongs	20 pairs		
Machine Tools			
Lathe	3		
Universal Machine	1		
Gas Welding Set	1		
Arc Welding Set	1		
Boiler Plant	1		
Engine Room Model			
Diesel Plant	1	Model	
Steam Turbine Plant	1	Wall Chart	
Automatic Control Equipment			
Temperature Control System	1		
Press. Control System	1		
Level Control System	1		
Pneumatic Control System	1	Model	
Electric Control System	1	Model	
Hydraulic Control System	1	Model	
M/E Remote Control System	1	Model	
Control Valves of all kind Cross Sec.	1	Model	
Electric Training Facilities			
Multi-Purpose Circuit	10		
Electronic Circuit	10		
Metal Testing Machine			
Hardness Testing Machine	1		
Stress Testing Machine	1		

Drafting Equipment	25 sets		
Transceiver	6 sets		For in-school communications and communications training
VI Training Workshop	1	Approx. 510m^2, 2-stories	To house practical training equipment
VII Audio-Visual Equipment			For audio-visual education
Video Cassette Recorder	1		
Monitor TV	3		
Portable Video Camera	1		
Overhead Projector	1		
OHP Screen	1		
VIII School Buses			To replace old existing buses
Bus	1	40 seats	For transport of students for training or visits
Bus	2	24 seats	For transport of Navigator and Engineer Courses' students
Mini-Bus	1	8-10 seats	For school business
IX Jetty	1		For cutter boarding/ unboarding and related training
X Others		Reference book	

3-3 Examination of Contents of the Request

With regard to the requested items described in 3-2, the Study Team held a series of discussions with Indonesian officials and people related to the School in order to understand the current situation of the education and training at the School. Based on a thorough understanding of the Indonesian intentions concerning the objectives of the Project and the requested items and also with reference to the results of the Preliminary Study conducted in May, 1986, the present Study Team carried out an examination of each item.

The resulting basic policy is that those facilities and equipment to be granted to the School should be consistent with the School's objective, i.e. the education of seamen. In addition, the following were also decided.

(1) The equipment for the new training subjects required by the STCW Convention should be granted.
(2) The new equipment in regard to the boiler plant and automatic control should be granted and a new training workshop to house them should be constructed.
(3) A new jetty should be constructed to solve those problems relating to cutter launching and training.

Concrete items, their specifications and quantities, etc. were also examined based on discussions with the School.

3-4 Project Summary

The Project's executive organization, management system and the subject area and its situation, etc. are summarised below.

3-4-1 Executive Organization

The executive organization for the Project is the Education and Training Centre for Sea Communications which is the organization given overall responsibility for seamen training by the Indonesian Government. The Ujung Pandang Rating School is under

the control of the Centre and, therefore, the Centre provides the School with administrative control and guidance in regard to its management.

Since the subject of the Japanese grant aid is the Improvement Project for the Ujung Pandang Rating School, the granted facilities and equipment should, therefore, be efficiently utilised and maintained by the School.

3-4-2 Management System

As Figure 2 shows, the School is managed by the Principal and the Department Heads. The self-reliant efforts on the Indonesian side, including the School's staff, should be duly evaluated. Also, the technical assistance provided by the Japanese experts at the School cannot be ignored in terms of the School's efficient management. Japanese experts have been sent to the School ever since it was opened and have played an important role not only in the school management but also in regard to the preparation of the educational and training curriculums and texts.

3-4-3 Project Location and Its Situation

The Ujung Pandang Rating School is located in the area of Baronbong, some 9 km south of Ujung Pandang (the School is known locally as the Baronbong Rating School). It takes approximately 45 minutes by car from the city to the School.

3-4-4 Training Workshop

The planned site for the new training workshop is the vacant land surrounded by the existing buildings which were radially constructed. It is well levelled and is currently used as a sports ground for the students.

This location has been selected due to its proximity to the existing training room in the main building and its easy access by the students.

3-4-5 Jetty

The existing boat house and groyne are located to the west of the main building, facing Makassar Strait. The planned, new, wooden jetty will stretch for some 30 m from the end of the westward pier of the jetty to the sea. The site's sandy coast is shallow for a great distance from the shore and has a gradual slope. The wind direction changes from the south-west in the rainy season to the north-west in the dry season. As the wind force is relatively weak all year round, the waves seldom reach 3 m high. The maximum range of the tide is approximately 1.4 m.

3-4-6 Pavement

It is planned to construct a pavement along the coastline in order that the bogie system can be employed for the launching or lifting of the cutters. The planned pavement length is some 98 m, running alongside the existing groyne pier from around the boat house to the shore. The section near the shore will be paved with concrete for several meters and the remainder will be paved with sand-surfaced asphalt.

3-5 Technical Cooperation

Since the School's opening in 1980 up until the present, the Japanese Government has sent 1 advisor to the Education and Training Centre and 2 JICA experts to the School itself to promote the education and training of seamen in Indonesia.

These specialists have provided technical cooperation for the School's smooth management. Belonging to either the Navigator Course or the Engineer Course, they have both been mainly engaged in providing advice on educational and training guidelines, the preparation of curricula and texts and offering instruction and advice in regard to other fields concerning the management of the School.

CHAPTER 4

BASIC DESIGN

CHAPTER 4. BASIC DESIGN

4-1 Basic Policy

The basic design has been prepared based on the following with reference to the results of the "Improvement Project Preliminary Study for the Ujung Pandang Rating School in the Republic of Indonesia" conducted between late May and early June, 1986 and the "Basic Design Study for the Improvement Project for the Ujung Pandang Rating School in the Republic of Indonesia" conducted from late October through mid. November of the same year.

(1) The design should integrate the contents requested by the Indonesian side as much as possible.
(2) The harmonious development with the existing buildings should be aimed at, taking the design intentions of these buildings into account.
(3) The design should consider the climatic and weather conditions of the planned site.
(4) The design should permit the easy maintenance and management of the new facilities, corresponding to the local living environment.
(5) Building materials available locally should be used.
(6) Consideration should be given to the local level of construction technology.
(7) The design standards should, in principle, be suitable for the local conditions.

4-1-1 Equipment Plan

While Indonesia is currently facing the problem of training capable seamen in order for the STCW Convention to be ratified, the Ujung Pandang Rating School is now in its sixth year and some of its equipment is showing signs of age. Against this background, the Basic Design Study for the Improvement project for the Ujung Pandang Rating School was conducted.

The list of the necessary educational and training equipment for a rating school was designed based on the list of required equipment prepared during the Preliminary Study and taking into consideration the requests of the Indonesian counterpart, the education and training curricula of the School and the cost-benefit analysis results for each item. With regard to that equipment, etc. other than shown in the drawing of the training workshop, the design was prepared on the understanding that the School will secure adequate installation space in the existing buildings.

(1) Navigation Aid Equipment

1) Steering Trainer

The steering trainer is designed to give an actual feeling of steering and is assisted by visual effects showing various conditions in order for those students aiming at becoming watchkeeping seamen to understand the steering check points and acquire the capability to exercise proper judgement.

2) Gyro Compass

The design of the gyro compass is such that the internal structure can be seen from the outside and the relationship between the master compass and the repeater can be understood.

3) Radar Observation Trainer

The radar observation trainer is designed to help those students aiming at becoming watchkeeping seamen acquire the appropriate judgement and feeling of bridge duty by using simulated pictures, which in turn allow the students to determine the location of the ship and to monitor the surrounding situation, including the locations of other ships and coastlines, etc.

4) Engine Telegraph

This equipment is designed to aid students in their understanding of the command system between the bridge and the engine monitoring room in regard to whether the ship should move forward or backward and at what speed, etc.

5) Other Equipment

The provision of radar plotting boards, sextants and chronometers, etc. is also planned as part of the navigation aid equipment.

(2) Survival Training Equipment

1) Inflatable Life Rafts

Thorough training in ocean survival techniques is absolutely necessary to satisfy the requirements of the STCW Convention. The inflatable life rafts are designed for the training required to meet these requirements. The rafts will be appropriately stored by the School.

2) Life Saving Signal Flares

The provision of life saving signal flares, pursuant to the requirements of international treaties, is planned in order for their usage to be taught.

3) Cutters

Cutter training is indispensable, not only as part of life saving training, but also as a measure to nurture the group consciousness for united actions. As the existing wooden cutters are showing signs of deterioration, including decay on the outside planking, they should be replaced by new solid cutters. Accordingly, the provision of cutters made of FRP and of a similar size to the existing cutters is planned.

4) Skin Diving Equipment

The provision of skin diving equipment is designed for the cleaning of shells and the sea repair of the life-boats, cutters and training ship owned by the School.

(3) Fire-Fighting Equipment

This equipment is designed as a supplement to the necessary equipment and also for the improved understanding of the Halon-type fire extinguisher as well as various fire alarm systems. The specifications of this supplementary equipment correspond to those of the existing equipment.

(4) Deck Department Equipment

1) Cutter Launching System

As the groyne facing the sea is expected to become unusable in the future due to the deposit of silting sand, a new system for cutter launching must be provided.

Priority is given to simplicity, reliability and economy and, therefore, the chosen system is that of a cutter being carried on a bogie which is equipped with a hand winch and a manual jack. While manual operation is adopted wherever it is deemed possible, an electric winch is employed to move the bogie. The launching or lifting of the cutter to or from the bogie at the waterside is conducted manually and part of the bogie can be tilted downward to make this operation easier. In addition, the road from the boat house to the waterside will be paved so that the bogie can be easily moved.

(5) Engine Department Equipment

1) Forging Facilities

The forging facilities are designed for the understanding of the basic properties of machine materials and will be located in the existing engine department practical training room.

2) Machine Tools

The existing facilities will be expanded to allow more students to have adequate training in those machine tools and welding equipment required for basic machine tooling and will be located in the existing engine department practical training room.

3) Boiler Plant

The boiler plant combining a boiler and a water softener is designed to enable students to understand the efficient utilisation of a comprehensive system and the functions of the equipment and system interconnections.

As the amount of water available at the School is inadequate, the system is designed to allow the recycling of the cooling water which is not the case on an actual ship. In general, ships use sea water for cooling and simply discharge it after use. The use of sea water at the School's boiler plant has been abandoned, however, as it would necessitate large construction work.

The fuel used is light oil. The supply of fuel to the tank will be carried out manually from the School's existing fuel tank using plastic containers, etc. as a special supply system is not required in view of the fact that the fuel consumption is low due to the small size of the boiler.

4) Engine Room Model

The model engine room of a diesel-engine ship is designed for the understanding of the distribution of the main equipment and the relationship between the equipment and the major piping system. As steam turbine ships are virtually non-existent these days, a wall chart is adopted to show its system. It is decided that the School will secure a place for their display in one of the existing buildings.

5) Automatic Control

Several systems are generally used to control the equipment of a ship. The learning of the basic functions and operations of the temperature, flow, level, electronic and hydraulic control systems is intended through practical training. With regard to the remote control of the main engine, the check points for the operation of the control consoles on the bridge and in the engine room should be mastered. A cross-section of the control valve is provided for the understanding of its structure and functions. From among this control equipment, the temperature, flow, level and hydraulic control system and the remote control system of the main engine will be installed in the new training workshop. The School will find the necessary space for the installation of the other equipment in the existing practical training room.

6) Electric Training Equipment

The electric circuit training equipment is designed for the basic understanding of the voltage, current, resistance and semi-conductor characteristics. The necessary space for the installation of this equipment will be found by the School.

7) Engine Indicator

The combustion situation of the engine and its horsepower can be calculated using the indicator's measurement results. As this is one of the basic study items concerning the engine, its provision is decided based on a request by the School.

8) Drafting Equipment

Drafting is an important subject for students on the Engineer Course. As there is no space in the School for the installation of a number of drafting tables, it is decided to place the drafting boards on top of the stu-

dents' desks. Accordingly, the drafting equipment to be provided satisfies only the minimum requirements. As this equipment can be purchased locally and the quality is the same as in Japan, priority is given to local purchase.

9) Transceivers

Portable transceivers are selected as they are deemed necessary as a means of communication at the School and during training.

(6) Audio-Visual Equipment

The equipment is selected on the principle that effective audio-visual education be carried out using educational video tapes and those tapes recorded by the students showing their training, etc. As this equipment can be purchased locally (excepting the video tapes) and the quality is the same as in Japan, priority is given to local purchase.

(7) Vehicles

A large bus is required to transport the students on both courses to the training ship which is moored at Ujung Pandang Port and to other places where study trips are made.

In some cases, the students of the Navigator and Engineer Courses have to make different trips, necessitating the provision of 2 additional small buses. Furthermore, a minibus is required for the School's administrative purposes as the School is located far from Ujung Pandang city (about 27 km).

The vehicles currently owned by the School have deteriorated to the degree where local maintenance work cannot cope (probably because of the method of use). In view of this situation, the provision of a total of 4 buses appears necessary. As those buses available locally have the same

quality as those in Japan, priority is given to local purchase.

(8) Others

Although the Ujung Pandang Rating School has an excellent reputation in terms of its educational and training curricula and its teaching equipment, there is a noticeable shortage of certain texts and reference books. In view of the strong request made by the Japanese specialists on-the-spot, books which should prove useful are selected.

4-1-2 Facilities Plan

(1) Campus Plan

The current School campus is of a rectangular shape and stretches for some 450 m in the east-west direction and for some 130 m in the north-south direction. An access road is located on the western side of the campus and the eastern side faces Makassar Strait. The campus is divided into 5 zones, i.e. the approach zone from the access road to the front garden where the library and clinic are located, the zone which incorporates the car park, garage and mechanical equipment building, the zone which incorporates the main building, practical training building, refectory and dormitories, the multi-purpose zone which can be used as a sports ground and the sea facility zone. All of these facilities are systematically located along the east-west axis of the campus. In addition, a football ground is located to the south. The service roads to these facilities are located along the north and south boundaries of the School campus.

As the training workshop to be newly constructed will comprise one of the technical training buildings, its location is decided based on the thorough consideration of its relationship with the existing training room, the flow lines, its management, the distribution balance of the workshop in the overall composition of the School and the provision of

plants, etc.

(2) Construction Plan

1) Ground Plan

Based on the examination of those areas for the installation of the new education and training equipment, it is decided that new training rooms, including a boiler plant room, an automatic control training room, a steering training room and a radar monitoring training room, should be constructed.

The floor area for each training room is decided with consideration paid to the functional distribution of the equipment to be installed and adequate space for a class of 25 students. The final decision, however, will be made through intensive discussions with the School. The ground plan of the new training workshop to be constructed adjacent to the existing training building uses a minimum module unit size of 2.250 m which is the basis length of the existing buildings. It is a single story building with a floor area of 11.25 m x 31.5 m. An external corridor is provided on one side of the building and a connecting corridor with a roof is planned between the existing and the new buildings.

The approximate floor area for each training room is 101 m^2 for the boiler plant room, 81 m^2 for the automatic control equipment room, 76 m^2 for the steering training room, 76 m^2 for the radar monitoring training room and 20 m^2 for storage.

2) Structural Plan

The main structure is of reinforced concrete with a rigid frame. The use of a reinforced concrete mat foundation is decided based on the boring data obtained by the previous geological survey. With regard to the earthquake resis-

tance, the design is based on the earthquake load regulations for building designs issued by the Department of Public Works.

As the maximum wind velocity recorded in the past is approximately 15 m/sec, the horizontal wind pressure against buildings is considered to be much less than in Japan. No particular problems are, therefore, anticipated in the structural design of the building in view of wind and earthquakes. It is decided to use the structural materials and construction methods available locally. The structural design and the construction method are the subjects of administrative guidance under the enforcement regulations concerning the standard regulations for buildings issued by the Department of Public Works and, therefore, the design of the Project is based on these standard regulations. The standards specified in the regulations of the Department of Public Works are applied to determine the permissible stress of the structural materials. In regard to the load and external force, a bearing capacity of the soil of 5 tons/m^2 for long-term stress and 10 tons/m^2 for short-term stress and a seismic force of equivalent to a seismic coefficient of Co= 0.1 are adopted. The wind load and the live load will be determined depending on the actual situation.

Outline of School Facilities

Site	Site Area	Approx. 627,000m^2 (including the area reclaimed by the silting sand
	Sports Ground	Approx. 12,000m^2 (football ground)
Structural Facts	Structure	Single-Story RC
	Structural Type	Rigid Frame
	Foundation	RC Mat Foundation
	Floor Area to be Added	354.375m^2 (ground floor) 86.062m^2 (corridor) Total: 440.437m^2
Building Area		5,431.65m^2 (5,462.65m^2)
Total Floor Area		7,485.86m^2 (7,516.86m^2)

Total Floor Area of Existing Buildings

Name of Building	No.of Stories	Structure	Floor Area (m^2)	Remarks
Main Building	2	RC	2,054.21	Built in 1980
Practical Training Building	1	"	789.88	"
Dormitory Building	2	"	2,054.21	"
Refectory	1	"	789.88	"
Boat House	1	"	182.25	"
Mechanical Equipment Building	1	"	295.00	"
Library Building	1	Brick	210.00	Built by School using local construction method
Clinic Building	1	Brick	150.00	"
Fire-Fighting Model Ship	1	RC	360.00	"
Garage	1	Brick	160.00	"
Guard Post x 2	1	"	16.00	"
Transformer Building	1	"	15.00	"
Total			7,076.43	

Floor Area to be Newly Provided

Workshop Training Building	1	RC	440.43	
Grand Total			7,516.86	

Finishing Materials

Main Exterior Finish

Roof	: Urethane water proof membrane + mortar topping + corrugated asbestos cement board
Walls	: Brick with mortar joints using steel trowel (part paint finish)
Doors and Windows	: Wooden frames, oil stained and boiled oil finish, clear glass or louvre windows. The opening part of the window will have an iron grid. Wooden louvres are used for fanlights with mosquito netting. Doors are wooden flush doors with 2 locks.
Corridor and Eaves	: Mortar joints using steel trowel
Conduit	: Vinyl pipes

Main Interior Finish

Corridor

Floor	: Precast terrazo (300 mm x 300 mm)
Walls	: Brick with mortar using steel trowel and paint finish
Ceiling	: Slab board (Beams) Mortar finish using steel trowel

Boiler Room

Floor	: Cement set bed finish using steel trowel
Walls	: Brick with mortar joints using steel trowel and paint finish
Ceiling	: (Beams) Mortar finish using steel trowel (Ceiling) Slab board

Automatic Control, Steering Training and Radar Monitoring Training Rooms and Lecture Room

Floor	: Precast terrazo (300 mm x 300 mm)
Walls	: Brick with mortar joints using steel trowel and paint finish. Part use of plywood with OS/CL finish.
Ceiling	: (Beams) Mortar finish using steel trowel (Ceiling) Plywood with OS/CL finish
Partitions	: Wooden stud with OS/CL finish. Fixed clear glass of 5 mm in thickness. The bottom panel is of plywood with OS/CL finish
Doors	: Wooden flush doors with locks and OS/CL finish

Connecting corridor : RC with urethane waterproof roof

3) Electric Facilities Plan

The main power will be supplied from the power room in the mechanical equipment building to the main distribution board to be installed inside the boiler room, which in turn will be located in the new training workshop. The power supply to those switchboards for the training equipment, lights and boat house will be made from this main distribution board.

Supply Voltage : 3 phases, 4 lines, 380 V/220 V, 50 Hz

Wiring System : (Interior) Vinyl insulated wire is laid inside the electricity piping system as in the case of the existing wiring system.

: (Exterior) Double insulated wire (such as CV) is laid inside the electric pipes protected by a jute cover.

Lighting : Illuminance ... 300 Lx or more for all rooms
Appliance ..... Generally fluorescent tube (FL-40W)
Outside Corridor ..... Illuminance is 50 Lx or more using a waterproof appliance

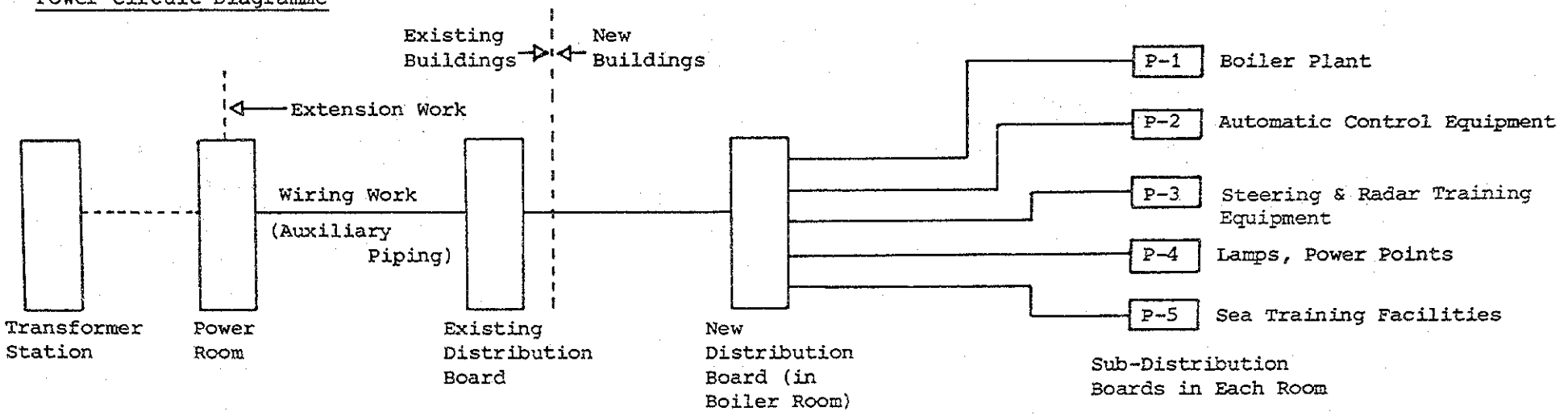
Power Points : For general use, 2-4 points are provided for each room.

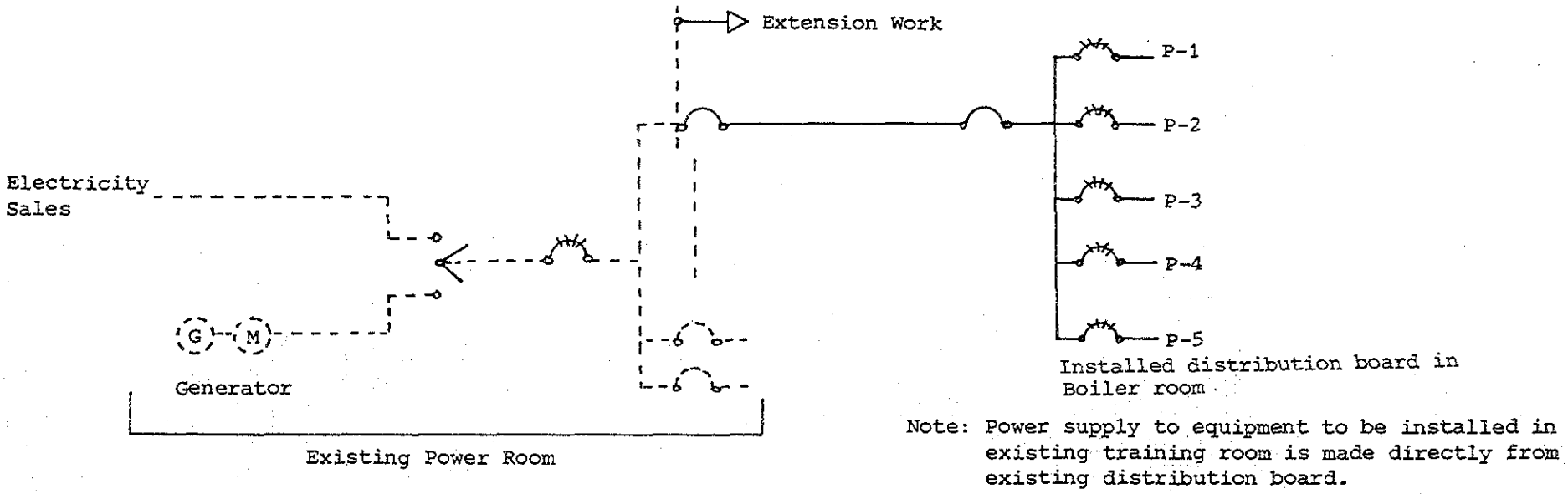
Capacity of Electric Facilities :

Boiler Plant	P-1	7 KVA
Automatic Control Equipment	P-2	22.1 KVA
Steering Training Equipment	P-3	
Radar Training Equipment		
Lamps	P-4	5.4 KVA
Sea Training Facilities	P-5	32 KVA
Equipment to be installed in existing training room		22.3 KVA
Total		88.8 KVA

The reduction rate of the voltage at the end use should be less than 4% of the original voltage from the power room.

Power Circuit Diagramme

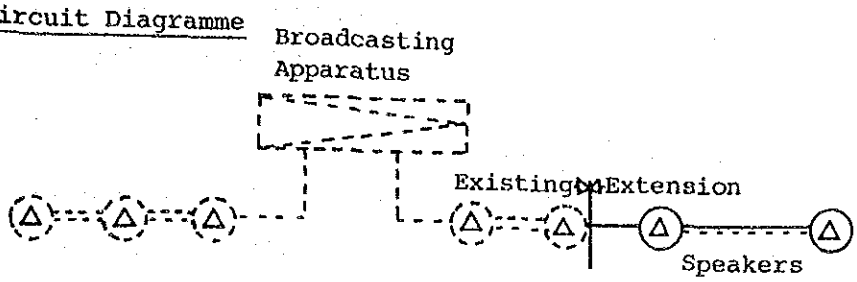




Note: Power supply to equipment to be installed in existing training room is made directly from existing distribution board.

Broadcasting Facilities : One or more speakers should be installed in each room and be connected to the existing wiring to use the existing broadcasting facilities. Vinyl insulated wire (1.2 mm) is laid inside the electricity pipes.

Circuit Diagramme



Interphone Facility : The existing lines (24 lines) appear to have no room for the additional interphone. New wiring is made and existing interphones which are not often used are removed for reinstallment in new positions.

Telephone : Only the piping work for the telephone line is conducted.

Alarm : An alarm is installed in the outside corridor. The specifications of the bell and alarm box are similar to the existing system. Wire with a similar specification to the existing wire is laid in the wire piping.

Circuit Diagramme---(B)—#(B)

Lightning Rod : A loop conductor is installed at the top part of the parapet and is earthed. 2 earthing terminals are set up and the size of the conducting wire is 50 mm^2 or more.

Ventilation Equipment : The boiler room air should be ventilated more than 20 times per hour. A supply ventilating fan is installed depending on the air supply to the boiler and the frequency of ventilation.

4) Dehumidifier System

A dehumidifier system will be introduced in the radar monitoring training room and in the trainer training room and dehumidifiers which satisfy the design conditions will be installed.

Design Conditions: Atmospheric Temperature 35°C
Humidity 90%
Interior Humidity 75%

5) Water Supply System

Of those newly constructed facilities by the Project, the boiler plant room requires a water supply system.

Maximum Water Use by Boiler: 0.2 m^3/hr

The new piping will be connected to the existing piping and extended to the water tank for the boiler. The specifications for the pipes and valves, etc. will be similar to those for the existing system.

6) Water Drainage Facility

Only the boiler plant room requires a water drainage facility. The drainage system will comprise a penetration tank with concrete drainage pipes.

Boiler Tank Capacity: 50 ℓ
Continuous Blower Water Supply Volume: 5%

4-1-3 Sea Training Facilities Plan

(1) Basic Plan

In the planning of sea training facilities, the method of construction decisively determines the quality of the buildings. The method should, therefore, be selected based on a thorough comparison of the various methods in terms of their characteristics (safety, durability, maintainability and adaptability to the environment and economy), as well as in terms of the natural conditions, usage, construction con-

ditions and construction cost. In particular, studies on such natural conditions as the topography, geology, weather, tide, waves, currents and silting sand, etc. should be conducted and the data so obtained analysed.

Cutter training, cutter landing and the training of boarding and unboarding cutters are indispensable parts of the curriculum for any rating school. Although these sea training facilities are necessary for the School, small-size facilities will suffice for the School's present requirements.

The fact that the groyne is becoming unusable due to the silting sand emphasises the relative dominance of natural conditions vis-a-vis the present scale of the groyne. In the present Basic Design, the cutter launching system and the training of boarding and unboarding are considered separately in view of establishing simple and durable facilities. In this way, the risk of all the facilities becoming unusable due to a single disaster is mitigated.

(2) Maritime Weather Conditions

The prevailing wind in the area is a north-west wind in the rainy season and, therefore, the wave direction is also north-west. The beach is shallow for some distance and the gradient of the seabed upto some 100 m from the shore is about 1/80 and 1/50 thereafter. The range of the tide is found to be 1.4 m in the field survey. Detailed data on the topography and geology of the seabed, tide, waves, currents and silting sand in front of the project site is unavailable.

While the MSL (Mean Sea Level) at Makassar Port is used as the standard sea level of the area, the LWL (Low Water Level) and the HWL (High Water Level) are estimated to be around MSL -0.7 m and MSL +0.7 m respectively.

The river mouth of the Djene Berang river is located some 4 km north of the project site and a large volume of sediment is discharged here in the rainy season. This sediment is transported from the north to the south by the current running along the coastline in the season when the prevailing wind is from the north-west. Based on the topographical and geological analyses, it can be assumed that the Baronbong area was formed by the accumulation of sediment. The coastal silting sand around the jetty of the groyne, which stretches at a right angle to the sea, continuously moves and is affected by the directions of the wind and waves which vary depending on the season. This phenomenon was studied in May and June, 1986 and is described in detail in the Preliminary Study Report.

(3) Jetty

The jetty used for the training of cutter landing and cutter boarding and unboarding has an artificial floor stretching from the sea wall and an apron supported by a structure of steel pipes, H beams, concrete piles or wood. While steel is subject to corrosion by salt, wood can be destroyed by bacteria. The introduction of a wooden jetty, however, is decided in view of the frequency of its use, durability, construction cost and maintainability. The ironwood produced on Kalimantan Island will be used. The width and length of the jetty will be 3.5 m and about 30 m respectively. It will consist of piles, beams, girders and floor plates and stainless hardware will be used for the connection of these components.

The following is a comparison of the permissible design stress of ironwood with that of other timbers (oak and Japanese cypress).

Permissible Stress \ Type		Ironwood	Oak	Japanese Cypress
Permissible Long-Term Stress (kg/cm^2)	(Fibre Direction) Compressive Strength	130	90	70
	Tensile or Flexural Strength	150	130	90
	Sheer Strength	20	14	7
Young Coefficient (kg/cm^2)		$12.5x40^4$	$12.4x10^4$	$10.38x10^4$
Specific Gravity		1.04	0.87	0.41

(4) Paving Plan

The launching and lifting of a cutter is carried out using a bogie and the cutter is transported to and from the boat house using a 5 ton winch. An asphalt paved road will be constructed for the easy transport of the bogie. A slope section of some 18 m from the shore with a 0.9 m difference in height will be paved with concrete and the remaining some 80 m to the boat house will be paved with asphalt. The road will be 6 m wide and will be constructed along the existing pier of the groyne. Concrete edge stones will be laid to separate the road from the ground, the section below the surface being at least 600 mm. The foundation of the road should be levelled and well compacted.

4-2 Examination of Design Conditions

4-2-1 Equipment Design

(1) Main Power

AC 380 V 3 phases 50 Hz

AC 220 V Single phase 50 Hz

(2) Temperature and Humidity Conditions

A dehumidifier system will be introduced in the steering training room and the radar training room on the basis of the following conditions.

Atmospheric Temperature: 35°C

Humidity: 90%

(3) Equipment Distribution

The equipment will be distributed in such a way as to allow adequate space for student training with stress on its relevance to neighbouring equipment.

4-2-2 Facilities Design

(1) Site Conditions

The Ujung Pandang Rating School is situated in the city of Ujung Pandang, the capital of South Sulawesi Province, which in turn located at the south end of Sulawesi Island, facing Makassar Strait. (An area of 175.77 km^2 at latitude 5°8's and longitude 119°26'E with a population of approximately 750,000.)

The School is some 9 km to the south of the city centre. To reach the School, however, it is necessary to travel some 20 km south by major road and then some 7 km west by branch road. The entire section of road between the city centre and the School is asphalt paved. Although the Baronbong district currently consists of agricultural and coastal fishing villages, the area to the south of the city, including the Baronbong district is planned to become a recreational area according the city's urban planning. The School's campus is

an irregular rectangular shape of about 450 m in the east-west direction and about 130 m in the north-south direction. Reclamation along the coast is progressing due to silting sand.

The only access to the School from the city is by road which takes approximately 45 minutes. A privately owned minibus with a passenger capacity of 6-7 provides transportation from the area to the city.

(2) Weather Conditions

The area is tropical and has a mean temperature of 26°- 27°C throughout the year. The daily temperature rises to around 33°C and the humidity is 80 - 90%. The annual rainfall is approximately 3,000 mm and there are 150 - 200 days of rain per year. The most rainfall is recorded in the rainy season which lasts from November to March. In general, the largest monthly rainfall of some 700 mm is recorded in December or January.

The annual wind pattern is regular. An easterly or south-easterly wind prevails in the dry season while a westerly or north-westerly wind prevails in the rainy season. The strongest wind is generally from the north-west in January with a velocity occasionally reaching 15 m/sec. The average wind velocity, however, is as gentle as 1 - 2 m/sec and the strongest velocity during the dry season is around 7 m/sec.

Temperature

Mean Daily Temp.	Little change throughout the year	25.7°- 26.8°C
Highest Temp.	High in Sept. and Oct.	30.0°- 34.0°C
	Other Months	29.0°- 33.0°C
Lowest Temp.		21.0°- 24.0°C

Humidity

Mean Monthly Humidity	Lowest in Aug.	Around 74%
	Highest in Jan. - Mar.	88 - 90%

Rainfall

Mean Annual Rainfall		Around 3,000 mm
highest Monthly Rainfall		800 mm

The highest monthly rainfall recorded since 1962 was 1,155 mm in February, 1977.

Rainy Days	Rainy Season (Dec. - Mar.)	19 - 25 days
	Intermediate Season (Nov., Apr., May)	12 - 20 days
	Dry Season (Jun. - Sept.)	0 - 10 days

Wind

Mean Velocity/Direction	1-2 knots south-east and north-west
Maximum Velocity/Direction	7-10 knots west - north-west

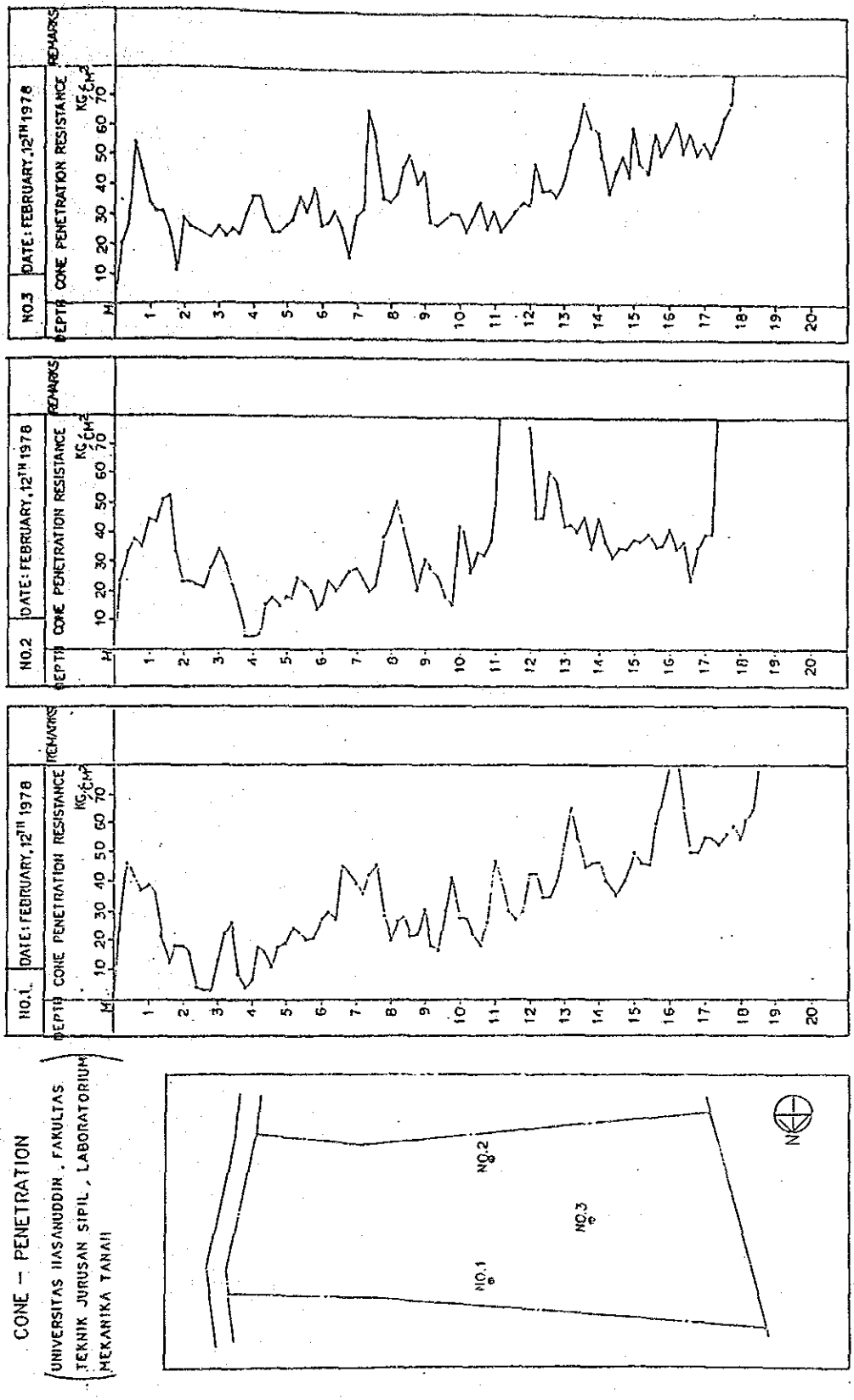
(Based on data between 1983 and 1985)

(3) Geology

The topography of the site is generally flat, facing the coast and with shallow water stretching far in to the sea. The distribution of the geological strata is assumed to be uniform in the site area, possibly formed by the accumulation of sediment from the Djene Berang River.

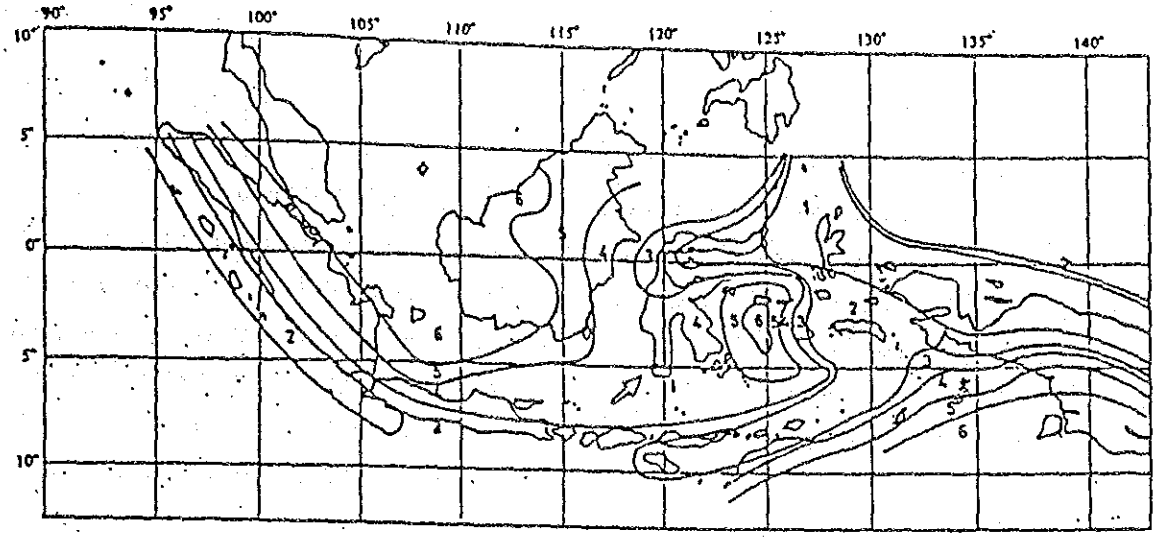
According to the Basic Design Study, the ground at 0.8 - 1.0 m below the surface is wet and has a high groundwater level. Vertical drilling can be easily conducted to a depth of some 1.45 - 1.65 m where the ground consists of black/grey sand granules. The geological survey in the Baronbong area shows the stratification of the ground to be firmish sandy soil (at a depth of 2-3 m), softish sandy soil (at a depth of 7-8 m), soft clayey soil (at a depth of 11-12 m), firm sandy soil (at a depth of 15 m), clay (at a depth of 17 m) and very firm sandy soil (at around 17-18 m from the surface). The following figure shows the results of the soil load test using the

time of the School's construction in 1980.

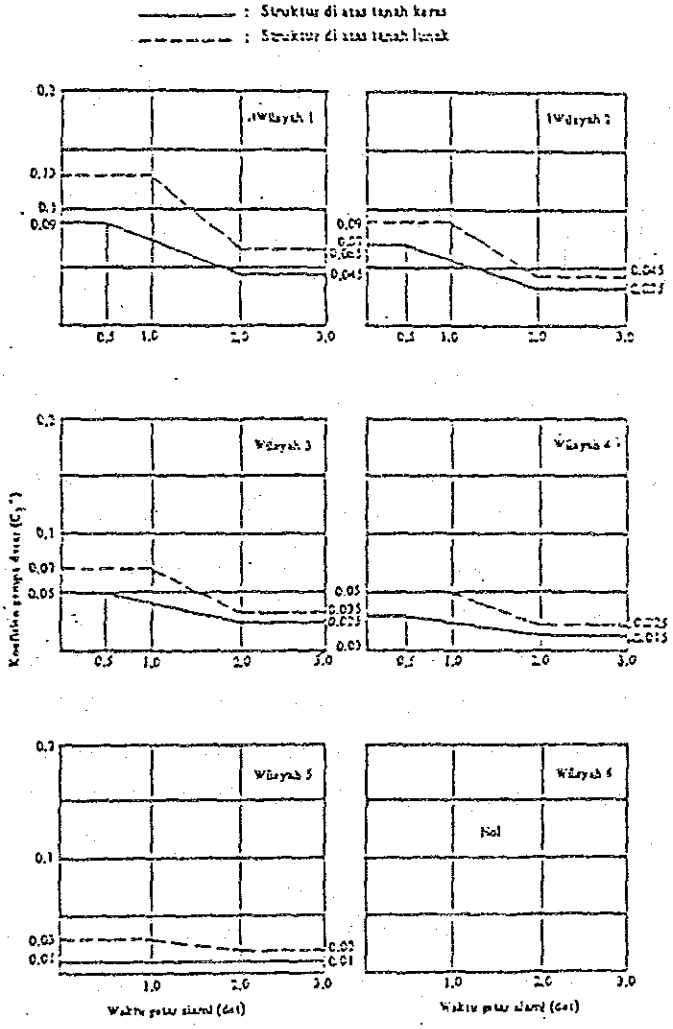


(4) Earthquakes

The Indonesian islands belong to a part of the world where seismic activity is relatively strong. According to the area map designating the earthquake loads for construction work issued as the Construction Regulations by the Indonesian Government, south Sulawesi is designated as a medium intensity area in terms of seismic activity. The Basic Design Study Report in 1978 classifies Ujung Pandang as an area where the earthquakes ground shocks are of the lowest intensity, i.e. under 0.01 G (G denotes the acceleration of gravity).



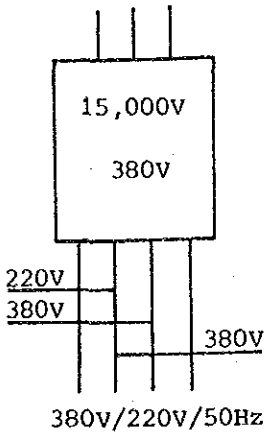
Gambar4.3 Wilayah-wilayah gempa untuk Indonesia



Gambar 4.4 Koefisien Gempa dasar

(5) Electricity Facilities

Since the Electricity Corporation did not provide an electricity supply in the Baronbong district at the time of the School's opening, an independent power plant was installed at the School to provide the School with electricity. The power transmission line was, however, extended in December, 1984. A transformer substation is currently located at the School and a monthly capacity of 196 KVA has been agreed upon with the Electricity Corporation (PLN).



Primary: 3 phases 3 lines 15,000V 50Hz

Secondary: 3 phases 4 lines 380V/220V 50Hz

While 110 V, 127 V and 220 V are currently used in the city, uniform usage of 220 V is planned in the future. The PLN is calling for electricity saving despite an adequate supply capacity due to the construction of an additional power plant. Communications on the campus are made either by interphone or radio. A telephone cable has been laid but is not yet in use. With increasing urbanisation in the future, however, the telephone facilities will be expanded and put into use.

(6) Water Supply and Drainage Facilities

The School is not provided with a municipal water supply although the National Waterworks Corporation (PAM) is responsible for the provision of water supply facilities. The original water supply plan, therefore, adopted a central water supply system where water from a deep well was supplied via the storage tank and the elevated tank. Unfortunately, however, the deep well pump accidentally fell into the well during the construction work and, therefore, the system has never been used. At present, several shallow wells with a depth of 4 - 5 m are located on the campus and the water from the storage tank is supplied to the kitchen and toilets by the home-use pressure pump. When an extra supply of water is required, additional wells will be dug wherever it is deemed appropriate. The water amount varies from the dry season to the rainy season as the groundwater consists of rain-water and discharged water. The water in use is under the supervision of the Health Centre but the water quality cannot be said to be very good. The water discharged from the sewage treatment facility, miscellaneous discharged water and rain-water is drained to the rain-water reservoir from where it permeates into the ground for natural treatment. As the water supply is inadequate, as described above, the toilet fixtures are currently being replaced by traditional Indonesian-type fixtures using Government financing.

(7) Other Facilities and Equipment

With regard to the fire-fighting facilities, although indoor fireplugs and a fire pump are provided, they cannot be used at present due to the water shortage, which in turn is caused by the absence of the originally planned central water supply system.

Window-type air conditioning facilities are provided in the director room, meeting room, chief administrator's room, clinic and the Japanese specialists' room. Despite their being in operation all year round, none of them have yet

shown any major trouble.

As the School is located on the coast, the degree of damage by salt to these electrical appliances, including lamps and switches, and construction materials is generally more severe than in the case of buildings in an urban area.

4-3 Basic Design

4-3-1 Equipment Design

The basic design of the equipment size, specifications and quantity is determined based on the consideration of the School's request, the balance with the existing equipment, maintainability and economy.

A list of the planned equipment is given below, followed by an outline of specification for each item of equipment. With regard to spare parts, manufacturers' standards are applied.

(1) List of Equipment

No.	Item	Description	Quantity
I.	NAVIGATION AID EQUIPMENT		
1.	Steering Trainer	Composed of steering stand, steering gear, instructor's console, indicator panel, etc.	1 set
2.	Gyro Compass		1 set
3.	Radar Observation Trainer	Composed of control console, radar display, instructor's console, x-y plotter, printer, etc.	1 set
4.	Engine telegraph	Electric type	1 set
	(1) Transmitter	stand type	
	(2) Receiver	wall mounting type	
	(3) Gong		
5.	Other Equipment		
	(1) Radar plotting board		2 sets
	(2) Lamp for chart table		10 sets
	(3) Sextant		15 sets
	(4) Stop watch		5 sets
	(5) Chronometer		2 sets
II.	SURVIVAL TRAINING EQUIPMENT		
1.	Inflatable life raft	A-type for 6 persons	1 set
		A-type for 10 persons	1 set
2.	Life saving signal flare		
	(1) Signal red flame		5 doz
	(2) Parachute flare signal		5 doz
	(3) Rocket signal		3 doz
	(4) Floating smoke signal		20 pcs
	(5) Self-ignition light		5 pcs
	(6) Line-throwing appliance		1 set
3.	Cutter	F.R.P Full-rigged 9 m length for 12 persons	3 sets
4.	Skin Diving Set		
	(1) Wet suit		2 sets
	(2) Breathing apparatus		2 sets
	(3) Mask		2 sets
	(4) Fin		2 pairs
	(5) Air compressor	App. 4 m^3/H, 220 V x 1 x 3.7 KW x 50 Hz	1 set
III.	FIRE FIGHTING EQUIPMENT		
1.	Fire Fighting Apparatus		
	(1) Portable fire pump	Engine driven, App. 40 m^3/h	1 set
	(2) Breathing apparatus	Self-contained compressed air type with demand valve	12 sets
	(3) Fire Hose	1.5 inch x 20 m, canvas	10 pcs
	(4) Fire Hose	2.5 inch x 20 m, canvas	2 pcs

No.	Item	Description	Quantity
(5)	Fire Hose	1.5 inch x 20m, coated canvas	10 sets
(6)	Fire Hose	2.5 inch x 20m coated canvas	2 sets
(7)	Nozzle	For 1.5 inch, flush & spray	4 sets
(8)	Nozzle	For 2.5 inch, flush & spray	4 sets
(9)	HALON type extinguisher system	Picture of extinguishing system	1 set
(10)	Fire alarm system	composed of Control panel, detector, bell, etc.	1 set
IV.	DECK DEPARTMENT EQUIPMENT		
1.	Launching Apparatus	Electric motor driven winch to pull a bogie	1 set
2.	Ship Chandlery		
(1)	Rope	24 mm x 200 mm	5 coils
(2)	Wire rope	24 mm x 200 mm	1 coil
(3)	Canvas	No. 2 - 6 (50 m/roll)	1 each
(4)	Signal light	Lever type with 20 m cable	2 sets
V.	ENGINE DEPARTMENT EQUIPMENT		
1.	Forging Facilities		
(1)	Furnace and blower		1 set
(2)	Anvil		10 pcs
(3)	Swage block		10 pcs
(4)	Blacksmith's forging tool	Round type (MARUBO KIRI) 9, 13, 19, 25 mm	10 each
(5)	"	Flat type 36, 48 mm	20 each
(6)	"	Round type (MIZOHESHI) 9, 13, 19, 25 mm	10 each
(7)	"	Round type (MARUHESHI) 9, 13, 19, 25 mm	10 each
(8)	"	Square type, 50, 63, 75 mm	10 each
(9)	Blacksmith's hammer	Double face 10 kg	5 pcs
(10)	"	" 5 kg	10 pcs
(11)	"	" 2 kg	20 pcs
(12)	Blacksmith's tongs	Flat type	20 pcs
(13)	"	Round type	20 pcs
(14)	"	Stork type	20 pcs
(15)	"	Taper bend type	20 pcs

No.	Item	Description	Quantity
2.	Machine Tools		
(1)	Lathe	Center distance app. 600 mm	3 sets
(2)	Universal machine	Center distance app. 1,000 mm	1 set
(3)	Gas welding set		1 set
(4)	Arc welding set	Engine driven	1 set
3.	Boiler Plant	Composed of package boiler, water softener, tanks, etc.	1 set
4.	Ship's Engine Room Model		
(1)	Diesel plant	Model	1 set
(2)	Steam turbine plant	Wall Chart	1 set
5.	Automatic control Equipment		
(1)	Temperature control apparatus		1 set
(2)	Flow control apparatus		1 set
(3)	Level control apparatus		1 set
(4)	Electronic control apparatus		1 set
(5)	Hydraulic control system		1 set
(6)	M/E remote control system		1 set
(7)	Control valve cross sec. model	Model and wall chart	1 set
6.	Electric Training Facilities		
(1)	Multi purpose circuit training apparatus		8 sets
(2)	Electronic circuit training apparatus		4 sets
7.	Engine indicator	M2 Type	1 set
		M3 Type	3 sets
8.	Drafting Equipment	Drafting board, triangular scale, compass set, T-type rule etc.	25 each
9.	Transceiver	For school communication and communication training	6 sets
VI.	Audio-Visual Teaching Aids		
(1)	Video cassette recorder	VHS system	1 set
(2)	Monitor TV	26"	3 sets
(3)	Portable video camera	VHS system	1 set
(4)	Overhead projector		1 set
(5)	Screen for OHP		1 set
(6)	Video tape	Educational video tapes	64 sets

No.	Item	Description	Quantity
VIII.	SCHOOL BUS		
	(1) Bus	For 40 persons	1
	(2) Bus	For 24 persons	2
	(3) Mini Bus	For 8 ∿ 10 persons	1
VIII.	OTHERS	Reference books	

(2) Basic Equipment Design

1) Navigation Aid Equipment

a Steering Trainer - 1 set

Maintaining the ship's course by operating the handle at the steering stand while checking the indicator panel and the pictures projected on the screen gives the student an actual feeling of steering. The steering gear with the model rudder can be operated by a handle in order that its mechanism can be easily understood.

The student's steering is monitored by the instructor who checks the indicators, display panel and repeater, etc. on his own console. The instructor gives the student various conditions to deal with for extensive training. The results of the student's steering can be recorded for evaluation later.

The entire system is installed in the steering training room in the new training workshop and consists of the following equipment. Refer to the equipment distribution chart for the training workshop for the distribution of these items.

Steering Stand ..... 1 set
Autopilot Type
Steering Gear ..... 1 set
Electro-Hydraulic Type
Capacity: 1.5 t.m
Composed of a hydraulic unit, valve unit, helm assembly hand pump, starter and model rudder.
Instructor's Console ..... 1 set
Incorporating a speed meter, helm indicator, repeater, display unit, monitoring panel and condition selection switches, etc.
Indicator Panel ..... 1 set
Incorporating an anemoscope, speed meter, helm indicator, indication lamps, turning rate and dimmer switch, etc.
Overhead Projector ..... 1 set
Screen ..... 1 set

Printer ..... 1 set
Recorder ..... 1 set
Records course and helm.

b Gyro Compass - 1 set

The large gyro compass is connected to the repeater and has a transparent case in order that the internal structure can be seen. The repeater is incorporated to the existing stand and is installed in the steering training room in the new training workshop. Since the current repeater stand is used, a gyro compass and repeater matching the size of the stand are selected.

Gyro Compass ..... 1 set
Repeater Compass ..... 1 set

c Radar Observation Trainer - 1 set

This equipment teaches the student the basic radar navigation method, how to judge the distance from other ships and how to prevent a collision by showing the student's own ship, 20 other ships and the coastline on the display unit. The student operates the control console while watching the radar display to learn how to use the radar navigator and how to avoid a collision.

The instructor can supervise the student from his own console, giving different conditions to be dealt with and also controlling the course recorder and printer. The results of the training recorded by the course recorder can be printed out for evaluation of the student's progress later.

The trainer is installed in the radar training room in the new training workshop and consists of the following equipment. Refer to the attached equipment distribution chart for the distribution of these items.

Control Console ..... 1 set
The ship's speed and course can be controlled by the engine speed control and the steering operation. The following are also displayed: repeater, helm, speed, number of propeller revolutions, turning rate and clock.
Radar Display (16") ..... 1 set
Instructor's Console ..... 1 set
This has various monitoring functions and can be used to set different operation conditions.
X-Y Plotter ..... 1 set
Can plot the courses of the ship, other ships and the coastline.
Printer ..... 1 set
System Cabinet ..... 1 set

d Engine Telegraph - 1 set

The transmitter, receiver and gong are installed in the new training workshop. The engine telegraph consists of the following equipment. Refer to the attached equipment distribution chart for the distribution of these items.

Stand Type Transmitter (for Bridge) ..... 1 set
Wall Mounted Type Receiver (for Engine Room) .. 1 set
Gong ..... 1 set

e Other Equipment

Radar Plotting Boards ..... 2 sets
Chart Table Lamps ..... 10 sets
Sextants ..... 15 sets
Stop Watches ..... 5 sets
Chronometers ..... 2 sets

2) Survival Training Equipment

a Inflatable Life Rafts

6-Seater ..... 1 set
10-Seater ..... 1 set
Equipped with legally required items, a container and stand.

b Life-Saving Signal Flares

Single Red Flame ..... 5 doz.
Luminous Intensity: not less than 15,000 cd Illumination Duration: not less than 1 minute

Parachute Flare Signals ..... 5 doz.
Parachute Opening Height: not less than 300 m
Luminous Intensity: not less than 40,000 cd on average
Illumination Duration: not less than 40 seconds
Rocket Signal ..... 3 doz.
Discharge Height: not less than 250 m
Luminous Intensity: not less than 70,000 cd on average
Floating Smoke Signals 20
Smoke Generation Duration: not less than 3 minutes
Self-Ignition Lights 5
Illumination Duration: not less than 2 hours
Luminous Intensity: not less than 2 cd in all directions
Battery: 1.5 V x 6
Line-Throwing Appliance 1
Throwing Range: not less than 260 m in horizontal direction
Life-Saving Line: 4 mmϕ x 320 m

c Cutters (made of FRP) 1
Length: 9 m
Width: 2.43 m
Depth: 0.83 m
Seating Capacity: 12
Fittings: ores, boat hooks, fender, ropes, sailing gear and life jackets
Spare Parts: bottom plugs (2)

d Skin Diving Equipment
Wet Suits (S and M sizes) ..... 1 each
Breathing Apparatus 2
Equipped with 10 ℓ tank, regulator and pressure meter.
Masks 2
Fins ..... 2 pairs
Air Compressor 1
Capacity: 4 m^3/h, 220 V x 3.7 KW with starter. This air compressor is also used for the breathing apparatus for the fire-fighting equipment described later.

3) Fire-Fighting Equipment

a Portable Fire Pump 1
Engine driven using gasoline and equipped with a 5 m suction hose, suction strainer, couplings (Nakajima type) for 1.5" and 2.5" fire hoses.
Pump Capacity: approximately 40 m^3/h, 5.5 kg/cm^2

b Breathing Apparatus 12
Demand type breathing apparatus.
Compressed Air Cylinder: 4 ℓ x 1
Manufacturer and model correspond to the existing breathing apparatus.

c Fire Hoses
Canvas Hoses
1.5"ϕ x 20 m 10
2.5"ϕ x 20 m 2
Coated Canvas Hoses
1.5"ϕ x 20 m 10
2.5"ϕ x 20 m 2
All hoses have couplings corresponding to the existing equipment. The connection between hoses uses the insertion method and the connections at the pump outlet and nozzles are of the Nakajima type.

d Nozzles
The nozzle model corresponds to that of the existing nozzles.
1.5"ϕ, flush and spray type 4
2.5"ϕ, flush and spray type 4

e Halon Type Extinguisher System - 1
Wall chart illustrating the Halon type extinguisher system and halon.

f Fire Alarm System - 1
An ion smoke detector, optical smoke detector, thermal detector, control panel, alarm box and alarm bell are wired to constitute a single system which is installed in the new training workshop.
Control Panel 1
Wall mounted type with 3 lines.
Ion Smoke Detector 1
Optical Smoke Detector 1
Thermal Detector 1
Alarm Box 1
Alarm Bell 1
Spare Parts: 5 elements for each type of detector.

4) Deck Department Equipment

a Cutter Launching Apparatus
System Operation - Place the bow of the cutter at the tilted board of the bogie. Lift the entire cutter using the hand winch. Replace the tilted board of the bogie in the horizontal position using the manual jack. Finally, pull the bogie to the boat house using the electric winch located near the boat house. See attached paper 2 for the illustration.

Bogie 1
Equipped with hand winch manual jack, tilting board (with rollers), sheave and 4 tyres.
Electric Winch 1
Capacity: 5 t x 15 m/min.
Equipped with sheave and wire rope.

b Ship Chandlery
Rope (Cremona rope) ..... 5 coils
Size: 24 mmϕ x 200 m/coil
Wire Rope ..... 1 coil
Size: 24 mmϕ x 200 m/coil
Canvas (1 of each size) 5
Size: Nos. 2-6 900 mm (W) x 50 m (L)
Signal Lights (lever type) 2
Capacity: 60 W equipped with 220 V/24 V transformer, 20 m cable and storage case.

5) Engine Department Equipment

a Forging Facilities

These are installed in the existing engine department training room.

Furnace (with blower) 1
Anvils 10
35 kg, 95 mm (W) x 400 mm (L) x 210 mm (H)
Swage Blocks 10
300 mm (W) x 300 mm (L) x 98 mm(H)
Blacksmith Forging Tools
Round Tups (Marubo Kiri)
9 mm, 13 mm, 19 mm, 25 mm ..... 10 each

Flat Tups
36 mm, 48 mm ..... 20 each

Round Tups (Mizoheshi)
9 mm, 13 mm, 19 mm, 25 mm ..... 10 each

Round Tups (Maruheshi)
9 mm, 13 mm, 19 mm, 25 mm ..... 10 each

Square Tups
50 mm, 63 mm, 75 mm ..... 10 each
Blacksmith Hammers
Double Face, 10 kg 5
Double Face, 5 kg 10
Double Face, 2 kg 20
Blacksmith Tongs
Flat Tongs (450 mm long) 20
Round Tongs (450 mm long) 20
Stork Tongs (450 mm long) 20
Taper Bend Tongs (450 mm long) 20

b Machine Tools

Lathes 3
Centre Distance: 550 mm
Tooling Distance on Bed: 360 mm
Motor: 3.7 KW

Universal Machine 1
Centre Distance: 1,000 mm
Tooling Distance on Bed: 420 mm

Drilling Diameter: 38 mm (maximum)
Cutter Shaft Diameter: 25.4 mm

Gas Welding Set 1
Comprising oxygen cylinder, acetylense cylinder, hose, cutter, welder, nozzle, regulator, goggles, lighter and cart.

Arc Welding Set 1
Portable engine driven arc welding apparatus (170 A).
Accessories: cable, mask, gloves, holder, wire brush, earth clamp and chipping hammer.

c Boiler Plant

See attached paper 1 for the illustration of the system.

Package Boiler 1
Generated Steam Volume: 200 kg/h x 7 kg/cm^2
Fuel: light oil
Fuel injection pump, draft fan, water supply pump, combustion unit and control panel are integrated.

Chemical Injection Pump 1
Diaphragm type, 25 cc/min x 5.5 kg/cm^2

Cascade Tank 1
Capacity: 0.6 m^3/hr

Water Softener 1

Feed Water Booster Pump 1
Capacity: 5.4 m^3/hr x 0.5 kg/cm^2

Fresh Water Generator 1
Capacity: 3 t/d, steam injection type

Ejection Pump 1
Capacity: 10 m^3/hr x 48 m x 3.7 KW

Cooling Water Pump 1
Capacity: 10 m^3/hr x 15 m x 1.5 KW

Fresh Water Pump 1
Capacity: 1.5 m^3/hr x 30 m

Cooling Water Storage Tank 1
Capacity: 3m^3

Distilled Water Tank 1

Capacity: 3 m^3

Fuel Tank 1

Capacity: 1 m^3

Drain Cooler 1

Cooling Tower 1

d Model of Ship's Engine Room

Diesel Plant 1

An engine room model with a scale of 1:10 for a 3,000 ton class ship is provided. Models of the main equipment are also installed with separately coloured pipes for easy recognition.

Steam Turbine Plant 1

A wall chart of approximately 1.5 m x 2 m in size.

Automatic Control Equipment

Temperature Control System 1

Portable testing apparatus enabling control of set temperature by changing the mixing ratio of high and low temperature water. Should be possible to use the proportional, differential, integral and feed-back control methods. The system consists of the following: electric heater, controller, pump, recorder, control valve, water tank and control panel, etc.

Flow Control System 1

Testing apparatus enabling control of set flow through the valve. Should be possible to use the proportional, differential, integral and feed-back control methods. The system consists of the following: pump, control valve, flow meter, water tank, controller, recorder and control console, etc.

Level Control System 1

Testing apparatus enabling control of set fluid level through the valve. Should be possible to use the proportional, differential, integral and feed-back control methods. The system consists of the following: pump, control valve, controller, water tank, recorder, level gauge and control console, etc.

Electronic Control System 1

- Sequential control Training Unit (box type with integrated panel)
  control panel (1 box) and load panel (2 boxes)
- Logical Circuit Training Unit
  circuit panel (5) with storage cases
- Logical Function Circuit Training Unit
  circuit panel (5) with storage cases

Hydraulic Control System 1

Panel type training apparatus with integrated hydraulic pump, hydraulic motor, control valve,

pressure gauge, pressure reducing valve and hydraulic hose.

Main Engine Remote Control System 1
Composed of engine room and bridge consoles.

- Engine Room Console
  Composed of main engine revolution indicator, headway or sternway handle, steering handle, various pressure gauges (cooling water, fuel, lubricating oil and air), indication lamps, changeover switch, and interphone, etc.

- Bridge Console
  Composed of main engine revolution indicator, steering dial, changeover switch, indication lamps, and interphone,
  etc.

Model Control Valve
Cross-section model of electro-magnetic valve ... 1
Cross-section model of hydraulic cylinder 1

Both are wall charts illustrating the cross-sections of a 2-way diaphragm valve, 3-way diaphragm valve, butterfly valve, single sheet valve and a double sheet valve.

f Electric Circuit Training Equipment

Multi-Purpose Circuit Apparatus
- Basic electric and electronic circuit training apparatus 4
  circuit panel, storage case and measuring instrument
- Transistor type power circuit training apparatus 4
  circuit panel, storage case and measuring instrument

Electronic Circuit Apparatus
Semi-conductor stability testing circuit 4

g Engine Indicators
M2 Type: 1
M3 Type: 3

h Drafting Equipment ..... 25 sets
Drafting Board
Triangular Scale
French Curve Ruler
Free Curve Ruler
Compass and Divider Set
Circle Ruler
Alphabet Ruler
T-Type Ruler
Triangle Ruler

i Transceivers 6
Portable type equipped with antenna, battery and charger.
Output: 5 W

6) Audio-Visual Equipment

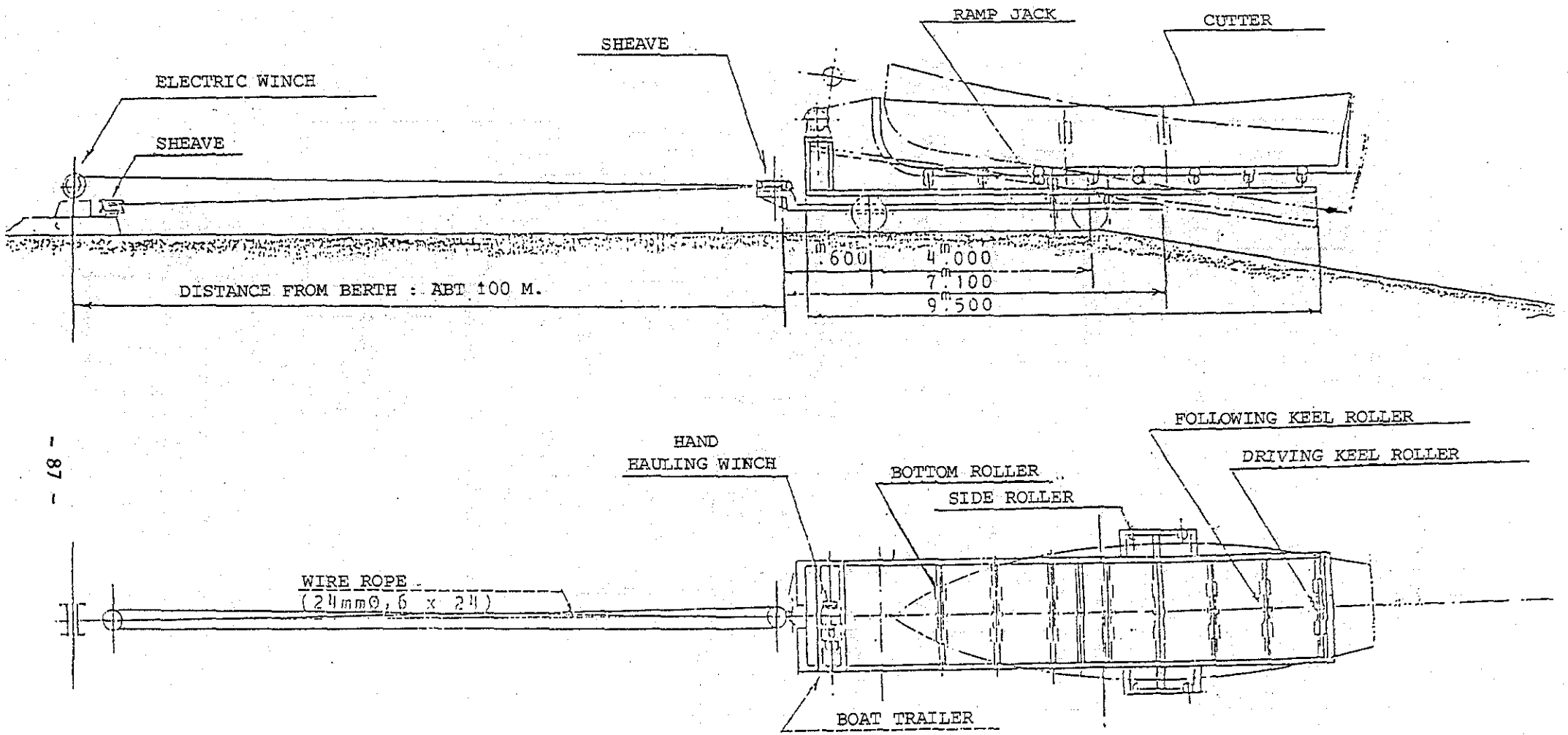
a Video Cassete Recorder 1
VHS System
b Monitor TVs 3
26"
c Portable Video Camera 1
VHS System, Auto-Focus
d Overhead Projector 1
Portable Type
e Screen for Overhead Projector 1
1,800 mm x 1,800 mm
f Video Tapes 64

7) School Buses

a Bus 1
40 seater, manufacturers standard type.
b Buses 2
24 seater, manufacturers standard type.
c Minibus 1
8-10 seater, high roof type.

8) Others

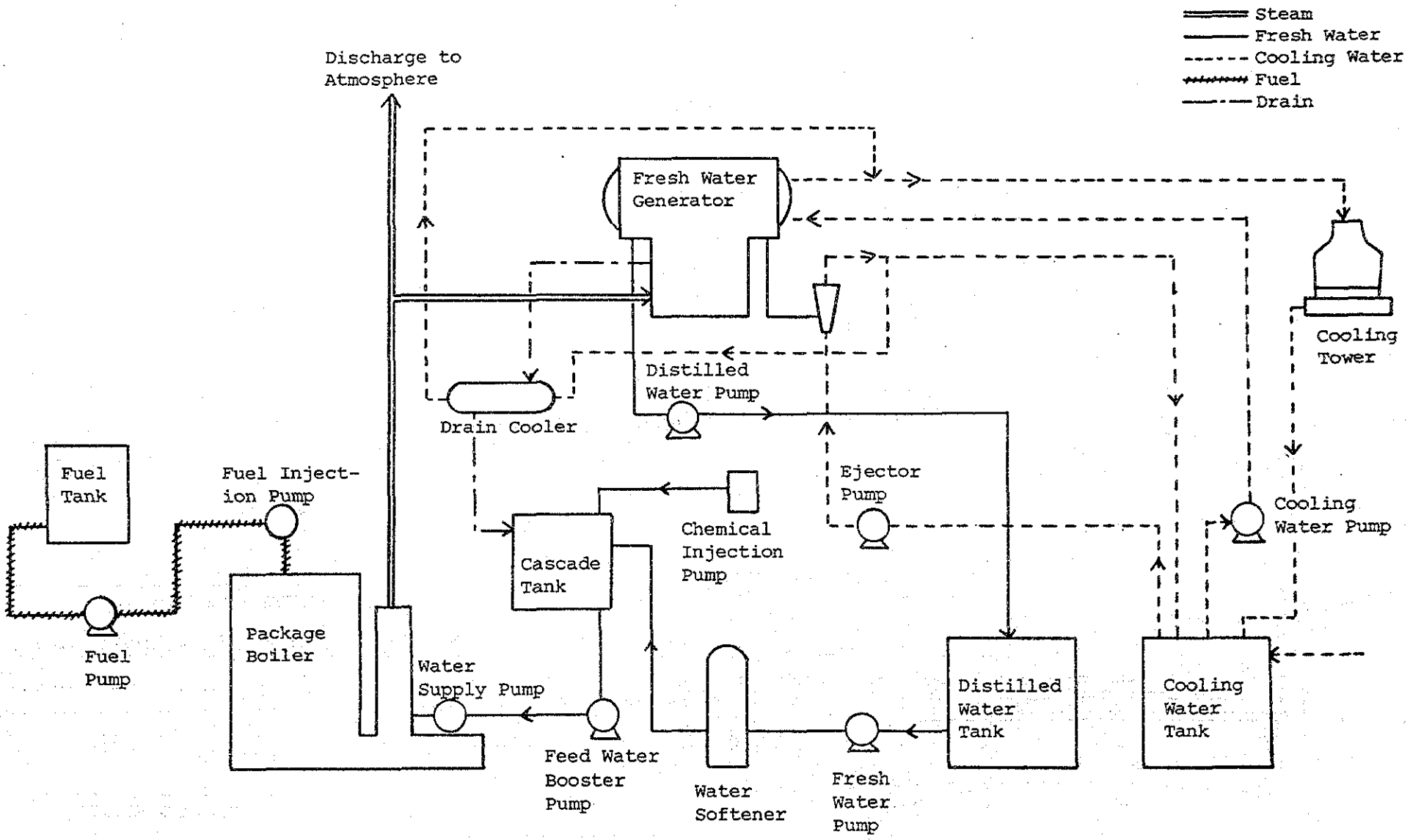
Reference Books



GENERAL VIER OF CUTTER LAUNCHING SYSTEM

Attached Paper - 1

Illustration of Boiler Plant System



4-3-2 Facilities Design

(1) Training Workshop

The introduction of new training equipment for the School necessitates the construction of a new training workshop. The appropriate size of each training room housed in this workshop is determined by taking into consideration the quantity and types of equipment to be installed while also allowing adequate space for a class of 25 students. In addition, the requirements of the international standards specified in the STCW Convention are referred to and the relevant facilities of other rating schools in Indonesia are examined and a comparison is made.

Although the existing buildings are classified into 3 groups in terms of their functions, i.e. administrative function, lecture and training functions and student living function, they are systematically combined. The location of the new training workshop is, therefore, designed to belong to the lecture and training function group in order that the harmonious distribution of the School's buildings can be maintained.

(2) Jetty

It has been decided to construct a wooden jetty to be used in the training of cutter landing, embarkation and disembarkation. The sea area adjacent to the School campus consists of a vast, sandy beach which is shallow for a great distance to the sea. Although sand drifting is generally witnessed on any coast, the Djene Berang river to the north of the campus discharges a huge amount of sediment during the rainy season, thus supplying fresh silting sand. As a result, the sand siltration phenomenon is particularly conspicuous in the area due to the interaction of the seabed, topography, tide, wind, waves and currents, etc. Any structure to be constructed in such an area should be easy to construct, extremely durable and economical. In view of these requirements, the ironwood

produced on Kalimantan Island which is particularly hard will be used as the construction material.

(3) Cutter Passage (Paving)

The boat house is located some 90 m from the shore with a 90 cm difference in the level at the time of the MLWL. In view of using a bogie to transport the cutters from the boat house to the shore and vice-versa, a total weight of 3.5 t (including cutter weight of some 1.6 t) has to be pushed manually and, therefore, it is decided to pave the road used by the bogie for a length of some 90 m and a width of 6 m with asphalt in view of its easy construction and maintenance.

4-4 Construction Plan

4-4-1 Construction Conditions and Policy

Ujung Pandang, the capital of South Sulawesi Province, is located in the southern part of the south-west peninsula of Sulawesi Island and is a port city with a long history of prosperity. It has a mean annual temperature of 27°C and the highest and lowest temperatures are 34°C and 21°C respectively. The dry season is from April to October and the rainy season is from November to March. The annual rainfall is approximately 3,000 mm and the humidity is generally high at 75 - 90%, showing tropical characteristics. While the wind direction changes in the dry and rainy seasons, the wind is generally gentle throughout the year.

With regard to the traditional Indonesian method of construction, wooden houses with an elevated floor are particularly noticeable in agricultural villages. This method allows good ventilation and appears to be the basic method for constructing houses which are suited to the local conditions. Urban houses are often constructed using sun-dried bricks or are 2-story buildings with a wooden truss structure and generally accompanied by a sloping tile roof. Buildings with brick walls, flat roof and pillars, beams and floors made of RC are also frequently seen in the city centre. Large porches with roofs or large eaves to prevent

direct sunlight, high ceilings to reduce changes in the room temperature and ventilation windows to prevent increases in the room temperature are common to avoid the effects of the strong solar radiation from both the north and south. In short, the design requirements for the creation of a comfortable living environment relate to those measures dealing with heat, rain and ventilation.

With regard to the technological level of construction, no problems are seen in Jakarta where modern building technologies have been adopted, however it must be taken into consideration in the design of the present Project that the traditional method meets the construction requirements in Ujung Pandang where there is no demand for high buildings which necessitate the application of advanced technologies.

Generally speaking, the level of the construction technology affects the length of the construction period and the construction management. The use of building materials and a construction method to which local workers are accustomed is, therefore, recommended in order to avoid confusion arising from the use of an unfamiliar construction method. The materials should be selected in view of the minimum maintenance requirement and a minimum number of materials should also be used to avoid confusion on the part of local workers.

As Indonesia has no systematic regulation equivalent to the Building Standards Act in Japan, construction is currently regulated by municipal regulations. A construction approval application for an ordinary building is submitted to the Directorate of Construction (TATAKOTA) in each city for building and structural examination. The application fee is as high as 1.5% of the total construction cost. Since any building of the School is regarded as a public building, construction permission and approval by the Department of Public Works is required. The building examination, however, is conducted by the TATAKOTA.

The regulations issued by the Department of Public Works act as construction standards for materials, structural calculations for wood, RC and steel-frame buildings, construction work, live load and external force, etc. A number of technical reference books concerning RC buildings in particular have been published. In terms of structural calculations, particular attention should be paid to those aspects which are affected by the local conditions, such as the live load, wind pressure and seismic force. As these values are generally one half or one quarter of those in Japan, the construction cost is accordingly affected.

Since a cement plant is located some 45 km to the north-east of Ujung Pandang, cement is easily obtainable. With regard to the aggregate, high quality sand and gravel also appears to be available. Reinforcing rods are produced at the Kuratata Iron Works in West Java and the use of these domestically produced products is required by law. While H beams are not produced as drawn products, rolled steel is welded to make H beams. Those steel products and processed steel frames which are not manufactured in Indonesia may be imported upon application to the Directorate of Central Purchasing for permission. Importation is made through an agent of the Derectorate and a commission fee of 2.5% is levied.

Such secondary concrete products as precast terrazo tiles (300 mm x 300 mm), PC tiles (200 mm x 200 mm x 200 mm) are available as floor materials. However, concrete blocks, concrete piles and U-shape concrete blocks are unavailable. When these products are required, the concrete is cast on-the-spot upon receipt of the drawing. Windows and doors are generally made of wood. Various types of aluminium windows and doors, such as horizontal sliding, pivot, casement and outward projecting windows and swing doors are available, some in a variety of colours. Steel products, however, are not generally manufactured in Indonesia and although steel doors can be manufactured to order, they are not commonly used. In view of the fact that steel doors and windows are

quickly corroded by salt, their use in the School is not recommended. The use of hard wood, which is plentiful in the area, is recommended as the material for doors and windows in view of its durability and cost.

Some construction materials for common use are imported from Japan and Europe. Nevertheless, most materials, excepting those for special purposes, can be obtained locally if not too much stress is placed on the quality. All electric equipment, including wires, lamps, switchings and pipes, etc. and all water supply/discharge equipment can also be obtained locally. In short, all the building equipment and materials are available locally as either domestically produced or imported products except those for special purposes. An example of the exceptions is the electricity distribution board. As these should be newly manufactured, the manufacture of some of them in Japan may prove preferable in terms of quality and cost.

The building specifications for an ordinary classroom may be applied to the training workshop. As a result, no special construction materials are required, suggesting the satisfactory completion of the building by the skillful use of local materials.

4-4-2 *Distribution of Construction Work*

The following work will be assigned to the Japanese and Indonesian sides in the implementation of the Project.

Japanese Side

* Work relating to the construction of the training workshop.
* Work relating to the construction of the jetty.
* Road paving work for cutter transportation.
* Installation of educational equipment.
* Electrical work relating to the construction of the training workshop and the supply of power to the equipment.

Indonesian Side

* Work relating to the provision of a garden, plants and wall and street lamps.
* Provision of furniture and ornaments.
* Work relating to the provision of telephone facilities and wiring.
* Work relating to the drainage facility.
* Work relating to the removal and dismantling of underground obstacles.
* Application for the permission or approval required for the implementation of the Project.
* Application for the tax exemption of Project-related items.

4-4-3 Maintenance and Management Plan

The introduction of adequate maintenance measures for the equipment and facilities provided by the Project will be required at the place of use, i.e. the Ujung Pandang Rating School, in view of the proper maintenance of the functions and performance and to effect the effecient utilisation for educational and training purposes.

(1) With regard to the handling and maintenance of the equipment, Japanese service engineers will complete the training of the School's instructors prior to the transfer of the equipment ownership to the School so that these instructors may smoothly conduct their instruction assignments.

The equipment will be used in accordance with the curricula and regular checks will be carried out by the instructors to